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CONSERVATION RULES FOR COINS AND MEDALS

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INTRODUCTION

Rules. We make them, we break them, we follow them, we ignore them, we amend them, we abolish them. Are there - and if there are, need there be - rules which we can lay down, and to which we can and should adhere, for the conservation of coins and medals or, really, of any other such cultural materials?

Truly, I prefer the French title of my discourse, "Lignes de conduite pour la conservation des pièces de monnaies et des médailles", because it seems to imply guidelines, methods or procedures more than does the English term rules. I think there are many, sometimes differing, approaches to the care of these small objects, and even legitimate philosophical differences regarding concepts of conservation science itself. Rules seems a bit presumptuous to me in view of our present rather limited, but rapidly developing, knowledge in this field.

There are, however, some tenets that all of us can easily accept, I believe. Today I will review these common concerns and some of the measures that have been or may be taken to address them. What I would like to initiate is a framework for discussion and shared information leading, eventually, to a comfort zone, if not an absolute consensus, of conservation practices throughout all museums with numismatic collections. All of us have gained valuable insights in the course of our work with numismatic items. To pool this information into a coherent body of data someday will be very helpful to us all.

THE DETERIORATION PROCESS

Coins, medals and tokens, in common with most other kinds of artifacts, inevitably deteriorate over time. Their substance, generally refined metal of some sort, is naturally in a state of imbalance, tending to return to a mineralized form and structure. The rate at which the breakdown occurs depends upon the substances themselves, their ambient environments, and the factor of time involved. Substance and environment can of course undergo transformation, and even time has to be considered relative, so we can and must anticipate change of status and rate of decomposition.

Few, indeed, are those coins of the past found today in pristine mint condition. Entropy, in one form or another, takes its toll. Originally these pieces were intended to be handled, to circulate, so routine usage will often have degraded or obliterated fine details which render them of interest to numismatists and other students. Nearly all of the older coins and related

items in our collections today were either lost or intentionally concealed in locales where exposure to various different sub-terranean environments determined the rate, quality and specific nature of their deterioration. Thus, a constantly adjusting micro-environment of electrochemical factors has been brought to bear upon our surviving coins. Upon being discovered or unearthed, the pieces have become subject once again to a new set of factors and circumstances which may retard or accelerate their passage to oblivion.

Temperature, humidity, abrasion, duration of exposure, the internal and external elements present and shifts in all of these possibilities, then, are the controlling factors in determining the state in which we encounter our specimens today. And they are also the essential concerns for us to address in our ongoing conservation efforts in all of our cabinets. While the results of these combined factors cannot actually be reversed, their action can be arrested or reduced. Often the apparent deterioration can be mitigated and the pieces themselves stabilized for relatively long periods of time.

A PHILOSOPHY OF STABILIZATION

If we may, then let us address both the what and the how of conserving coins and medals in the modern museum environment. There are several very important and overlapping considerations for items in such collections. (In general, too, pertinent guidelines for other sorts of objects are useful for numismatics). Those specific areas that I would like to review are handling, storage, security, exhibition, cleaning, restoration and catastrophe: in other words, the exposures to which the specimens are subject. We note that these issues are quite distinct from those having to do with collecting, classifying, elucidating or interpreting the specimens. We note as well that we are not addressing the philosophical bases of these other crucial concerns.

Stabilization should be our primary goal or rule for conservation ... not in the sense, necessarily, of actively doing something to the specimen but prolonging and reinforcing whatever may be the best attributes of its present state. This would also imply controlling, retarding or even eliminating what might be considered the worst aspects of the object's current status. If I may explain ... Stabilization means to consolidate the object materially and environmentally in such a way that ongoing electrochemical reactions and concomitant physical changes are nullified or greatly reduced. So, what we could say is that we wish to protect and enhance the integrity of the specimen. The object that appears to be sturdy, fully informative, deteriorating only very slowly and well-suited to its normal environment could ideally be maintained in almost precisely this condition as long as possible with adequate controls. On the other hand, many pieces will show the results of potentially very destructive circumstances, and various practical steps must be taken to insure that the piece remains a

museum specimen, and does not become simply a useless glob of metalliferous grit.

