



Association of
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Success Guides

Successful Basic Interventive Conservation

*A companion to the
Success Guide,
Successful Collection
Care*





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Ariennir gan
Lywodraeth Cymru
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Front cover picture: The conservation of the silver collection at Birmingham Museums & Art Gallery. Swab cleaning with calcium carbonate to remove the tarnishing from silver.

Successful Basic Interventive Conservation

A companion to the Success Guide, *Successful Collection Care*

This guide aims to lead you through the conservation that it is safe for you to carry out yourself and to help you decide when to use a conservator.

1. Introduction

The word 'conservation' can be used in relation to museums and the natural environment and it can be difficult to know what is meant by the term.

In museums, there are two approaches to conservation. One is **preventive conservation** or collections care, which tries to manage various factors to prevent or reduce the effects of decay on a daily basis. The other is **interventive conservation**, which is the process whereby objects are stabilised, cleaned or supported to ensure their survival and to aid the interpretation process, without removing the evidence of their past life. This guide is concerned with interventive conservation.

Who should carry out the conservation of an object? It depends on the condition of the object and the level of treatment required. The natural choice is a conservator, preferably one with a professional accreditation through the Institute of Conservation (Icon). Unfortunately, many museums have very little, if any, budget to spare for conservation. This guide aims to lead you through the conservation that it is safe for you to carry out yourself and to help you decide when to use a conservator.

This is a brief guide covering a multitude of materials found within museum collections, therefore it is recommended that you refer to the guidance notes for the specific material you are working with prior to commencing any treatment. Useful information can be found in the 'How to care for . . .' section of the Icon website: <http://www.icon.org.uk>, and in the Canadian Conservation Institute

(CCI) Notes in the resources section of: <https://www.cci-icc.gc.ca>

2. Assessing an Object

Before carrying out any work on an object, or indeed, determining if any work is required, it is very important to assess the object. This will enable you to get to know the object and establish its condition. You should be able to determine if the object is dirty or damaged and if any work has been carried out previously. This is a straight forward procedure, but it is one that requires a little time. You may like to devise a tick sheet to help you think about the same criteria to check each time. Such an assessment can be used for objects entering the collection or for those going on loan.

At the end of the assessment you should have established if it is appropriate for you to carry out the work or if a conservator is required.

Guidelines for carrying out a condition assessment:

- Before beginning the assessment, refer to the object's previous documentation as this should show if any work was carried out in the past and what condition the object was in when it arrived at the museum.
- Prepare a suitable work space that has: good light conditions so that you can see the entire object clearly; good ventilation, as you may be using chemicals such as solvents; and is secure, as you may have to leave the object for a period of time during treatment. It is advisable that you avoid using a room where food and drinks are prepared and eaten, such as a kitchen or canteen, or one that

is frequented by staff or where visitors have access, such as an office.

- Think about the handling requirements of the object. Can it support its own weight or does it need support from acid free tissue paper, Plastazote, cushions, etc? Can you move and lift the object or do you need someone to help you? If you have to move the object to examine it, make sure it is packed properly so that it does not get damaged in transit.
- It is recommended that you wear gloves when handling the object. It may be dirty, contaminated, or have sharp edges so protecting your hands is important. If it is a large, heavy object wear rigger-type gloves. If it is a smaller object such as a tool, advertising sign or toy, wear thinner gloves. Many museums now use nitrile gloves in preference to cotton as the fit is closer, giving them better tactile abilities, and they will not catch on rough or loose surfaces. If the object has a vulnerable surface e.g. white marble, polished metal, gilding, lacquer, inlay etc, wearing gloves will protect the object from your hands. Finger marks can etch into metal surfaces and the natural oils and grease from your skin can stain other materials and accelerate metal corrosion.
- Look at the object as a whole – is it dirty, broken, corroded, cracked, pest damaged, deformed? Are parts missing? Has it been modified in the past or have additions been made to it? Is there any evidence of past repairs? Is there any historic evidence of the object's use?
- Look at these areas more closely and be specific about what the damage is. Avoid using general terms, such as 'fine' as it can be difficult to remember exactly what the term was meant to mean when the object is looked at again. Use simple terminology to describe the damage such as 'handle missing' or 'cracked on right side'. This means that there is no confusion over what you are recording.

- List all the kinds of damage, even if the areas are very small – include hairline cracks and spots of corrosion.
- If the object is made from different materials or different parts, try to look at each material or part separately. Remember to look underneath and inside the object. A torch can be useful for this.
- Record what you see. Draw a sketch to show where the damage is or annotate photographs. Digital images are particularly helpful for this.
- If the object is in excellent condition then state this, perhaps also noting that there is no visible damage.

Having assessed the object, you then need to decide if any action needs to be taken. The future use of the object will inform the treatment. If it is going on display you may want it to look its best, whereas if it is staying in store ensuring that the object is stable may be sufficient.

If the object is dirty but otherwise stable you may decide that no further action is required. If you conclude that the damage is likely to get worse or if the object is difficult to understand because of the dirt, distortion, damage etc, then some kind of conservation may be necessary. The extent of this will depend on what treatment the object requires and the budget available.

Any conservation should retain the history of the object, should not remove any surface finishes or parts unnecessarily and should in theory be reversible. However we should work on the assumption that no treatment is *fully* reversible and it is not always possible to return the object to the state it was in before the treatment occurred, e.g. one cannot put the dirt back! It should, however, be possible to remove any conservation materials required by the treatment without causing damage to the object. For example, the reversal of adhesives used.

