
DETERIORATION OF LIBRARY DOCUMENTS AND SOME PREVENTIVE MEASURES

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Abstract

In this digital era, all the information are transferred from traditional print format to electronic format due to innovations of emerging technologies. Even though, majority of the libraries are acquainted with more collection of printed format compared to electronic format. These printed collections are in paper media. Since these paper media of information have more deterioration influence, they have to be preserved for future reference and for future authentication. This study aims to discuss the various forms of deterioration on library documents, factors influencing deterioration on books. This paper also suggested some methods to prevent this deterioration of information documents in libraries.

KEYWORDS:

Deterioration of documents, Conservation, Preservation, Conservation methods.

INTRODUCTION:

Books, Manuscripts and records are inscribed format belonging to a government, a company or of libraries. Printed or paper-format of memory should be kept in its Archival system for long-term usage. There are various measures adopted to arrest the process of decay by controlling and eradicating the environmental and accidental factors, which have deteriorating-influence on the documents. The main constituent of archival and library collection is paper which is being organic in nature is inherently perishable. Paper invented by Ta Si Lun in china in the year of 1798. Quality of the paper depends on the content of fibre. Since the paper media of any information document have more influence of deterioration, the preservation plays vital role. The Preservation is a process which is to prevent, stop or retard the process of deterioration. It also aims conservation.

Physical and chemical methods of treatment are adopted for conservation of books, manuscripts and other documents. Non-invasive techniques are preferred as a means of preserving the documents in their original conditions. Conservators are those who are educated, trained and experienced candidate in such procedures. Northeast Document Conservation Center is the organization, which specializes in the protection and rehabilitation of printed and photographic materials.

Most of the manuscript libraries, museums and archives having the vast collection of palm-leaf manuscripts which are dealing with meditation, Vedic hymns, astrology and the praise of gods belong to the 11th and 12th century AD.

Our country has a very rich heritage of murals including cave paintings; rock-cut caves and ancient monuments are embellished with mural paintings. The Archaeological survey of India is responsible for the presentation of this ancient heritage of India. These paintings, murals and pigments have been examined and the specimens of plaster have been analyzed.

Libraries cannot be equated with rock-cut paintings and pigments. But, the development, growth, and the accumulation of knowledge forced them to consider conservation technique. Hence, efforts of the scientists and conservators are resorted for implementing the above programme.

AIMS AND OBJECTIVES OF THE STUDY

1. It aims to discuss the nature of deteriorations on information documents.
2. It aims to discuss the problem of conservation of books, manuscripts, maps, charts and other library materials.
3. It aims to have healthy binding of materials and conservator.
4. It helps to develop better conservation practices.
5. It also discusses some preventive measures used for deteriorations.

The conservation of original document has multi-faceted dimensions such as,

1. It needs usage of materials.
2. Legislative guidance and policies at national and international level.
3. Selection procedure for documents requiring conservation.
4. Policy with regard to allocation of library for conservation.

FACTORS CONTRIBUTING FOR THE DETERIORATION OF DOCUMENT

i. Internal Factors:

The process of manufacture of paper, which is the raw material also, has a great bearing on permanency of paper. In addition the content of fibre, lignin and pulp also has a bearing on the process of manufacturing the paper. Pulping involves both chemical and mechanical methods. By chemical process the paper will become strong. But in mechanical process, the paper will become weak. The following picture (Figure No.1) depict that the book damaged due to the materials used in manufacturing.

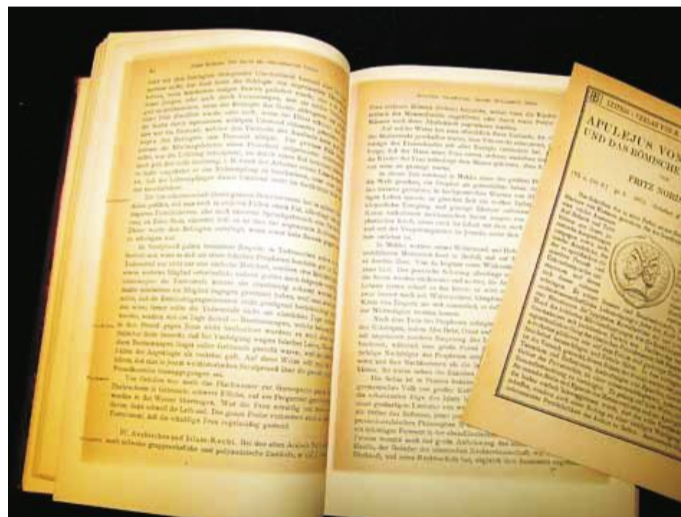


Fig.1 Book damaged due to manufacturing defect.

ii. External Factors:

Light, Heat and Moisture are the physical agents responsible for the deterioration to library materials. Light is the rich source of energy, which brings physical and chemical changes which leads to fading of ink and colors.

