



Portable
Antiquities
Scheme

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Conservation Advice Notes



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Portable Antiquities Scheme Conservation Advice Note No. 1

Starting Out: Looking after your metal finds

Are you prepared?

- Before you start out, it's a good idea to create a system for numbering your finds, and recording the find-spot
- Keep anything you find safe by having the right bags, markers, and other materials with you
- Know how to recognise an important archaeological find and, when you do, what action to take and when to ask for help. Sometimes scraps of metal which look like rubbish are actually fragments of important archaeological objects!
- Have a look at the Treasure Act so you are familiar with the law on 'Treasure' (see <http://www.finds.org.uk/background/treasure.asp>)
- You might want to keep the contact details for your local PAS Finds Liaison Officer handy in order to report your finds (see www.finds.org.uk)



Found metals? – Dry them out*

- Most metal objects benefit from a dry environment. Take the finds you want indoors and leave them to dry out unwashed on a tray lined with white kitchen roll. Avoid putting finds directly on the radiator as this might dry them out too quickly and cause them to crack.



- Have you thought about using a 'DRY BOX'? Contact your local Finds Liaison Officer (FLO) to see an example. They will also be able to show you how to maintain a desiccated environment and halt corrosion.

*If you can see anything attached to your object, such as wood or textile, it might be better not to dry it at all!

Remember: take Advice Before Cleaning

- Most things you will find need no treatment other than dry storage.
- Conservation isn't just about cleaning and caring for your objects, it is about looking after your records of find-spots and other data as well.
- You may easily reduce the value of a find by 'conserving' it yourself. Make sure your find is not an important archaeological object first before cleaning it.
- If you are unsure about what you have found your local Finds Liaison Officer (FLO) will be able to help identify it for you.

Finding out more

- The FLO may occasionally ask an archaeological conservator to make an X-ray image of your find in order to see through the layers of soil and corrosion, or examine it under a microscope. This could help identify the object and the materials used to make it.



This iron lump was X-rayed and turned out to be an inlaid knife

- Hidden decoration, organic remains (e.g. textiles, leather, and wood) and manufacturing techniques may also be revealed.
- You may even find out something about the life of the object such as use, wear, damage and repair.



On site: Recording and Lifting Finds



To get maximum information from your finds it is important that they are lifted and recorded properly.

- What have I found? Is it an isolated find or part of a larger group? Metal finds may be associated with other objects or materials.

- Removing finds from the plough-soil does not usually disturb the archaeological layers below, but on unploughed land the archaeology can lie close to the surface.

Be responsible when choosing where to detect.

- If you think you have located a previously undiscovered archaeological find beneath the plough-soil, tell the landowner and your Finds Liaison Officer (FLO). The FLO can help to assess the site and (if necessary) can call in an archaeologist to help you dig, lift and record the finds.
- It's best to leave any unwanted finds where you found them.

Where was it found?

The location in which archaeological finds are discovered is just as important as the objects themselves.

- Having recorded your find spot on the bag, you can relate that to the National Grid Reference (see www.finds.org.uk for instructions, or ask your FLO to explain how to do this). Some people now use a hand-held GPS (global positioning system) as a fast way to record find-spot location.
- It is a good idea to transfer your readings to hard copy such as a map, or a computer database later on.
- You may also want to photograph your finds in the ground with a ruler or scale, or photograph the find-spot.
- Remember: part of caring for your finds is conserving the information about them for future generations.

Bagging and Labelling

- Once you have found something you want to keep, place it in a plastic bag. Polythene grip-top bags with white strips are best. Your FLO can tell you where to get hold of these.
- You can write the find spot and any other information you want directly onto the bag. Labelling your bags is important if you want the information about your finds to last.
- Permanent black marker pens for bag marking (e.g. Artline® pens) will not fade over time.
- Always bag finds individually for protection and to stop them



getting mixed up. It is a good idea to punch small holes in the bags to provide ventilation and stop harmful condensation from forming.

- Remember, if you are tempted to clean your finds in the field, you risk causing damage, lowering the amount of information they can give us about our past, and reducing any financial value.

Out of your depth?

Most of the time you will come across single isolated items and in these cases digging up and recording your find is often simple. However, you may be lucky enough to find a large group of objects of significant archaeological importance. These groups can often be complex or fragile and are easily damaged if lifted without special equipment and training. Archaeologists often call in a conservator to help with recording and lifting in these cases.



- If you are unsure of what you have uncovered, contact your FLO for help.
- You might want to take a photograph of the objects in the ground, then cover the object, for example with a plastic bag to act as a marker and refill the hole whilst you wait for help. Don't forget to record the find-spot though!

