

Soiling on Traditional and Historical Textiles- A Glimpse on Cleaning Procedures

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ABSTRACT

This article analyzes the significance of textiles as an integral part of rich cultural heritage of India, chief fibres used in traditional antique textiles of museum and the soiling on traditional antique textiles. Soiling can be classified according to its source, potential to cause damage, and the possible methods of removal. Soiling on historical textiles may be deposited from functional use or handling, the site of excavation or recovery, air borne pollutants. Classification of soiling causes of soiling, the treatment procedures developed by conservators, various types of methods of cleaning textiles ranges from mechanical surface cleaning to wet and solvent cleaning are also discussed in this paper. Proper documentation is a mandatory step for any kind of conservation, so proper documentation system before cleaning is also cited in this article. The solvents used in textile cleaning and the limitation of wet and chemical cleaning are also mentioned in this article.

Keywords: Particulate Soiling, Dust and Dirt, Surface & Eraser Cleaning, Alcohol, Di methyl Formamide.

I. INTRODUCTION

“The past is not dead; it is living in us, and will be alive in the future which we are now helping to make.” William Morris. Indian textiles have a rich cultural history of its own and it belongs to the category of tangible cultural heritage which play an important role in Indian heritage history. The embroidery, dyeing, printing on textiles are evidences of fine craftsmanship of our ancestors. Numerous examples of historical textiles are scattered in museums and in some private collections and each of these work is bearing our affluent cultural heritage, but it is very distressing that due to lack of appropriate conservation and preservation, this legacy is facing a great jeopardy. So it is necessary to preserve and restore the textiles for our future generations to make them aware of our culture. Ancient textiles mainly found in museums comprise of usually cotton and silk as the base material. The fibre component of textiles is of fundamental importance in textile conservation. The morphology of a fibre refers to its shape, structure, surface characteristics and cross section. The mechanical, physical and chemical properties of a fibre are determined by its chemical composition, structure, morphology and technology.

II. ANALYSIS

Cotton is a natural fibre of vegetable origin, also known as a vegetable fibre. The fibres of cotton are much simpler in construction and consist of the polymer cellulose built up from cellobiose units. The pairs of glucose rings are joined together in a long chain molecule linked by valency bond. The main source of cotton in our country is the seed hair of Gossypium herbacium and Gossypium hirsutum. Silk is obtained from the cocoon of Silk worm (Bombyx mori), or tussar silk worm Antheraea mylitta (India) and Antheraea pernyi (China). The fibrils are laid parallel to the axis of the filament. The main constitutions are the proteins fibroin and sericin. Fibroin and sericin are made up from the same amino-acids as wool, but glycine, alanine, serine and tyrosine predominate.

Soiling on historical textiles can be classified in various ways. Dust and dirt may signify historical or functional information for historians, ethnographers, art historians and conservators. The documentary value of soiling is therefore assessed before removing it because cleaning is an irreversible process. It may be important to

preserve the evidence provided by certain soiling, even though the dust and dirt may be a potential threat to the long term preservation of the textile. In such cases the decisions whether remove or not to remove the soiling should be made by conservator, curator or custodian of the textile. Accumulation of dust and dirt is a common problem in textiles. Environmental pollution, improper storage, mishandling, irregular checking in storage, changes in relative humidity, acidity present in textiles are the common causes of accumulation of dust and dirt. Sharp dust particles cause not only physical abrasion but also produce chemical reaction. Dust contains acidic and metallic ions may cause degradation. Dust particles attract moisture which in turn gives rise to chemical reaction and dust also cause discolouration and disturb aesthetic appreciation.

Soiling can be classified according to its source, its potential to cause damage, and the possible methods of removal. Soiling on historical textiles may be deposited from functional use or handling, the site of excavation or recovery, air borne pollutants. During use and general handling the following types of soiling may be deposited on textile; soiling originated from wear, food, cosmetics, fats and oils, blood, skin particles, various corrosion products, water marks, dust, soot, smoke, paints, inks, adhesives and fungi. The following types of soiling may have deteriorating effect on textile fibres:

- ✓ **Solid dirt:** This cause strain and mechanical damage by friction between the fibres or yarns or embroideries.
- ✓ **Dust:** Dust may cause discolouration of textiles. It is superficial particulate matters that adhere to the textile surface.
- ✓ **Dirt containing metalions:** The corrosion products have a catalytic effect on the photodeterioration of fibres on exposure to ultraviolet radiation and light.
- ✓ Corrosion products such as inorganic salts, sulphides, oxides, carbonates, nitrates, silicates of sodium potassium, calcium, magnesium, etc results in deterioration of fibre by various chemical processes.
- ✓ **Finishes of natural origin:** Starch, gums and gelatin may cause physical damage to textiles by their relative firmness on aging. Some finishes

may become acidic on aging, resulting hydrolysis of fibres.

- ✓ **Micro-organism:** They may cause deformations of fibres by their enzymatic action and result in discolouration and staining.

Soils can be distinguished into two heads according to their form and probable source: Particulate soiling includes dust, sand, clay, and silicates, earthy materials, pigments, corrosion products, solid salts and molecular soiling refers to dirt which usually dissolves in water or in organic solvent.