The change in temperature will affect the physical properties of paper to some extent. High temperature leads to yellowing and dehydration of stationeries. Low temperature retards the process of ageing. Due to climate (temperature and humidity) changes how the book damaged is shown in following figure no.2.



Fig No.2 Leather bound book damaged due to changes in climate and suffered by red rot

iii. Chemical Factors

1. The particles like dust, soot and smoke are also causes for deterioration and these particles can only be seen through electron microscope.
2. Harmful gases like sulphur-di-oxide also contribute deterioration. Because the sulphur-di-oxide emitted in the atmosphere from coal, residual oil, metallic ore industries etc reacts with water vapor in the atmosphere forms sulphuric-acid. This sulphuric-acid is arch enemy of archival records.
3. Ozone is a powerful oxidizing agent and is capable of destroying all cellulosic materials.

iv. Biological Factors

Microbes, insects, termites, rodents are major biological agents which causes the deterioration in library materials are detailed below,

The mildew and fungus included in the microscopic organisms are known as microbes. It will be evident that the cellulosic materials providing very good medium for the growth of these microbes.

The preference of food materials in the form of cellulose, glue, and gelatin will attract the insects and termites, which prefer warm, dark, damp and unventilated places.

The common insects attacking the documentary materials are,

Cockroaches: These insects are attracted by sweet and starchy material, which is in the starch adhesive used for binding is depicted in the following figure no. 3.



Fig No. 3 Cockroach damage to Book

b. Silverfish: These are small and silver in colour. They are slippery and move very fast, which grow in hot and humid conditions and feed on pulp, gelatin, and flour pasted paper, is shown in the following figure no. 4.

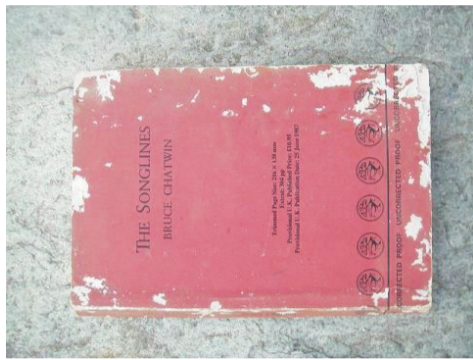


Fig No. 4 Silverfish damage to Book

c. Bookworm beetles: The Indian bookworm beetles attack the paper and palm-leaf to a great extent is depicted in figure no. 5

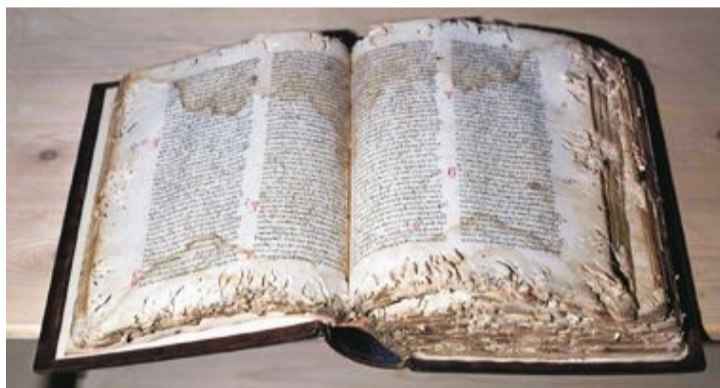


Fig No. 5 Bookworm beetle damage to Book

d. Termites: These are also known as White ants, which are all soft-bodied insects. They are entered into the material by ground or through walls to have colonies and are detected when considerable damage has already been done. These termites are thriving in high humidity area and feed on cellulosic materials as papers, manuscripts and other documentary materials. The below figure no. 6 shown the termite damage to books.



Fig No. 6 Termite damage to Book

v. Human Factors

Human beings are one of the biggest enemies of documents who damage the documents advertantly or inadvertantly. They harm the documents by theft, mishandling and vandalism. The damage of books due to improper handling, slumping and vandalism are shown in the following figures numbers 7, 8 and 9.



Fig No. 7 Book damaged due to Improper handling



Fig No. 8 Books are in bad condition due to Slumping position

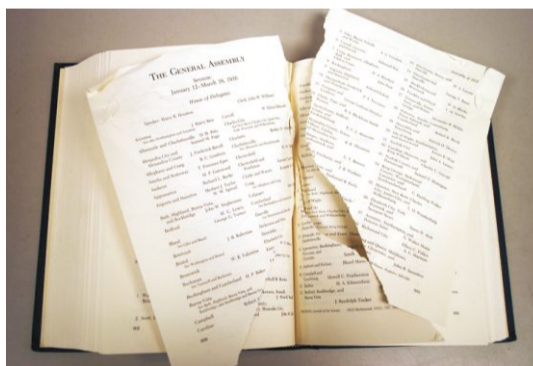


Fig No. 9 Book damaged due to Vandalism

PREVENTIVE METHODS OF CONSERVATION**I. Basic Standards for Building Construction**

1. The Library documents are to be kept in a place, which is least affected by deterioration agents. The repository area must be neat and clean.