No treatment is *fully* reversible and it is not always possible to return the object to the state it was in before the treatment occurred.

Dusting is carried out using a lint-free cloth, ideally micro-fibre. Fold it to make a pad to fit the palm and clean using flat wipes, in the direction of the grain if there is one.



It is important to note that improving the environment, storage or support may be more beneficial than hands-on conservation.

3. When You Need a Conservator . . .

After assessing your object it is important to decide whether it is safe to attempt the conservation work yourself, or whether you require a conservator. If treating the object is beyond your ability, knowledge and experience, then a conservator is necessary.

Conservators can offer a range of treatments for an object depending on the level of conservation required (eg. storage, display, or transport), the budget, and the time constraints. By providing a conservator with a detailed brief of the condition of the object and the requirements for the treatment of said object, they can provide a quote with a variety of treatment options catered to your requirements – this will allow you to select the treatment that you want and can afford. Don't be afraid to communicate with the

conservator throughout the process – they would rather spend time doing this in order to have a satisfied client and safeguard the integrity of the object.

Conservators can also offer training in conservation of objects, for example, a practical day on handling and cleaning silver, or training on chemical use and management.

4. Health and Safety

The next section details some conservation treatments. It will introduce a range of common conservation materials including solvents and a range of appropriate chemicals that are commonly used by conservators that fall under the Control of Substances Hazardous to Health Regulations 2002. All solvents and conservation materials are potentially hazardous. A material safety data sheet (MSDS) should be obtained at the time of purchase (they can be found on the internet if they are not supplied) and this should be used to create a COSHH assessment, a template for which can be found here:

<http://www.hse.gov.uk/nanotechnology/coss-assessment-form.doc>. These assessments show you how to use the material safely and how you can limit the risk posed by the material to your health and that of those around you. These procedures are regulatory.

There are basic rules that you should follow when dealing with solvents and chemicals to reduce the risk to your health:

- Wear gloves.
- Wear a suitable face mask to protect from chemical fumes such as solvents and particulates produced during treatment, such as dust.
- Work in an area designated for object treatment, which is secure and well-ventilated, avoiding areas where people work, prepare food and eat.
- Wear an apron or lab coat to protect clothes.
- Tie hair back and remove large or dangling jewellery.
- Ensure that feet are adequately protected. Open-toed sandals are not appropriate footwear for conservation.

Keep solvent bottles and containers closed and only have small amounts present on the work table. Large quantities of solvents should be stored in secure well-ventilated areas, preferably in fire-proofed cupboards.

Make sure that you use appropriate containers – old food and drink jars are inappropriate: chemical bottles are best, although glass bottles and jars designed for oils and pickles are acceptable – and label them clearly. One colourless solvent looks much like another. Blue lid glass laboratory bottles such as those sold by the laboratory equipment supplier Scientific and Chemical Limited are ideal for storage of solvents and adhesives.

Note that **any** material used in a work context needs an MSDS and COSHH assessment. This includes water and everyday materials such as washing up

liquid. This may seem odd, but it is just to ensure that the work environment is safe for everyone.

5. Cleaning

5.1. Introduction

If you decide to undertake a treatment, it is important to remember that if you feel unsure in any way during the process, you should **stop**. If the object seems weaker than you anticipated, if you find that you aren't confident about continuing or if you have any concerns about the treatment you have selected, stop and seek advice from a conservator. It is better to be safe than sorry.

Cleaning can often produce a dramatic visual result and may be all the work that is necessary. It can be broken down into two main types:

- **Dry methods** that use brushes, dusters, vacuums and smoke sponges. These remove loose dirt and dust.
- **Wet methods** that use detergents, water and other solvents. These remove dirt that has adhered to the surface and cannot be removed by dry methods.
- In addition to these methods there is **polishing**. In the case of metals, this refers to the use of wet or dry methods to remove corrosion and/or tarnish (see section 6).

Note that all the cleaning methods described in this guide are surface cleaning methods. Immersion methods should only be carried out with the guidance of a conservator.

Always test the method you select in a small, inconspicuous area to ensure that the object can physically withstand the cleaning and that the cleaning does not damage the surface. It is important to note that the surface can vary across an object, and that one treatment may not work across the entire surface. It is therefore important to be vigilant

Immersion methods should only be carried out with the guidance of a conservator.

Brush labelled with material and padded ferrule. Brushes help to remove dirt from rough surfaces. To ensure that objects are not damaged by fragments from other objects, label brushes with material types and only use them for that material. The metal ferrule may scratch the object. To prevent this, pad it with masking or insulation tape.



throughout the process as not all surfaces on an object will react in the same way. A different treatment may be required depending on the surface.

5.2. Dry Cleaning

5.2.1. Methods

Always begin with dry methods. Dry methods are usually least likely to cause further damage to the object and can be incorporated into housekeeping programmes.

Brushes

Brushes are used where the dirt is loose on the surface, if the surface is rough or if it has a lot of undercuts. It is usually a good idea to use brushes made from natural bristle as this generally does not scratch. Hog's hair and pony hair are the types most commonly used. It is useful to have several brushes of each type of bristle and brush size/type as they can be used for different material types and different jobs, e.g. brushing a stone sculpture, a wooden box, a piece of taxidermy or brushing a frame, although note that gilded frames should only be cleaned with a soft brush.

Useful for:

- Cleaning objects with moulded or carved decoration.

- Cleaning rough or delicate surfaces.