Special Environments

- Wet versus dry: As a rule of thumb, keep wet objects wet, and allow damp objects to dry out slowly.
- If searching in wet environments such as riverbanks, bogs or beaches, you need to consider what other materials you might find. Ancient and rare organic materials such as wood, leather or even textiles can survive for thousands of years in sealed waterlogged deposits. When brought into the air attached to a metal object, they begin to dry out and can shrink or fall apart.
- If out detecting in these environments it is often best to seal your object in a non-perforated plastic bag straight away with a little water until you can be certain you will not be damaging something important.
- Be aware that anything found in the sea or washed ashore from tidal water must be reported to the Receiver of Wreck (ask your local museum or FLO for details).



Packing and Storage

Protecting your finds

Metal finds need to be cared for. Excavated finds may have lost much of their metal content in burial. Some may be fragile, thin, brittle and easily broken. Others might be very heavy, and need extra padding. Different metals corrode in different ways; gold hardly corrodes at all, whilst iron corrodes quickly.



Some objects are made of more than one metal or contain other materials like glass, enamels, wood, bone, ivory, horn, leather, or textiles. You will need to think about specific requirements for these objects.

Your FLO can demonstrate some of the special packaging and storage materials you might need and can show you a DRY BOX to protect your finds from corrosion.

Bags, boxes, padding, markers and labels

Conservators have tested a range of supplies to see how well they withstand long term storage and handling. Materials which do not fade, fall apart, or produce acids or gases as they age have been selected. These materials are sometimes called 'archival'.

- Using robust containers and permanent black markers is important.
- Mini-grip bags with write-on strips and a Jiffy foam insert are good for most finds. Fragile finds are best packed individually in small clear plastic boxes.

- Acid-free tissue paper or polythene foam is recommended for cushioning your finds. Avoid cotton wool, it may stick to the corrosion and be difficult to remove, and foam rubber can give off sulphur and tarnish silver. Textiles like velvet and felt can do the same.



Biro was used on this bag, but it has faded and the label is lost



Paper and card age, but Tyvek® labels and Artline® pen survive



Recommended packaging materials:

- Polythene grip-top bags with write-on strips – remember to punch holes to ventilate!
- Spun-bonded polythene labels (e.g. Tyvek®)
- Permanent black markers (e.g. Artline® pens)
- Airtight polythene boxes (e.g. Stewart®)
- Clear polystyrene boxes for individual finds
- Acid-free tissue
- Polyethylene foam (e.g. Jiffy® foam) – not household foam rubbers
- Closed-cell Polyethylene foam (e.g. Plastazote®)

Contact your FLO for a list of suppliers

Storage environment – Relative Humidity

Corrosion requires oxygen and moisture to progress. If you can exclude either of these, metals will survive for a long time. It is easy to create a dry environment for your finds.

On site: Make sure the plastic bag has holes to prevent condensation. Dry out your finds gently when you get home. Avoid radiators and ovens, as the sudden change can damage your finds.



Condensation in sealed bag

Storing your collection: Pack the dry find in a perforated bag with Jiffy foam to protect it from knocks, and store the bags in an airtight container with silica gel and an indicator strip.

Silica gel is a crystal that absorbs a certain amount of moisture. Once it has absorbed that amount it has to be dried out again to keep working. Don't leave the

Dry Box open, or your gel will quickly become exhausted. How can you tell that it needs refreshing?

An **indicator strip** will turn pink when the gel isn't working. It shows the current level of moisture in the air (relative humidity, RH). Iron needs to be kept very dry (less than 15%RH), so no pink should be seen at all. Other metals will be fine at that level too, but it is too dry for glass and organic materials like leather and wood. You can dry the gel out yourself following the instructions, but your FLO may be able to arrange to have the bags dried for you. There may be a charge for this service.



Storing different metals

- **Iron** corrodes most easily. It has to be kept dry at less than 15%RH to prevent rusting. Active corrosion is indicated by bright orange powdery crystals or little droplets of 'weeping' iron. In this photo the iron object was not kept dry; the corrosion absorbed moisture from the air and formed an acid liquid 'weeping iron' which attacked the label, staining it and causing it to disintegrate. Orange iron-stained tissue paper is a common sight and indicates an urgent need for dry storage.



- **Copper alloy** should also be kept dry. Corrosion can begin again above 35%RH. 'Bronze disease', a particularly damaging form of corrosion, can be kept

from getting worse by dry storage, but it progresses quickly when moisture is present. If you notice pale green powdery corrosion spreading, the find may need chemical stabilisation. A conservator can check this for you, and treat if necessary. You can arrange this through your FLO.