Our specific areas of concern - handling, storage, security, exhibition, cleaning, restoration and catastrophe - can all have different ramifications depending upon the physical integrity of the object. In some museum collections - and here, frankly, I am speaking for the most part generally of those museums in which numismatic components are not considered to be a significant part of their purpose or holdings - coins and medals are given little if any care. They are frequently, in the United States, at least, considered to be liabilities - but liabilities of a sort which might perhaps be handily deaccessioned and sold to generate revenues for other, ostensibly more germane, acquisitions or programs. Lack of appreciation or misunderstanding of their roles in civilization, and of their nature as artifacts, can cause coins, medals or tokens to be neglected. This can lead to rapid deterioration and damage, even destruction or loss.

HANDLING

Obviously, the less handling to which an object is exposed, the better, as far as its conservation is concerned. We want our specimens to come into as little contact with human skin, or any other potentially corrosive or abrasive substance, as possible. When necessary, we know to hold the coin by its edges, for the most part. (Here, some general pragmatism must prevail, though: the surface of an ancient gold piece, of nearly pure composition, will be damaged far less by having its surfaces touched, or even - gasp! - by exposure to human flesh, than it will by plummeting into contact with a hard object when dropped by not-so-nimble fingers).

As a rule, the use of clean, cotton gloves is advisable for holding coins when they must be handled. The fatty acids in the oil of human epidermis can be easily deposited upon an object. In fact, they will be deposited in some minute amounts unless appropriate care is taken. Suitable padded surfaces below the viewing area can also help to reduce damage due to lack of hominid dexterity.

STORAGE

Luckily for us, and for my topic today, metals are relatively insensitive to potential damage from light sources. Ideal storage conditions need not involve some of the considerations important for more perishable objects. However, it is essential to remember that various numismatically related components, such as pendant ribbons or original presentation cases, will require a higher level of care. Proper storage of most numismatic collections involves protection from handling or abrasion, from temperature extremes, from humidity, and particularly from the potential physical or electrochemical effects of ancillary storage or packaging materials. Whether standing vertically in small paper or plastic envelopes, or lying horizontally

in trays or drawers, perhaps supported on small pads of some kind, motion can cause some abrading of the surfaces or areas of highest relief.

When these or any other conventional storage methods are used, it is extremely important that the packaging and supportive materials be chemically inert - specifically, that they be as acid-free as possible. Clear plastic envelopes, or flips may keep the specimen from moving as much, but they too impart a degree of friction when the piece is inserted into or removed from its protective holder. Also, the plastic envelopes may trap moisture, or attract airborne particulate matter, both of which can contribute to electrochemical decomposition. Some plastics themselves are composed of quite deleterious materials, such as the polyvinyl chloride which has been in popular use by coin collectors and dealers for some 35 years.

All materials composing the storage environment should be evaluated for their contamination potential. Certain paints, enamels, fabrics, adhesives, woods, and other substances can off-gas, and create acidic or toxic environments; some materials will shed a residue of particles; some are perversely hygroscopic; any contain sulphur compounds.

For metals, relative humidity should ideally be kept as low as possible. However, recent thinking in conservation circles contends that an RH appropriate for mixed collections (that is, from 35% to 55%) is probably acceptably safe. Due to their typical characteristics as small, easily transportable and sometimes highly valuable artifacts, numismatic items also require relatively high security hardware, in addition to humidity control apparatus, for adequate protection.

Having had the opportunity to visit a number of numismatic collections around the world, I can assure you that there is no uniformity or consensus on just what constitutes the best form of storage hardware. Eventually, perhaps we can compile statistics on products, on usage, and opinions, regarding the various types of cabinetry one finds employed in the museums and collections of money and banking. This is an area of special interest to me, and I invite all of you to share your thoughts.

