

Conservation Issues Related to Numismatics Collections– A Brief Study

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Abstract: *This article looks at the numismatics collection housed in museums and attempts to define various concerns that factor in their deterioration. Numismatics collections provide one of the most fascinating contexts of studying history and are a valued source in gaining insights into the bygone eras. While metal objects are considered relatively stable however, they are prone to corrosion and deterioration when exposed to extreme humidity levels, acidic vapours, pollutants and chemically unstable materials. This article discusses various factors that should be considered while deciding on the display and storage materials where these objects are eventually going to be housed in a museum. The preventive care that these objects require can help in arresting their dissolution and preserve them for the next generation.*

Keywords: Preventive Conservation, Coins, Museum Storage, Handling

I. INTRODUCTION

Coins are one of the most prolific objects that are found across the world and are housed in museums and private collections. They are valued and collected by museums with historical collection as well as by a hobbyist collector. In terms of material evidence, they are an important source of economic, political and social history. In fact, for some of dynasties they are the only source of information that we have (Sircar, 1968). They also provide a window to the scientific knowledge of metallurgy and metal casting that was known by the people during the different times these coins were made.

Most often these coins were either lost or deliberately hidden at the time and were later discovered in active exploration like an archaeological dig or through chance discoveries during construction or excavation work on sites and buildings. This brings us to note one of the most determinant factors that decides the rate of deterioration for these objects. The condition of the soil or space from which these coins have been discovered and the duration of their exposure to the space would play a major role in the eventual survivability of these coins.

It is also necessary to acknowledge that despite the coins being made of metal, like all materials they are eventually fated to fade into oblivion. Metals, with the exception of noble metals, are prone to corrosion: iron rusts, copper turns green, silver turns black and lead disintegrates into white powder. If objects are stored improperly will slowly transform into oxides, sulphides, carbonates, or other compounds. If the metal surfaces are contaminated by salts, volatile organic acids, exposed to ammonia from cleaning fluids, or dust, then this deterioration process will be faster (Selwyn, 2004). The rate of this deterioration is dependent upon many factors but the two most crucial ones. The first being the material composition of the coins when they were being minted. Objects made of metal like coins are by their nature imbalanced as in they have a tendency to turn back into their mineral form from which they are extracted and refined (Hoge, 1996). This tendency is further decided by the factors like the condition of the space from where they were found, the duration of the exposure or timespan, environmental conditions, humidity and temperature, electrochemical composition of the space etc (Hoge, 1996). As in when these coins were made, they were created for circulation and to be handled, which often leaves its own imprint of degradation and loss in finer details. But these layers of time and usage is what gives them their uniqueness and are also needs to be protected along with the object.

By the time these coins are unearthed or reach a museum they have already undergone exposure of varying degrees that can have a lasting impact on their rate of inevitable deterioration. These factors will determine all concerns regarding

the conservation treatment of the object, its handling, storage, display, its susceptibility to humidity, temperature and deterioration.

II. RELATIVE HUMIDITY

Relative Humidity is one of the most important factors in accelerating deterioration of metal objects like coins. The ideal RH levels that are recommended for museums is to keep it stable between 35% to 55%. It is recommended to first monitor the storage conditions of the objects and assess whether the objects should be stored in controlled RH facilities. Relative Humidity levels when they rise above the recommended levels can contribute to the various deteriorating agents and accelerate chemical reactions that can increase the rate of deterioration. It is recommended to use humidity inhibitors like ArtSorb, conditioned Silica Gels, dehumidifiers etc. It is also necessary to constantly monitor these inhibitors as they require to be reconditioned and monitored to be really effective.

III. STORAGE OF ACTIVELY CORRODING (UNSTABLE) METAL OBJECTS

Needless to say, that monitoring of the collection should also be based on the awareness of the collection and the curatorial staff should be aware of signs when an object shows active corrosion. It is absolutely necessary to separate such objects from the rest of the collections and should be stored in a separate area with RH levels below 35% as this would reduce the rate of reactions to a considerable degree. (Stone, CCI Notes 9/2, 2007).