- **Lead** and **Pewter** form white powdery corrosion in contact with paper, cardboard and wood. Even the gases given off by paper and card can cause corrosion, so keep these metals away from cardboard boxes. Lead is a poison which can be absorbed by your skin – wear gloves when you handle lead finds. Don't brush off the white powder; it is bad for your health!

- **Silver** turns black (tarnishes) when sulphur reacts with the surface. Air pollution, handling, and chemicals in some textiles can make this worse. Wear gloves if you handle silver.

- Excavated silver can be very brittle and cracks easily; handle with care.

What Next?...Assessment

What have you found?

Composition: modern metal detectors can give some indication of what metal you have located, but if you pick up objects field walking you may have to rely on traditional methods of identification:

Gold is usually recognisably yellow and in good condition



Silver can be bright shiny metal, tarnished (black), or covered in bumpy purple-grey corrosion.



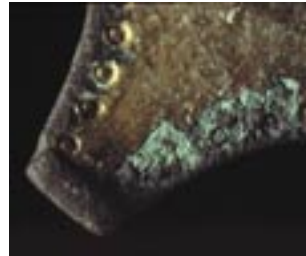
Green corrosion indicates some **copper** content. But beware: when silver or gold are present, the copper corrodes first and the silver or gold will be covered in green corrosion.





Brown lumps with a heavy covering of soil: try a magnet, **iron** usually responds to it.

- Watch out for additional materials, such as inlays or plating, they can be fragile. Handle with care.
- Watch out for attached ‘organic remains’ like bone, antler or ivory handles, leather straps, wood remains, or textiles. These may be stained green or brown from corrosion.
- Look under a magnifying lens or microscope to see more. You might want to keep a record of what you see, describing the soil type and what the corrosion looks like.

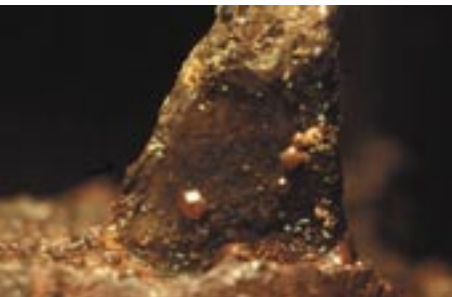


Fragile gold plating

You can talk to experienced detectorists and look at reference books to learn more about your finds; SPEAK to your FLO, they can help to identify what you have found.

Does it need treatment?

Active corrosion: if you see these signs, store your find in a dry box. This should be enough to prevent further corrosion. Most finds need no active treatment, but if problems still persist, consult your FLO who can put you in touch with a conservator.



Iron corrodes most easily. Active corrosion is indicated by bright orange powdery crystals or little droplets of ‘weeping’ iron. This corrosion will carry on, causing the find to split into many fragments unless it is kept dry at less than 15%RH.

Copper alloy: Active corrosion is pale green and powdery. Store the find dry. Consult a conservator if the corrosion continues or the find is fragile, it may need chemical stabilisation and consolidation: these are jobs for the professional!



But it’s covered in soil and corrosion... shouldn’t I wash it?

Do not clean Treasure finds (The Treasure Act 1996 Code of Practice advises finders that they should not clean finds, as this might damage archaeological evidence and may reduce the award paid). Conservators will ask you not to wash most archaeological finds; this is because it can cause harm by introducing moisture, causing further corrosion, and damaging fragile remains such as loose metal plating, inlays, and associated textiles or organic material. Surrounding soil can contain evidence of the burial environment. However, many metal-detected finds are from disturbed ground such as plough soil and have only survived because they are quite robust. Often finds are fairly modern, some are collectibles like buttons and badges, and others are agricultural, like horseshoes. In these cases careful washing can be carried out.

- Rinse the find gently in a plastic bowl of clean water to avoid losing small fragments; if necessary use a soft brush to remove the soil. Avoid leaving the finds to soak.
- Wash each find individually.
- Change the water if it gets cloudy. TAKE CARE – be alert to any fragile remains.
- Leave the finds to dry at room temperature (sudden heat can cause cracking) and pack them in your dry box as soon as possible, to prevent corrosion.

What about X-rays?



Occasionally radiography may be recommended by your FLO when the detail on a find is obscured by corrosion. X-raying is used routinely to reveal valuable information from archaeological iron finds, but is also very helpful for copper alloy and other metal objects,

especially coins. Details of decoration and construction can often be seen, and weak areas are shown without the need for cleaning. FLOs can arrange radiography for you but there may be a charge for this service.