Method of use:

- The ferrules of brushes (the part that holds the bristles) should be bound with masking or insulating tape to pad them so that they can't scratch or damage the object.
- Brushes should be labelled with a material type (wood, metal etc) and they should **only** be used for that type of material. This avoids damaging an object by scratching it with particles from another material or depositing dirt onto another object.
- Bristle type should be matched to the material to be cleaned. You should start by using a brush made with pony hair before trying a hog's hair brush, as this is stiffer than pony hair and is therefore only suitable for robust surfaces. Small artist brushes can be useful.
- Dust from the top of the object downwards.
- Use a gentle sweeping or flicking motion to lift the dirt off and away from the surface. Brushes are usually used in conjunction with vacuum cleaners as the brush lifts off the dirt and the vacuum removes it (see section on *Vacuum cleaners*).
- Brush along the grain (if there is one) to lift dirt out of the crevices.

- Brushes should be washed after use. Use a mild, liquid, detergent, such as Stergene or Boots Sensitive Skin Laundry Liquid or Surcare washing up liquid.
- Massage the detergent into the bristles and rinse under a tap. Allow to air dry.

Dusters

Dusters should be lint-free so that they do not leave fibres on the object or contribute to dust in the space. The best duster is the micro-fibre cloth. These have a slight static charge that attracts and holds the dust.

Useful for:

- Removing dust from smooth surfaces as a quick and easy way of doing so.
- Cleaning objects on display, particularly the horizontal surfaces where dust collects.

When cleaning with dusters it is important to avoid damage or destruction to fragile surfaces, such as flaking painted surfaces, or loose gold gilding.

Method of use:

- Fold the duster into a pad about the size of the palm of the hand. Place the duster onto the surface and clean using a flat wipe from one side to the other, not the traditional circular dusting and polishing motion.
- Do not use on rough or damaged surfaces as the duster may snag and cause further damage.
- Keep refolding the duster so that you are always using a clean area.
- Once dirty, dusters should be washed. They may be hand washed in a mild non-ionic detergent, such as Stergene or Boots Sensitive Skin Laundry Liquid or Surcare washing up liquid or in a washing machine. Also avoid using fabric softeners as these may leave a residue on the duster which could be transferred onto the object. Always make sure to rinse well to remove any remaining detergent and dirt particulates.

Vacuum cleaners

These are used to remove dust from an object or room. They can be used in



Using a brush and Hoover to remove dust.

conjunction with brushes or alone with the vacuum cleaner attachments.

Useful for:

- Taking dust away.
- Cleaning objects with moulded or carved designs in conjunction with brushes.
- Cleaning textiles.
- Cleaning rooms or galleries.

Method of use:

- Vacuum cleaners for general cleaning and object cleaning should be kept solely for their separate functions.
- Vacuum cleaners for object cleaning should have variable suction and this should be used at its lowest setting initially until you are certain that the surface is robust enough to withstand further suction, if the treatment requires. Vacuums designed for museum use are available from conservation suppliers, but variable suction can be added to most vacuums by asking a vacuum cleaner engineer to fit a *potentiometer*.
- If used with *brushes*, the vacuum cleaner is used only to catch the dust. The vacuum cleaner should be used without the brush attachment and the end of the tube should be held close to the brush so that the dust can be swept into it.

Cleaning silver with calcium carbonate.



- Before using the vacuum cleaner on the surface of an object a net, gauze or a piece from old tights should be fixed over the end of the tube with a rubber band to prevent any pieces of object that may become detached from being sucked into the vacuum bag. The net will need cleaning periodically – remove it and either pick the dust off or carefully vacuum the net/gauze and then replace it. The end of the tube can be padded with Plastazote or a similar material; this is particularly important if the object could be damaged by contact with the tube. Care should be taken not to place the vacuum body on the object as this may crush or otherwise damage the object.
- Textiles should be vacuumed through a screen to prevent sucking up loose fibres. The screen can be made from stiff net or fly-screen material and the edges should be bound with masking tape or tacked to a wooden frame. It is important when moving to the next section of the object to be vacuumed, that you lift the screen rather than dragging it across the surface, as this will reduce the risk of damage to the object. It is also important to pad the edges of the screen.

- At any time you find loose fibres or excessive damage before, during and even after treatment, you should contact a textile conservator for advice.
- Floors, walls and ceilings can be cleaned using the floor tool. Take care as some floor tools have wheels and these will mark painted surfaces.
- Be cautious with both of these attachments and remember to start on the lowest suction as it is all too easy to damage the object – damage may not be obvious.
- The crevice tool can be used to clean the gap between floor and skirting board and inside ventilation grills. The flat upholstery tool may be used on robust textiles but do check for loose pile or fibres. Care should be taken to avoid bumping the vacuum into objects.
- Vacuum cleaners should be washed out periodically, including all the hoses and attachments to ensure that dirt and insects are not transferred to other objects or areas. Remember to replace HEPA filters at regular intervals if the vacuum cleaner has one fitted.

5.2.2. Conservation-Approved Dry Cleaning Products

If the dirt seems to be bound more closely to the surface then methods that come into closer contact with the object may be effective.

The following methods can be utilised on stable surfaces such as stone, plaster, unglazed but not powdery ceramics, tiles and wood including non-powdery polychrome:

Smoke sponges

These are sponges impregnated with chemicals that act as a dry detergent, bonding with and removing dirt. They were originally created to remove smoke deposits.

Useful for:

- Removing dirt that is bound to a surface but where solvents may damage the surface.