SECURITY

I have mentioned security in the context of storage considerations. All of our conservation concerns are really inter-related, but basic security is of over-riding importance. If our collections cannot be kept for posterity, it may not matter so much in what kind of condition they are frittered away. Protection requires structural soundness for the facilities wherever the specimens are housed, whether in storage, on exhibition, under investigation or analysis, or undergoing some other form of handling. It also requires diligent surveillance and monitoring on the part of all those of us whose mission is to provide stewardship for the collections. Today, the

wonders of technology provide us with a fine array of electronic gadgetry for surveillance and alarm systems, but appropriate facilities and hardware - and alert, dedicated personnel - are the foremost defence against both marauding hoodlums and touring groups of American students. (Wait a minute ... are these the same thing?..).

A vital, but perhaps not always thoroughly recognized part of security procedures is the accuracy and completeness of documentation and accession records maintained in the museum. Identifying, cataloguing, photographing and evaluating are critical tools for insuring the well-being of our little roundels, and the basis for potential action following any breach in security systems.

EXHIBITION

Our considerations for exhibition purposes... Do you think all museum personnel are sometimes accused of being exhibitionists? ... are actually very much the same as those for storage, aesthetics aside ... Conservation safeguards are essentially the same as those for any other class of relatively imperishable object. I have appended to this discussion a set of design stipulations for construction of cases or vitrines in which metal objects are to be displayed. This is courtesy of master conservator Andrew Linz, who was my instructor in course work on the conservation of metal objects at the Campbell Center for Preservation Studies.

CLEANING

Cleaning is probably the most controversial aspect in our conservation concerns. Possibly, though, the controversy lies in our definition of cleaning. For dictionary purposes, we could say this is "to make or become free from dirt or disease", and few would argue with the keeping our specimens in conditions under which they display no disfigurement and look healthy. The problem can arise from the degree to which we may want to excise the dirt or disease.

There are of course those who feel that pieces should be cleaned little if at all. Many times associated soils, encrustations, corrosion by-products or contiguous fibres can reveal valuable information about the configuration of the deposition from which the coins came, and other culturally significant details regarding that time, place or set of circumstances. But these kinds of data are clearly of no great value if the coins themselves are not in a condition to provide numismatic insights.

So we may well suppose the cleaning controversy is primarily a question of degree. Surely it is of some interest to be able to form an idea of what the coin or medal originally looked like. Some items might simply need to have their mantle of dirt carefully removed and show themselves in their native glory. With some pieces this is entirely possible - with many well-preserved

gold pieces for instance. Bronze and other copper-alloyed or copper pieces, to the contrary, just will not survive for long in original mint state; we can slow their degradation as much as possible, remove the unsightly oxidations and mineralizations that attest to their ineluctable decay, but of those pieces issued before the era of modern conservation awareness, we will never see them as they were when new. Copper is a highly reactive metal and, as is well known, it can oxidize quite rapidly in a damp, acidic environment. Hydrosulphuric acid is present universally in small amounts, and will eventually contaminate most coins or medals. We can at most hope to keep these pieces in a stable, legible, and maybe even aesthetically pleasing patinated condition or scoured condition.

Silver is also an effective scavenger of free sulphur, and will inevitably tarnish. Certain collectors and dealers enjoy the variegated hues of what they call toning - the coloration that can form on the surfaces of silver as a part of its natural oxidizing process. Others artificially induce similar colorations to enhance the appeal of coins or to disguise surface blemishes. There are at the same time those who have insisted on cleaning coins to free them from the discoloration and ongoing chemical dissolution compound. Either way, the coins are losing silver from their surfaces at a molecular level.