This iron lump was a padlock with decorative strips brazed on

What should I do?

Consult your FLO – and Report Finds

Take **A**dvice **B**efore **C**leaning.

Stabilizing metals: Dry storage is usually sufficient.

Remember – incorrect cleaning and treatment can reduce the value of your find, seriously damage, or even destroy it.

Cleaning and Protecting

Take Advice Before Cleaning

Show your finds to your nearest FLO, who will help identify them and advise you on good practice. Once you are certain the find is not Treasure you can decide what to do next. A professional conservator might not charge as much as you think. You can find an accredited private conservator through the **Conservation Register** or through your local museum.

Some of your finds will be collectibles, such as livery buttons, pilgrim badges, hammered coins and tokens; others may be agricultural in origin, like horseshoes and harness fittings. As a rule of thumb, the older the item, the more heavily corroded it will be, and many ancient objects made from copper alloy will have developed a patina which adds value and beauty to the object. Removing this patina could seriously damage and devalue the object and lose information. But many of your finds will be fairly modern, like milled coinage, watch-fobs, penknives and other casual losses. These more recent items can mostly be cleaned carefully without them coming to harm but there are no ‘quick fixes’!



Cleaning by hand is the best way to remove thick corrosion layers, working with fine hand-tools and with the aid of a low-power microscope. Use sharpened wooden or plastic points such as cocktail sticks and artist’s brushes to remove loosened soil. Practice first with scrap objects until you get experienced at it, as much skill and practice is needed to produce good results. Don’t

use barrelling, wire brushes or other harsh methods – they will only cause damage. Remember, the purpose of cleaning an object is to reveal the original surface detail. This surface may be within the layers of corrosion and no longer be metallic.

Many metal corrosion products are poisonous, so wear a dust-mask and disposable gloves, especially when cleaning lead alloys.



Silver plated button cleaned with silver polish (wadding)

Chemical cleaning should only be used to remove tarnish from more modern objects where the original surface is well-preserved. Always remember that chemicals can be dangerous to you and your finds and great care should be taken in their storage and use at home. Chemical reactions cannot easily be controlled and some chemicals may remain in the object and cause problems

later. Even lemon juice and vinegar are chemicals and can cause damage to metal surfaces. Use only materials designed for the job.



Right: Damage to silver short-cross penny through over-cleaning with sodium hydroxide (caustic soda)

If you must remove tarnish from silver, polish brass items, and remove the rust from your ironwork, then there are lots of proprietary products available at hardware stores. But be warned: none of these products are conservation-grade materials, and you use them at your own risk. When undertaking chemical cleaning:



- Watch out for additional materials, such as inlays or plating, they can be fragile.
- Watch out for attached 'organic remains': Don't let the chemical product come into contact with bone, leather, wood, textiles etc.
- Wash off any chemical cleaning agent from your object very thoroughly after use.

Joining: For objects in fragments that need joining, it is important to find the right adhesive for the particular material. Adhesives used with artefacts should ideally be reversible, so you can easily undo the join using a solvent if you make a mistake. For corroded metals, use a recommended reversible adhesive, such as 'Paraloid B72' or 'cellulose nitrate' from a specialist supplier. Never use super-glues as they can be chemically unstable, and are difficult to apply and control. If a stronger joint is required for a large or heavy object, you may have to resort to an epoxy adhesive, such as Araldite®. If you do use an epoxy, make sure it is of good quality and the right sort for joining metals. But remember: you may never be able to undo it again! Never solder or weld objects; any process involving heat will change the metal's structure and obscure detail.



Coatings are commonly used both to protect and enhance the surfaces of objects. But a surface coating is seldom really necessary for protection if you are handling your finds correctly and storing them in a 'dry box'. If you must apply a coating to your finds:

- Don't use domestic waxes, oils, petroleum jelly or shoe-polish – they all contain potentially harmful contaminants
- For bright metal surfaces, use an appropriate lacquer, such as 'Incralac'
- For corroded metals, coatings can be used to consolidate a fragile surface. Use a conservation-grade resin solution, such as 'Paraloid B72'
- Make sure you read instructions carefully, especially health and safety advice, before using any specialist materials.

Restoring: This is the process of filling holes and gaps or making up spare parts for an object which are missing. If carried out in such a way that the restoration is invisible, it amounts to faking, which is both misleading and dishonest. If an object is damaged, then this is part of its history. It is better to leave it alone and let it tell its story without intervention!