Method of use:

- Cut a small piece from the smoke sponge. Use it dry and gently stroke it over the dirty area.
- Be careful to support the object so that cleaning does not tear or wrinkle the object.
- Rotate the piece of sponge as it gets dirty and wash after use. They can be reused several times.
- You can cut the smoke sponge into smaller fragments to use on surfaces where appropriate.

Erasers

Erasers can be used in the same way as smoke sponge, but should only be used on hard surfaces. The plastic erasers are the most useful – natural rubber may mark the surface. Useful to lift a pencil mark off a sculpture.

5.3. Wet Cleaning

5.3.1. Wet Cleaning Methods

If dry methods do not remove much dirt or there still seems to be dirt bound to the surface, then wet methods may be more effective. However, it is important to contact a conservator if you are in any doubt as to how to proceed. It is important to note that these methods do have some dangers attached: solvents work by penetrating the surface layer, either softening or swelling that layer. This could simply be a compacted dirt layer or it could be dirt ingrained into a varnished surface. This could mean that surface coatings may be removed, colours may bleed and corrosion may be activated.

Test your solvent on a small, inconspicuous area first. Wait for the area to dry completely and then assess the surface. If there is any clouding, discolouration, colour movement, removal of any surface coatings or other negative changes, **do not continue**. Remember, you cannot put back what you take away.

If there is any clouding, discolouration, colour movement, removal of any surface coatings or other negative changes, do not continue. Remember, you cannot put back what you take away.

Over-zealous cleaning may remove the original surface finish and may leave an object that no longer seems to be historic.

Paper, oil paintings and textiles should never be cleaned using a wet method unless the work is to be carried out or directed by an experienced conservator. Certain types of materials and objects should not be cleaned with any solvent other than water, and should not be wet cleaned at all, without consulting a conservator for advice. These include varnished or painted wood, lacquered surfaces, porous surfaces such as stone, bone and ivory and natural history specimens.

Wet methods refer to all techniques that wet the surface. Water and other solvents can be used in combination or singly and can also be used with or without detergent, ideally one that is non-ionic. Conservators generally use Synperonic A7 but any mild, non-biological detergent can be used, such as Boots Sensitive Skin Washing Up Liquid or Surcare Washing Up Liquid. It is very important that you test on a small inconspicuous area of the surface prior to using across the entire object. If using a detergent always ensure you remove any detergent residue at the end with water and/or solvents, depending on the surface.

Think carefully about the end result you want before you start the cleaning.

Be careful not to over clean. Over-zealous cleaning may remove the original surface finish and may leave an object that no longer seems to be historic. It is important to state at this juncture that the dirt and damage to the object may have a historical significance and removal through treatment may result in the loss of this important aspect. An example of this may be the cleaning of food remnants from an ancient vessel or the removal of an historic repair. The level of cleaning depends on the context of the object and a curator should be consulted where advice is needed. Your visitors want to gain a sense of history in the collections on show, so try not to eliminate this completely.

5.3.2. Conservation-Approved Solvents

Conservators are trained to identify materials and to assess the surfaces of the objects they treat. This includes identifying decorative layers such as paint, lacquers or varnishes, as well as layers that are the result of deterioration and deposits such as dirt, pollution and staining. This training and knowledge helps conservators to determine which solvents or combination of solvents are suitable for use on a particular surface, and cater their treatment accordingly. Use their knowledge and contact them for training or advice.

All solvents have a cleaning, softening and dissolving effect on dirt layers, surface finishes and also any adhesives that may have been used in the construction of the object. So seek training and proceed with caution.

A definitive health and safety plan for the storage, handling and use of these solvents is required at all times, as well as completed COSHH forms, to prevent harm to those working in the museum and the object itself. See the link in section 4 for COSHH documentation templates.

Method of use:

Wet methods are usually carried out by applying the solvent to the object using cotton swabs. This can be a purchased cotton bud or a hand rolled swab. Hand rolling allows you to make exactly the size swab required and is cheaper than buying cotton buds. They are also preferable, as store-bought cotton buds contain a plastic element that may dissolve in the solvents used.

- Swabs should be rolled across the surface.
- Swabs should be disposed of as soon as they are dirty – do not put a used swab back into the solvent.
- If detergent is used, the object should be rinsed by going over the area with a swab of plain solvent to remove the detergent.



Swab cleaning showing swab jar and cleaned strip. Cleaning using a swab (home-made cotton bud) – see the cleaned strip on the object. The jar allows for safe and easy disposal of the used swab.

- Swabs, and any other material used with solvent, should be disposed of in a container that allows the solvent to evaporate slowly in a well-ventilated area. This can be a swab jar – made from a jam jar with a hole pierced into the lid – or an empty drink can. Push the swab into the hole and pull out against an edge of the hole. This pulls the swab off. Cotton buds must be thrown away whole. Once the solvent has evaporated completely the swabs may be placed in a bin.

The following solvents are those most commonly used in conservation:

Water

This is the most widely used solvent and solvent testing should always begin with water. It is a much stronger solvent than is generally appreciated and will remove or lessen most dirt deposits. Where possible, use deionised or distilled water as these will not leave any mineral deposit on the surface of the object. These are readily available from suppliers such as Halfords, petrol stations, or larger supermarkets.

Useful for:

- Cleaning of objects and removal of

dirt from intricate surfaces.

- Removing organic adhesives, especially when applied in a cotton wool poultice.

Remember to test this on a small area first prior to using across the entire surface of an object.