IV. STORAGE AND CARE OF SPECIFIC METALS

Copper objects

Copper is one of the metals widely used as base metal for the coins. Copper and its alloys are very prone to corrosion when exposed to ammonia, acids, strong alkalis, chlorides, and sulphide gases. It is advisable to store these coins in acid-free unbuffered paper or pH neutral boards. One of the most common deteriorations observed in copper objects is the bronze disease which is an eruption of light-green powder observed in spots on the surface. When such an action is observed, it is imperative to separate them from the rest of the artifacts. Objects affected by bronze disease should be kept in RH levels below 35% and further course of action should be taken up by a trained conservator. Please note that this falls under curative action and objects affected by bronze disease should be treated at the earliest to arrest further deterioration.

Iron objects

Iron is susceptible to rust when it receives humidity levels above 65%. Iron objects especially the ones found from archaeological digs should be treated before being considered stable for storage as they are bound to be contaminated with salts.

Lead objects

Lead is a common material found in coins. It is a difficult object to store safely as its tendency to react even in the presence of small amounts of volatile organic acids. These acids like acetic or formic acid easily corrodes the objects and weakens it. Formaldehyde released from the adhesives used in certain plywood and particle boards is a great contributor to formic acid. This brings into question the use of such materials while preparing the storage containers, display cases. It is again good practice to wrap the objects with neutral and acid-free materials and store them in conservation grade storage solutions.

Silver objects

Silver is again a common metal used in coins and was a preferred metal since the earliest times. Deterioration in silver is often observed as blackening called Tarnishing and is caused by sulphur-containing gases, such as hydrogen sulphide. One significant contributor of this is the exposure of objects to air pollutants, exposure to synthetic rubber, certain paints, and some textiles (e.g. wool or felt). It is advisable to store and display them in closed and sealed environments as much as possible and regularly monitor them.

V. CONSIDERATIONS: BEFORE INITIATING CONSERVATION INTERVENTION

Before conservation plans are conceptualised there are certain parameters that are kept in mind and above all else of that is to stabilise the objects. By stabilisation what is meant is to make the object being able to withstand the handling, able to withstand conservation treatment, its transportation, display or storage. The conservation ethics also requires that all treatment methods should be reversible in order for future conservation intervention if required be possible without damaging the object. Any intervention or treatment cannot alter the very nature or elements of the object. Sometimes the objects like in coins are bound to have layers of historical context like abrasion or smudging of details which are essentially part of its historical journey. The object is never relegated to some total of its materiality but its complete historical, cultural context as its essential part of it that also must be preserved.

A major factor that is often overlooked is the impact of the pollution which is ever present in our environment especially in the urban areas. Pollution which is a combination of harmful compounds, dust particulates, when combined with fluctuating levels of humidity and temperature can severely deteriorate metal objects too. Various compounds like sulphur oxides and chlorides can have a corrosive effect on copper and iron objects. Silver is especially affected by hydrogen sulphide (Lykiardopoulou, 1997). Bronze disease is one very common problem that is observed in museum objects and requires active curative measures to treat. Suspended particles which are a combination of dust, grit, soot can settle on objects and aid in their deterioration. Pollution can even occur from the materials used in the construction of showcases or storage cupboards. Materials containing volatile sulphur compounds can have a detrimental impact on the tarnishing of silver and bronze coins. They also react and cause acid vapours to form around certain metals especially containing lead and zinc (Lykiardopoulou, 1997). These sources of pollution can be found in the wood, plywood, various adhesives and dyes, textiles etc. This often-overlooked aspect is found to be one of the major contributors of object deterioration in museums. It is therefore, advisable to adopt testing of materials in advance for their suitability to be used around objects as a standard practice and avoid the use of the materials that have been known to be harmful altogether.

Handling

Although it has been known for a very long time that objects should be always handled with care and should not be in direct skin contact as this can transfer epidermal residue and fat that is always present in our hands. It is always advisable to use clean cotton gloves and to always place the object on a stable surface. The coins should be held from their sides. Objects such as silver and copper are particularly sensitive to oils and salts present in our skin. Also, care should be given to avoid latex rubber gloves while handling silver objects as this can bring it in contact with sulphur compounds that can eventually tarnish them (Stone, Basic Care of Coins, Medals and Medallion Art – Canadian Conservation Institute (CCI) Notes 9/4, 2007).