There are a number of methods employed for removing the corrosion products of galvanic action and other contaminants from the surfaces of coins or medals. My purpose here is not to explore all of them, but to suggest that in certain cases various ones could be judiciously considered. For the general public, and numismatic Hectors at large, my advice would be, basically, not to clean any but the most obviously muddy coin lacking any archaeological context. For professional museum personnel, however, with the awareness that the surface contaminants may also be of value, it is well to be conversant with some of the treatment methods currently employed by conservation specialist. Briefly, these can be listed as follows:

1. Pre-treatment. Recording, sampling, degreasing. This in itself could involve a sophisticated chemical treatment.
2. Mechanical. Chiselling, filing, sanding, excavating. This might today involve utilization of fine air-abrasive, or even a laser beam.
3. Washing. Soaking, immersion in an ultrasonic tank (possibly with various detergents). Useful for de-ionizing and drawing out soluble contaminants.
4. Chemical dissolution. Dipping in acidic or alkaline complexing agents, as in removing tin oxide from pewter with lye.
5. Conversion coatings. Changing the mineral product into another, less reactive mineral product; liken to industrial pre-priming.
6. Electrochemical reduction. Using solid reducing agents, such as zinc or aluminium, or non-metallic solutions, such as phosphate.

7. Electrolytic reduction. Essentially reversing the corrosion build-up of sulphides and chlorides; liken to industrial plating. May be fully rectified, partly rectified, or consolidated.
8. Gaseous reduction. High temperature procedure sometimes good for marine pieces.
9. Plasma reduction/oxidations. Generally conversion back to elemental metal.
10. Coatings. Lacquers and waxes, becoming increasingly popular for some pieces.
11. Technical storage support.

Clearly, some of the treatment techniques can only be considered in facilities with access to extensive conservation laboratory capabilities. Others may be addressed, with caution, by anyone maintaining a high standard of care and safety. Some gentle washing with warm water and a mild detergent for instance, is likely to be effective, with little damage potential if it is executed with care.

Beginning this summer, the American Numismatic Association is planning to initiate a pilot program offering conservation consultation and some basic preventive and remedial cleaning. We will provide pre-treatment services along with a number of other new programs to try to help educate the public. Through the ANA membership, we are hoping to make available a higher level of care to those individual collectors who seek, as we do in the museum profession, to guarantee the optimal preservation of their coins and medals. In future, thus, we expect to have considerably more specific insights into some aspects of the cleaning controversy.

RESTORATION

Restoration is surely anathema to many numismatists, as it is to many in the museum profession in general. However, if we are going to try to think in terms of rules, there definitely do come times when reintegrating fragments is the only means by which a few meaningless minuscule metallic shards can be turned into a coin evocative of great currents and personal passions in history. There are professional restorers who piece specimens back together, soldering, splicing, gluing, grinding, plugging.

I feel there is a place for these practices, but not necessarily in the museum. Maintaining the integrity and tangibility of the object should probably be our only concern in this connection.

Many cleaning techniques will definitely restore the appearance of coins or medals, but in this sense we are probably thinking in terms of pieces that have retained their physical integrity, whereas what I would call restored pieces have not.

CATASTROPHE

The best rule I can give you concerning catastrophes is: don't have one! And in order not to have one, the best course is to plan to experience the unimaginable! A workable disaster plan (can there really be such a thing?) is an essential part of modern risk management, and a key tool for preventive conservation – the sort of conservation rule that everyone can agree to adopt. What will make a good disaster plan? For numismatic collections, there would have to be some special considerations. One that I might not have thought of was provided to me by a British colleague, who pointed out the grave necessity of having your coin chests be small enough to be easily carried to a place of safety or concealment in time of war, and that the handles should be hinged to only move to a horizontal position, so as not to pinch your fingers during your flight with the chest.

Other important points would depend upon the situations of individual facilities. A low-lying building might need to be well-prepared to deal with the emergency of a flood. An area prone to winds and dust storms might need to be especially mindful of accumulating particulates. A location near an industrial complex might take care to control exposure to sulphur or hydrocarbons. The thing is that it is a lot easier to think through some first steps before they become necessary in some sort of catastrophe. Probably the most important aspect of any disaster plan is that it be very simple, clear and well understood. Few human beings could be expected to respond to a real-life catastrophe by immediately setting aside some time to read a 50-page instruction manual.