Glass and most glazed ceramics can be cleaned with a swab dampened with water with care. Check that any decoration is under or part of the glazed surface prior to cleaning otherwise it may lift with the swab. However, in the case of highly degraded glazed ceramics, damaged and repaired ceramics, crizzled glass and archaeological glass, dry treatments are recommended. Consult with a conservator if required when dealing with these types of artefacts.

Saliva (active ingredient salivary amylase, an enzyme)

Human spit is widely available and is a very cheap solvent. Always test on a small inconspicuous area of the object prior to use. If you find it is safe to use on your object, always carry out a final swab with distilled water.

Useful for:

- Removing dirt and dust.

According to government legislation a licence is required to purchase and use IMS (Industrial Methylated Spirit) so would only be used by a conservator or under conservation supervision.

Acetone

This evaporates very quickly and so is useful for objects that should not be wetted. Always test on a small inconspicuous area before using to clean an entire object.

Useful for:

- Removing oil or grease.
- Cleaning break edges before repairs are made.
- Removing some adhesive residues.

Industrial Methylated Spirits (There is soon to be a name change to IDA Industrial Denatured Alcohol). According to government legislation a licence is required to purchase and use IMS (Industrial Methylated Spirit) so would only be used by a conservator or under conservation supervision.

IMS does not wet as much as water but evaporates more slowly than acetone. Remember to test on a small area of the object prior to use.

Useful for:

- Removing greasy dirt.

White Spirit

This solvent does not affect as many surface finishes as acetone and IMS, but it can affect painted surfaces, and may also cause other substances to swell and dissolve, therefore it is important to test on a small inconspicuous area first. It has a very pungent smell.

Useful for:

- Degreasing.

6. Metals

6.1. Understanding Corrosion and Corroded Surfaces

Metals suffer the effects of corrosion, which is the deterioration of the surface due to chemical reactions between it and the surrounding environment. There are many different types of corrosion which affect objects in different ways. There is some useful literature available on how to identify different types of corrosion, such as the

helpful free online Canadian publication 'Rust Never Sleeps'. Much of the corrosion that we see on metal surfaces is stable and actually forms a protective coating on the surface, preserving the metal beneath. As a general rule, a dull colour combined with a very adherent, coherent surface means that the corrosion is inactive and stable. It is generally preferable to leave this coating well alone.

Corrosion that has a bright, vibrant colour and is loose or powdery (it may also be present in small spots rather than covering a large area) is usually active and action should be taken to prevent further corrosion. This often means moving the object to an area of lower relative humidity or removing a source of acid, such as nearby deteriorating plastic. By treating the source of the corrosion, it is much more likely that the object will survive as corrosion is much less likely to re-occur.

6.2. Conservation of Metal Surfaces

Within a museum collection there may be numerous types of metal objects, made from different alloys, with both decorative and non-decorative surfaces. This difference may even occur over a single object. Depending on the history of the object and the type of metal, the surface may have suffered deterioration and corrosion in different forms. For example, historic metal surfaces will have different deteriorated surfaces to archaeological metals, and decorative metals will have different corrosion products to non-decorative surfaces. It is important to recognise this difference to determine the type of treatment that is safe to use. For example, archaeological silver would not be treated in the same way as historic silver. They have different surface conditions: in the case of archaeological material it may be highly degraded. Historical silver can be polished with the methods described below provided the object is robust

and does not have a lacquered surface.

If cleaning is deemed necessary always begin by testing your object with the least interventive treatment, such as dry cleaning (described in section 5).

For robust, non-decorative historic iron and copper objects (e.g. tools from an agricultural collection) with corrosion products on the surface where removal of the corrosion is deemed necessary, then very fine wire wool (0000 grade) can be used in combination with a medium such as White Spirit or a mineral oil such as 3 in 1. If a more abrasive treatment is required, the wire wool can be used with Autosol or similar polishes. Only try this method on corrosion products on hard metals such as steel, iron or some copper alloy surfaces. It is important to understand that these abrasive methods should not be used on softer metals such as gold, silver or those with decorative surfaces.

Polishing

Polishing is a standard method of removing tarnish from historic metal surfaces, however this can be very damaging to objects – all polishing removes a thin layer of the surface and over time this can lead to significant damage, such as wearing away inscriptions. In some cases polishing can cause more extensive damage and result in the removal of entire decorative surfaces, such as gilding or a patinated surface.

Remember to examine the surface of your metal object; you may find it has a lacquered finish and this may be historical such as on scientific instruments and should not be removed. If there is a lacquered surface contact a conservator.

Preventing tarnishing/dulling is the most effective method. Avoid handling polished metal without gloves – finger marks are very damaging. **Tarnish inhibitors** are very effective at preventing tarnishing, although the case or storage container needs to be well sealed for the inhibitor to be most

effective. They need replacing periodically, the time interval depends on the level of pollutants in the atmosphere and how well sealed the case/container is. Silver can be stored in bags made from inhibiting fabric. These are very effective over many years. (See web links)

Apply polish as infrequently as possible and only when the dry methods given above are not effective. Polishes should be used **extremely** sparingly, with equal attention applied to the removal of the polish as its application. The shininess can then be maintained by gently buffing the object with a silver cloth (suitable for non-silver bright work and copper but keep one just for use on silver). This also has the advantage that the tarnish deposits will be quite minimal and thus will not require much effort to remove them when the time comes to use polish again.