Storage

Storage of museum objects is of one the most crucial importance and can largely impact the state of the objects in the long term. Ideally the collection should be a well-ventilated room with proper air ventilation in place. This is necessary as proper air circulation will minimise the chances of build-up of corrosive gases, such as volatile acidic or alkaline vapours.

Storage Holders

All coins should be stored individually in protective holders. They should not be stacked on top of each other under any circumstances nor it should be kept in bundles where they can damage each other's surfaces through rubbing or friction. While choosing a folder care should be given to choose materials that do not cause deterioration of the coins through off gassing or by actively contributing acid formation on the objects. They should be ideally chemically inert and non-reactive.

Traditionally, plastic flips and paper envelopes have been used for housing these collections. Flips have two pockets: one for the coin and one for curatorial information. Paper envelopes should be made of good-quality, acid-free rag paper. Plastic folders are preferred as they minimize handling but they should be made from an inert, pure, archival-quality plastic such as polyethylene, polypropylene, poly(ethylene terephthalate) (e.g. Mylar, Deskor), polystyrene, or

poly(methyl methacrylate) (e.g. Plexiglas)(Stone, Basic Care of Coins, Medals and Medallion Art – Canadian Conservation Institute (CCI) Notes 9/4, 2007). Sometimes cardboard is used for shelving, however, they are acidic, and therefore Mylar can be used as a barrier between the coin and the cardboard.

Archaeological coins are often too fragile to be housed in Mylar holders or flips. Instead, it is recommended that they be housed in small polystyrene boxes, within which they are mounted on custom-carved polyethylene foam (e.g. Ethafoam) mounts that have been lined with a soft, non-abrasive material such as cotton jersey.

Storage Cabinets

Wood has been a preferred material for storage cabinets due to its aesthetic appeal and workability however they are not advisable. Wooden cabinets can emit acidic vapours that can aid in the deterioration of coins. If unavoidable then coins should be provided a layer of acid free barriers like Mylar holders. Care should be given to avoid certain type of wood like Oak altogether as they have been known to cause acidic reactions on metal objects. Inert plastic containers such as polyethylene or polystyrene or metal storage cabinets — ideally ones that have a powder coating are the preferred materials instead.

Exhibit Cases

Exhibit cases, like storage containers, should be constructed of stable, non-deleterious materials. Any lining fabrics, especially those in direct contact with coins, medals, or medallion art, should meet the same criteria(Tetreault, 1992). Ideally, all materials destined for the interior of an exhibit case should be tested to ensure that they are not potentially corrosive(L.R. Green, 1995).

Security

Exhibit and storage security are particularly important for coins, as these objects tend to be small, valuable, and exceedingly portable. Exhibit cases and storage cabinets should always be locked, and access to the keys should be limited. (Stone, Basic Care of Coins, Medals and Medallion Art – Canadian Conservation Institute (CCI) Notes 9/4, 2007)]

VI. CONCLUSION

Care and preservation of museum objects is an essential aspect of museum profession. In this certain parameter, if taken care of can help in the long-term. The basic understanding is to provide proper storage conditions and ensuring good housekeeping which can be of the greatest help against factors of deterioration. Certain conditions like care in providing regulated Relative Humidity and temperature levels, use of non-volatile and inert materials while designing storage solutions, care in handling, transportation and display are of utmost importance. Conservation is to be last resort for the objects and preventive care can mitigate the need for active intervention to a great extent. Care in choosing display and storage materials, ensuring proper circulation of air in the space around objects, mitigating the effects of pollution and dust, regular inspection and photo documentation of the objects from time to time are some of the essential ways in which museums can ensure the objects are kept safe. Providing safety to the objects from theft is another very crucial point to be considered especially for such small objects like coins, for this motion detector alarms and cameras can be employed.

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