CONCLUSION

Artifacts are tangible moments in time. From that point on they are deteriorating. They manifest inherent problems of material, structure and environmental contact.

Conservation and preservation are based on common sense, and many of the principles involved are so common place that they are often overlooked. Responsible collection management begins with determining the appropriate balance between the preservation of a collection and the demands of access to that collection. (Graham-Bell: 986,.1).

Preventive conservation or good housekeeping is the vanguard of maintenance. With cleaning and restoration we may be thinking too much of remedial conservation, which may be useful, but is not always required. As we have seen, there are many hazards to which coins and medals may be subjected through time. In our care they can best be protected by the preventive measures of avoiding, blocking and detecting. We avoid as far as possible improper handling and environmental fluctuations; we block moisture and air pollution; we monitor the appearance and micro-environment of the specimens. Our rules, our guidelines, are the

means for stabilisation, for seeing as little deterioration as possible take place during the brief span of our watch here on earth. I recommend, for any of you who may not have conservation departments in your own institutions, that you establish a relationship with a conservation laboratory for technical assistance and professional surveys of your facilities. For those of you who are already associated with professional conservators, continue your preventive measures and review processes.

Thank you for permitting me this opportunity to speak with you on a subject that has been near and dear to my heart for many years, as I am sure it has also been for many of you.

REFERENCES

Graham-Bell, Maggie 1986, *Preventive Conservation: A Manual*, Victoria: British Columbia Museums Association.

MacDowall, David William. 1978. *Coin Collections: Their Preservation, Classification and Presentation*. Paris: UNESCO.

Plenderleith, H.J. and A.E.A. Werner. 1956 (reprinted 2nd ed. 1988). *The conservation of Antiquities and Works of Art*. London: Oxford University Press.

There are a host of other useful technical papers, including many offered by the Canadian Conservation Institute and the American Institute of Conservation.

BASIC CASE DESIGN STIPULATIONS FOR METAL OBJECTS

1. No unpainted plywood should be used in display cases for metals, in as much as volatile acids from the woods and from the adhesives in some plywoods have been shown to cause metal corrosion, on lead and copper alloys in particular. For similar reasons, no uncoated and unseasoned wood of any kind should come into direct contact with the metal objects.
2. No rubber-based fabrics, rubber-backed carpeting, or rubber-based adhesives / sealants should be incorporated into the cases. Sulphur from natural rubbers will tarnish silver, copper, pewter, lead, iron and many other metals. Chlorinated rubbers may create chloride corrosion problems. Sulphur-containing fabrics, such as wool, and bleached fabrics should not be employed as lining materials, nor should wood pulp or newsprint be used in the case. Saran-type plastics and acetate are not suitable in case design.
3. Wooden cases that are to be painted specifically for any exhibition/show involving metals must be thoroughly dry and well-ventilated before any metals are placed within. Solvents and volatile additives in paints can damage metals. Many latex paints, for

instance, contain ammonia, which is an active corrodent for many metals. As the paint dries, the ammonia evaporates and is dispersed in the atmosphere, provided there is adequate ventilation.

4. Plasticine must not be employed to hold metal objects in place; it is liable to cause corrosion and etching in many instances, as are rubber bands. Iron wires, nails and pins cannot be used to hold metal objects in place, as they abrade softer metals. Plastic covered pins and heavy nylon thread (clear fishing line) are normally adequate alternatives.

5. General conservation principles:

a. The relative humidity should be as low as possible within the cases displaying metals; in cases where only metals are displayed, the humidity should be kept as low as possible; in cases where organic materials must also be displayed (if absolutely necessary) the relative humidity should not exceed 55%.

b. Under no circumstances should food or liquids be displayed in or near metals.

c. Whenever handling metals, packing, unpacking, etc., gloves must be worn; acids and salts from the skin can etch metal surfaces.

d. Any vapour phase inhibitors (V.P.I.) proposed for the cases should be approved by a metals conservator.