2. Maintenance of proper storage conditions enhances the life of collection.
3. Insecticide solutions must be sprayed in the repository area.
4. Metal racks are preferred to wooden racks to keep the documents.
5. Metal racks must be painted with rust proof material.
6. Non-use of any collections leads to deteriorate them.

II. Methods of Conservation

The library documents are to be examined to observe the extent of damage to documents and to understand the components that deteriorate the documents. It will be evident that photocopy of the damaged documents may be taken prior to their repair. Conservation of document is very costly. But one copy of the original document can be protected for reference and authenticity as a national interest. The preventive methods of conservation include removal of stains, insects, fungus, termites and control of acid deterioration in paper. The following steps may be followed towards conservation of documents in the repository or in the library,

i. Environmental Control

The repository area of library documents should be free from dust, dirt, air pollution, moisture and extreme weather of hot & cold.

ii. Cleaning and Stain Removal

Prior to repair of damaged documents in library, they are to be cleaned to remove the dust and dirt by using vacuum cleaner. Soiled documents should be cleaned by using non-aqueous solvents like petroleum ether, chloroform etc. Even though, there are so many chemicals are available, some specific chemicals should be used for deterioration methods.

The solvents commonly used to remove the stains are mentioned in the following table no. 1

Table No.1 Stains Vs Solvents

Sl.No	STAINS	SOLVENTS
1	Tea, Coffee	Potassium Perforate
2	Ink	Oxalic acid
3	Mud	Water, Ammonia
4	Oil, Fat, Tar	Pyridine, Benzene
5	Carboxymethyl Cellulose Paste	Warm Water
6	Mildew	Ethyl –Alcohol
7	Grease	Citric-Acid or Petrol

During the removal of stains, the nature of environmental condition and the quality of paper must also be ascertained.

iii. Fixing of Ink

When we use the soluble ink or colour to fix the water painting picture ink should be fixed prior to aqueous deacidification. To fix that picture, 2% Poly-Vinyl-Alcohol or Poly-Vinyl-Acetate in tilune should be applied on the surface of the painting.

iv. Deacidification Process

It is classified as follows.

1. Aqueous Deacidification: When the water-resistant writing ink occurs in the document it is immersed in the aqueous solution to neutralize their acidity. This process is called Aqueous –Deacidification.

2. Non-Aqueous Deacidification: This method is used only when the document contains water-soluble ink. The commonly used Non-Aqueous solutions are,

i. 2% Magnesium-Acetate in 95% Spirit.

ii. 2% Barium-hydroxide in Methanol.

3. Gaseous Deacidification: Gases like 10% Ammonia and other vapors are also used for Deacidification of documents. This process of Gaseous Deacidification will enhance the PH value of document.

4. Mass Deacidification: Mass Deacidification is nothing but several hundreds of volumes of library collections are to be treated at the same time for deacidification by using chemicals like Cyclohexylamine-Carbonate which enhance the PH value of document.

v. Lamination Process

The damaged library materials or documents should be paginated first. Then the documents are to be sandwiched between sheets of tissue paper and Cellulose Acetate foil and it is sealed under high temperature and pressure.

Recently, the National Archives of India developed a new technique of lamination without heat and pressure is known as Hand Lamination or Thermoplastic Lamination Process.

For delaminating, the laminated document immersed in acetone. This acetone solvent dissolves the Cellulose acetate and removes.

vi. Cleaning of Parchment

It is very simple method in which the parchment rubbed with the pad of moisturized cotton swap and then dried. Fresh Onion Juice can also be used for cleaning the parchment.

vii. Fumigation

Fumigation is modern method of conservation of library documents. Most of the libraries and repositories are using this method nowadays. In this method, the library documents are to be exposed to fumes or vapors of toxic chemicals, and they are subjected to keep for sufficient time period to decay the infestation. There are two types of fumigation.

1. Airtight Chambers: In which, the documents are kept in closed environment with chemicals like Naphthalene, Para-dichloride-benzene and Methyl bromide.

2. Vacuum Fumigation: A large collection of documents is fumigated in vacuum is a small chamber for which Ethoxide mixture is used. This method destroys eggs, larvae. This Ethoxide mixture is nothing but combination of Ethylene Oxide and Carbon dioxide.

CONCLUSION

Conservation of damaged library documents or materials plays major role in the field of library and repository areas. Because, most of the libraries are acquainted with collections in the printed format than that of electronic format.

RECOMMENDATIONS

1. Library and Information Professionals should be given due training to enhance their knowledge on conservation of library documents by attending seminars, conferences and workshops.
2. Periodical inspection of books and materials.
3. Duplication of manuscripts in electronic media.
4. Bringing all libraries in a network by which exchanging views on conservation techniques.
5. Giving awards and prizes to libraries, which we adopting best conservation techniques either at state level or national level.

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