Method of use:

- Buffing with a lint-free cloth or a silver cloth is very effective at removing small areas of tarnish or dullness.
- Gentle cleaning with a very soft toothbrush and/or a swab with soapy water (hot water can be more effective) will usually remove medium tarnish deposits.
- Do remember to dry the surface thoroughly as moisture left on the surface may encourage corrosion. Dry thoroughly with plain white kitchen roll.
- On **steel, copper or brass** use mildly abrasive polishes such as Prelim or similar paste polishes or more abrasive polishes such as Solvol Autosol/Autoglym. Care and experimentation is needed when choosing an appropriate polish for each surface, as Autosol may be too abrasive for brass, for example, causing fine scratches to the surface. Use a tiny amount on a lint-free cloth or swab. Rub gently, allowing the paste to work – there is usually a moment when you will feel the dirt begin to move. Buff off with a

Preventing tarnishing/dulling is the most effective method. Avoid handling polished metal without gloves – finger marks are very damaging.

In the past, all manner of materials were used to repair objects, often those that would allow the object to extend its useful life.

lint-free cloth or clean swab and make sure that all the polish is removed or a white residue may be left that can be difficult to remove. Work on a small area at a time and only use polishes on smooth surfaces as rough areas tend to hold the polish. Solvents such as IMS, Acetone or White Spirit may be used to remove excess polish residue.

- For the polishing of **soft metal surfaces**, such as **silver**, a less abrasive polish made with calcium carbonate, is commonly used. Here the calcium carbonate (which is available on Amazon) is mixed into a paste with deionised water, White Spirit, acetone or IMS. This can then be applied on a swab and gently rubbed into the tarnish. Wait until it is dry and then brush it off with a small brush or use a small amount of solvent to remove it. This is a relatively non-abrasive polish and is thus safer to use than some commercial products. The other advantage is that any residue can simply be brushed off.

7. Polishing Wood

Depending on the nature of the surface, wooden objects may be cleaned using methods described in section 5, **provided you have carried out the necessary tests first to ensure your chosen method is safe to use.**

Wood can also be *polished*, which can remove dirt and add a shine to the surface. This can be achieved by the buffing of a wax that has been applied to the surface. It is important to be aware that excessive polishing can lead to a build-up of polish that may be disfiguring, attract and hold dirt on the surface and may damage the surface.

Method of use:

- Buffing with a soft cloth should be the first method tried, but do not attempt this if the surface is flaky or otherwise unstable.
- Renaissance (microcrystalline) wax is a synthetic wax and is hard at room

temperature. Apply very sparingly with a soft cloth and then buff.

- Beeswax polish is generally not used on objects in museums, only floors; this is because it can become tacky at room temperature, meaning that dust sticks to the surface.
- Do not use spray silicone polishes as these build up a layer of silicone, which can be disfiguring and is difficult to remove.

8. Repairs

Repair work needs to be very carefully considered and always approached with caution. Before attempting a repair, it is important to consider why the repair is deemed necessary – is it actually necessary to make a repair or is it possible to understand the object by some other method, such as a reconstruction image? If the repair is beyond your knowledge or expertise please consult a conservator.

8.1. What Should You Use?

In the past, all manner of materials were used to repair objects, often those that would allow the object to extend its useful life. These methods were often intrusive and disfiguring and many actually caused further damage to the object, e.g. rivets used to repair ceramics required holes to be drilled into the object; corrosion of the rivets can lead the ceramic to break again. The decay of these old repairs often results in discoloured areas, which can be very disfiguring.

Materials used in conservation today to make repairs should:

- Be removable – so that they can easily be removed from the object without damaging it.
- Have good ageing properties – so that the bond does not fail and they will not yellow with age.
- Be weaker than the object – so that if the object undergoes stress, the adhesive would fail (break) before the object does, reducing the risk of further damage to the object.

The adhesives used commonly in conservation are:

Lascaux

This producer manufactures a number of adhesives. One adhesive they produce is acrylic adhesive, water based and soluble in water. It is useful for repairing wood and organic materials. If this is unobtainable, use a low acid PVA or wood glue. Ensure that it is water soluble.

Paraloid B-72

An acrylic co-polymer available as resin or ready mixed. The resin is soluble in acetone and can be mixed in many different ratios of solvent to resin to give a thin adhesive that can be painted onto cracks or a thick adhesive that can be used to join two pieces together. It is useful for ceramics, wood, glass and small joints in stone.

The bond created by Paraloid B-72 is not a strong one. It will hold objects together, but the bond may not be enough to support the object – additional support may be required. The bond will not be strong enough if the object is to be used, perhaps as part of a handling collection, and so advice should be sought from a conservator on alternatives. Be careful when using on porous surfaces as the adhesive can migrate into the surface and discolour the surface.

Treat adhesives like solvents and **test first** to ensure that there is no discolouration, clouding, or loss to the surface.

These adhesives are suitable for most 3D objects. It is strongly recommended that you do not make repairs using adhesives on paper, textiles or oil paintings without seeking advice from a conservator. These items may be irreparably damaged by inappropriate adhesives.

8.2. General Method for Making a Repair:

- Use a magnifying lamp or microscope if available.