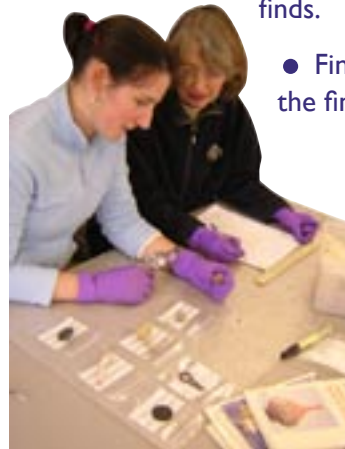
'*Conservation for Metal Detectorists*' will give you further advice on both mechanical cleaning techniques and on the use of specialist chemical cleaning reagents and surface lacquers, along with a list of suppliers, health and safety and other important information.

Displaying and Collecting

Showing off your finds

Everyone wants to show off their latest finds, or collections of prize objects. These 'outings' are probably the time when most harm can come to your finds. Here are some tips to avoid the worst types of damage:

- When taking finds out of their packaging, do this sitting at a table with a soft covering so that, if anything drops, less damage is done and nothing is lost
- Keep direct handling to a minimum; pass finds around for inspection resting on their packaging and preferably in a shallow container
- It is 'good practice' to wear disposable gloves when you are handling finds directly – this avoids salts and oils from your skin contaminating your finds, and corrosion from your finds getting on your hands.
- It is safest not to eat, drink or smoke whilst working with your finds.
- Finally, take care to see that any labelling kept with the find isn't misplaced during shows and outings.



Some of these problems are solved by using shallow plastic lidded trays with different sized compartments. These are available from detectorists' and other specialist suppliers. It's best not to use these for permanent storage of finds unless the materials they are made of are of archival quality.



Framing and mounting

Many people like to mount their finds in box-frames, either to hang up or to take out to shows and meetings. Kept like this, the box-frame effectively becomes the permanent storage for these finds, so:

- The materials the box-frame is made from should be of 'archival quality' materials or tarnishing and even corrosion may result.
- Box-frames are not airtight, so only very stable objects that are not likely to corrode through the presence of moisture should be stored/displayed like this.

- Because box-frames will be hung vertically, finds will need to be fixed in position. The best way is to line the frame with 'plastazote' (polyethylene) foam sheet of a thickness to fill the frame up to the glass. Mark out the shapes of the objects to be mounted, and cut out the shapes to the depth necessary to receive each item. You can also fasten objects in place using either nylon fishing line or plastic covered pins. Don't use 'blu-tak', modelling clays, tapes or adhesives, or any other type of plastic foam sheet.



Refer to '*Conservation for Metal Detectorists*' (see Further Reading) for more information on mounting techniques.

Labelling and recording

Everything in your collection should be labelled in some way, so you know when and where it was found. Here are some suggestions:

- If your collection is stored in polythene grip-top bags as recommended, labelling can be on the white panels on the front of the bag
- If you keep your objects in trays or box-frames, a label can be cut from 'Tyvek®' to go under the find
- A neat way to keep a record is to catalogue your collection, either in a loose-leaf file or using a computer database. Whichever you use, it is important to include a good photo or two. Then you can add notes on identification, find spot, conservation details, other examples etc. If you want to learn more, speak to your local FLO.



Your collection and the future.....

Occasionally it is a good idea to think about what you would like to do with your collection in the long-term. As your interests develop and change, you may wish to dispose of parts of your collection. Also it might be worth thinking even further into the future, and consider how you would like to deal with your collection under the terms of your will. By selling, donating or bequeathing it to a museum, you would ensure that your collection would be kept together for others to enjoy and learn from. Your FLO will be happy to discuss these issues and offer you advice, in confidence.

If you follow the advice in this booklet, you will have helped to preserve your collection in good condition for future generations.

Further Reading

First Aid for Finds by D.Watkinson and V. Neal, Rescue and United Kingdom Institute for Conservation Archaeology Section, 3rd Edition 1997. £16

Guide to Conservation for Metal Detectorists by Richard Hobbs, Celia Honeycombe & Sarah Watkins, Tempus Publishing Ltd 2002. £10

Beginner's Guide to Metal Detecting by Julian Evan-Hart & Dave Stuckey, Greenlight Publishing 2004. £9.95

Websites:

National Council for Metal Detecting:

<http://www.ncmd.co.uk>

Federation of Independent Detectorists:

[http:// www.fid.newbury.net](http://www.fid.newbury.net)

Portable Antiquities Scheme (Conservation):

http://www.finds.org.uk/conservation*

United Kingdom Institute for Conservation of Historic and Artistic Works:

<http://www.ukic.org.uk>

Conservation Register:

<http://www.conservationregister.com>

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To be supplied

Other Publications from PAS??

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