A dirty textile can give offence to the senses of sight, touch and smell. Dust and dirt is acting as a catalyst and causing decay of weaken fibres and discolouration and substances such as iron hydroxide totally destroy the area of fabric on which they are deposited. Therefore cleaning is a vital conservation process to get back the deteriorated textiles in its original form. Before cleaning, documentation of the textile must be done. Proper documentation is an important part of conservation. It is a written document which states the details information and condition of the object. It is also used for maintaining a proper laboratory record for the conservation of the objects and preserved for the future so that one can understand later that how was the object in past and how it was treated at that time. In a condition report of a textile object the title of the object along with the accession number, conservation status, size, date of examination, information in accession register, material, significance, colour, embellishments, condition and deterioration found in the textile, proposed treatments and treatment given along with date, name of the conservator is also mentioned properly. Photographs of the textile must be taken properly before, during and after the treatment. Photographs are mainly taken for the physical verification of the object and to show the condition of the object. All the deterioration and symptoms found in the textile should be properly photographed. In case of textile, photograph is taken on a flat white surface and both from the front and the back. Once proper documentation has been done, the cleaning process must be started mechanically and chemically.

Surface cleaning is defined as the removal by purely mechanical means of loose dust, grit and ruffle which accumulate on exposed surfaces, in the folds and even

inside linings. There are several ways of removing this loose dirt and they are as follows:

- ✓ **Using of brush:** The aim of brushing is first to loosen dirt and then to move on one side and away from the object. A brush of suitable to the size of the object and the type of surface is chosen and the surface dust is removed mechanically.
- ✓ **Using of blower:** A small blower will reach the interstices of bead work and embroidery which can be difficult to reach by other means.
- ✓ **Using a rubber:** The best method to surface cleaning is to use a soft, synthetic vulcanized rubber or eraser. Pass the rubber lightly over the surface in short regular strokes, changing the direction from time to time.
- ✓ **Using a Vacuum cleaner:** Unregulated suction can be very dangerous. On no account must it be so strong as to be able to pick up the object and hold it against the nozzle.

The solvent and cleaning medium used in wet cleaning is water. In addition to de-ionized water washing solutions may contain surface active agents and soil suspending agents or non ionic detergent. The prepared object is sprayed out on the supporting films of Melinex as squarely and neatly as possible on the washing surface, which should be in horizontal position. The limitations of wet cleaning are as follows: Dyes may bleed and colour may change, fibres in poor condition may undergo further deterioration during wet cleaning and dimensional changes to textiles may result from swelling and shrinkage of fibres in water.

The term solvent cleaning is refer to the cleaning of textiles with organic solvents. Organic solvents can dissolve, or at least swell some types of dirt, mechanical action is often necessary to aid dirt removal. Sometimes surfactants and water are added to the organic solvents. Solvent cleaning of historical textile is considered when soiling is wax, oil, grease etc. in nature or when the bleeding of dyes or a change in dye colour, precludes wet cleaning. Solvent cleaning is also applied for decorated and embroidered textiles which may damage by water. The limitations of solvent cleaning are as follows: Creases and folds in many textiles will not be relaxed and removed by organic solvents, organic solvents may cause bleeding or colour changes of some

dyes, ink and pigments and the binding media of painted and printed textile may swell or dissolve in organic solvents. Solvents cleaning can be undertaken by immersing the textiles in the solvents or by localized application of the solvents to stains or soiling.

Some chief organic solvents for textile cleaning are discussed below:

- ✓ **Alcohol:** Methyl-alcohol ethyl-alcohol, butyl-alcohol, ethylene-glycol and glycerin are very polar solvents which are most effective for removing soiling of textiles. Alcohol solvents dissolve fats, oils, greasy dirt, shellac, waxes, and ethyl-cellulose. Alcohol is highly flammable so care must be taken while using it.
- ✓ **Ketones:** Acetone, di-acetone alcohol are the most common ketones used in cleaning textiles. Ketones dissolves waxes, some natural resin, inks, fresh oil binding media and synthetic polymers
- ✓ **Esters:** ethyl acetate, n-butyl acetate and n-amyl acetate are common ester solvents of medium polarity. They dissolve fats, oils, natural resin, some dyes and many synthetic polymers.
- ✓ **Ether:** di-ethyl ether is mostly used in textile conservation. They dissolve fats, oils, waxes, and synthetic polymers. Ethers mixed with alcohols dissolves cellulose nitrate.
- ✓ **Halogenated hydrocarbons:** Trichloro ethane, dichloro ethylene are most commonly used in textile conservation practice. These solvents dissolve grease soiling, fats, oils, wax, natural resin, rubber, poly-vinyl acetate etc.
- ✓ **Nitrogen compound:** di-methyl formamide is a very polar solvent and it dissolves oxidized natural resin, poly urethane and poly carbonate and swell epoxy resin.

III. CONCLUSION

The soiling on textiles is often due to the combination of physical, chemical and biological factors working together in polluted and humid environment with inappropriate light and temperature. Cleaning is a treatment procedure to prevent the textiles from further deterioration and provide an aesthetic look to it but the physical process of cleaning or washing textiles can

damage them. Every time a textile is washed, it suffers a degree of loss as broken or loose fibres are rinsed away, so proper care should be taken while cleaning historical textiles. The vacuum cleaning is the best way to clean the surface soiling of textiles. After determination of cleaning process the Linings and backing should also be removed, vacuumed, and washed separately. This is not only to prevent colour bleeding, but to avoid trapping dirt between the layers, which may cause discolouration from the inside. Additionally, different fibres react to cleaning in different ways, and fabrics may shrink or stretch, which, if they are still attached together, may cause rippling and distortion in the lining and outer layer of the textile. Textile has a rich past of cultural heritage so it is the moral duty of the museum professionals, conservators and common men to keep it safe for future generations to make them aware of our culture.

IV. REFERENCES

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