- Carefully test fit the broken pieces, ensuring that the edges are not ground together – this could cause further damage.
- Consider whether the object will require support whilst the adhesive sets. If so, have Plastazote, acid free tissue pads, small sand bags, a container filled with dried beans, or a tray filled with sand, available. Covering the sand with cling film will prevent the object from being scratched.
- Cut several small lengths of masking tape and stick these to the edge of the bench close to where you are working.
- Ensure that the joint edges are clean – clean and degrease with Acetone on a cotton wool swab.
- If the material to be repaired is porous or absorbent, paint a diluted layer of adhesive onto the surface with a small brush and let this dry. This helps to seal the break edges so that the adhesive is able to make a bond rather than be sucked into the object.
- Paint a very small amount of adhesive onto one surface and join the two pieces of the break together (making a joint).
- Test the edge of the joint with the end of your thumbnail. If you can feel a slight ridge, the joint is not properly aligned – carefully manipulate the pieces, testing with the thumbnail until there is no ridge. Note that it may not be possible to get a completely smooth joint if the object has sprung. The act of making an object often creates tension within the object, especially in glass and ceramics. When the object breaks, the tension is released and this allows the pieces to expand slightly or *spring*. Consequently, the pieces may never fit back together perfectly. Aim for the best fit you can get.
- Pushing the two pieces together, take one of the pieces of masking tape. Stick it to part of the object above the break quite firmly. Pull the tape tightly over the joint and press it down on part of the object below the

It is strongly recommended that you do not make repairs using adhesives on paper, textiles or oil paintings without seeking advice from a conservator.

Small repairs, such as restitching a press-stud to a garment, can be carried out using matching polyester thread and reusing the existing stitch holes or sewing between the threads of the fabric.

joint. Repeat with other pieces of tape until the joint is held securely.

- Support the object until the adhesive is set.
- Once the adhesive has set into a tacky state, but is not yet dried into its final hard set state, carefully remove the masking tape and remove any adhesive that has seeped out of the joint. It is generally easiest to do this using solvent on cotton wool swabs – Acetone will remove most adhesive residues when the adhesive is still in a tacky state, although water may be better for PVA. For excess Paraloid B72, (when it is still tacky), roll a tooth pick over the adhesive so it wraps round the stick, the adhesive can then be pulled free. Remember to clean both sides of the object. Do not leave the masking tape on the object for longer than a few hours as it may leave a residue and stain the surface.
- Let the adhesive set completely and document what has been done on the object record.

8.3. How to Assess Old Repairs

It is tempting to remove old repairs and replace them with something less disfiguring and more conservation friendly. It would be advisable to consult a conservator to discuss whether a repair can be removed, as doing so may put the structural integrity of the object at risk. Taking apart an old repair can be a difficult operation and one that may result in further damage to the object. You should also take into account the historical significance of the historic repair and whether it is ethically justifiable to remove it in the first place. Ceramic repairs involving rivets are especially difficult to remove. All old repairs are disfiguring, but it is safer for the object to leave the repair alone. If the object is needed for display and the repair is particularly distracting, consult a conservator.

8.4. Stitched Repairs

Small repairs, such as restitching a press-stud to a garment, can be carried out using matching polyester thread and reusing the existing stitch holes or sewing between the threads of the fabric. Interventive treatment of this kind on a textile can cause weakening of the object and can lead to further damage. These interventive treatments as well as larger repairs should be carried out by, or under the guidance of, a textile conservator, who should be consulted on all major intrusive treatments.

9. Conclusion

Accredited conservators are highly trained professionals and it is always worth getting their advice and commissioning them to undertake more complex interventive conservation work. They can also train your staff and volunteers to undertake more simple conservation tasks safely. The considered application of the approaches outlined here, underpinned by a good understanding of your collection and its needs should give all museums the confidence to undertake basic conservation, saving you money and making your collections more sustainable.

Further Reading and Suppliers

Ankersmit, B., Griesser-Stermscheg, M. Selwyn, L. and Sutherland, S. 2008. *Rust Never Sleeps: Recognizing Metals and Their Corrosion Products* Canada: Canadian Conservation Institute. <http://www.slideshare.net/vcbf5m/11griesser-rust-never-sleeps>

Barclay, R., Bergeron, A. and Dignard, C. 2002. *Mount-making for Museum Objects* Canada: Canadian Conservation Institute

Halahan, F. and Plowden, A. 2003. *Looking After Antiques*. National Trust. Second-hand copies are available on Amazon.

Horie, C.V. 1987 (2012 updated).
Materials for Conservation London:
Butterworths

Rogers, L. ed. 1997. *Ours for Keeps: A resource pack for raising awareness of conservation and collections care* London: MGC.

Quye, A. and Williamson, C. 1999.
Plastics Collecting and Conserving
Edinburgh: NMS Publishing

The National Trust. 2011. *The National Trust Manual of Housekeeping*
London: National Trust

Watkinson, D. and Neal, V. 1998. *First Aid for Finds* United Kingdom Institute for Conservation of Historic and Artistic Works, Museum of London, Rescue

Additional Reading

Museums & Galleries Commission
'Standards in the Care of':
Archaeological Collections, 1992.
Biological Collections, 1993.
Geological Collections, 1993.
Larger and Working Objects, 1994.
Musical Instruments, 1995.
Touring Exhibitions, 1995.
Photographic Collections, 1996.

All available through the Collections Trust website
www.collectionstrust.org.uk
Find them under the Collections Link tab and then Useful Guidance.

Museums & Galleries Commission, 2000. *An Illustrated Guide to the Care of Costume and Textiles Collections* London.

Online Conservation Resources

Canadian Conservation Institute (CCI)
Notes: <http://www.cci-icc.gc.ca/resources-ressources/ccinotesicc/index-eng.aspx>

Conservation Online (CoOL):
<http://palimpsest.stanford.edu/>
Good links, general and specialised information. Designed for conservation professionals.

ReCollections: <http://aiccm.org.au/conservation/collection-care>
Very useful site with good quality general advice on collections care.

Preserving my Heritage:
www.cci-icc.gc.ca
As above, useful site for general collections care advice from one of the world's leading organisations in this area.

Institute of Conservation (ICON):
www.icon.org.uk. The UK body for conservation.

Conservation Register:
www.conservationregister.com.
An online directory of conservators practicing in the UK; all the practices have achieved Icon's professional standard of Accredited Conservator-Restorer, ACR.

Information about tarnish-inhibiting materials for storage can be found at:
<http://bmagblog.org/2013/10/21/how-to-protect-your-silver/>

Conservation Suppliers

The following companies supply materials for conservation, including acid free tissue, gloves, storage boxes, smoke sponges, dust bunnies and museum vacs.

Preservation Equipment Ltd

Vinces Road, Diss, Norfolk IP22 4HQ
Telephone: 01379 647 400
Website:
www.preservationequipment.com
Email:
info@preservationequipment.com

Conservation by Design Ltd

Timecare Works, 5 Singer Way, Woburn Road Industrial Estate, Kempston, Bedford MK42 7AW
Telephone: 01234 853 555
www.conservation-by-design.co.uk
Email: info@conservation-by-design.co.uk

Conservation Resources (UK) Ltd

15 Blacklands Way, Abingdon, Oxon,
OX14 1DY

Telephone: 01235 553166

Website: www.conservation-resources.co.uk

Email: sales@conservation-resources.co.uk

Supplier of Paraloid and Lascaux

There are many other companies, but these three carry a good range of general materials.

Scientific and Chemical

Scientific & Chemical Supplies Ltd
Carlton House, Livingstone Road,
Bilston, West Midlands, WV14 0QZ,
United Kingdom

Telephone: 01902 402 402

Website: www.scichem.net

Email: info@scichem.com

Supplier laboratory equipment such as solvent jars.

Edward W Mason Brush Manufacturers

14 Brownfields, Welwyn Garden City,
Herts, AL7 1AN

Telephone: 01707 331 911

Email: masonsbrushes@btconnect.com

Supplier of excellent quality brushes at a very good price and often cheaper than comparable cosmetic brushes.

Nilfisk-Advance Limited

Unit 24 Hillside Business Park,
Kempson Way, Bury St Edmunds,
IP31 7EA

Telephone: 01284 763 163

Website: www.nilfisk-advance.com

Nilfisk UZ964 vacuum and bags. This vacuum is worn like a bum bag and has proved very easy to use in all museum contexts.

Satay sticks are available from supermarkets and kitchen shops.

Cotton wool (all-cotton is the most absorbent) from chemists and supermarkets.

Microfibre cloths are available from Lakeland, John Lewis and some supermarkets and the conservation suppliers.

Autoglym and **Autosol** are available from car supply shops, e.g. Halfords, hardware shops and some supermarkets.

Silver cloths and **copper cloths** are available from hardware shops and supermarkets. An internet search will bring up many suppliers.

Nitrile gloves are available from Preservation Equipment but are often cheaper from scientific/medical suppliers. Check your local Yellow Pages or try Scientific and Chemical.

White Spirit from DIY stores.

Acetone from chemists.

White Spirit, Industrial Methylated Spirit and **Acetone** from scientific suppliers, see gloves.

Acid-free tissue is also available (and is usually cheaper) from local packaging suppliers and is also available from the conservation suppliers. Make sure you get unbuffered and unglazed tissue.

Plastazote is also cheaper from the manufacturer than from the conservation suppliers. Check for local manufacturers or try:

Ramplas Ltd

84 Birmingham Road, Dudley, West
Midlands, DY1 4RJ

Telephone: 01384 453160

Fax: 0121 535 7108

Email: info@ramplas.com

Website: <http://www.ramplas.com>

Ciarán Lavelle is currently an Object Conservator for the Birmingham Museums Trust where he also works as a commercial conservator and provides conservation training. He has a background in archaeology and conservation and read for a BSc in Archaeology and Palaeoecology, a Postgraduate Diploma in Cultural Heritage and Museum Studies from the University of Ulster as well as a BSc and an MSc in Conservation from Cardiff University. He has worked on objects in museum collections and archaeological projects from around the world. He has worked on projects such as the Riverside Museum in Glasgow, the Museum of Bristol, the Science Museum, Staffordshire Hoard, on the Ruwayda and Rubayqa excavations for Lampeter University, the Athenian Agora excavation and the Methone Excavation for UCLA in Greece. He has experience in teaching conservation theory and practical skills, working as a teaching assistant on the Cardiff University conservation programme, teaching field schools to students on the UCL Qatar conservation programme, designing and teaching conservation courses and field schools at Cultural Heritage Without Borders Restoration Camp in Kosovo, and archaeological projects in Turkmenistan and Kazakhstan.

Lizzie Miller currently works as Object Conservator and Staffordshire Hoard Conservator at Birmingham Museums Trust (BMT) and has experience of a wide range of archaeological, applied art and historic objects. Following a BA in Archaeology, she trained at Durham University, gaining an MA with Distinction in the Conservation of Archaeological & Museum Objects, which included a nine month placement at the National Museum of Scotland. Since graduating Lizzie has worked as an Objects Conservator at Bevaringscenter Fyn (conservation centre), Denmark, and has undertaken an Icon internship at Bolton Museum focussing on preventive conservation. In her current role at BMT Lizzie undertakes interventive object treatments, trains interns and volunteers and works on commercial conservation contracts for other museums.



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