

Hazards in museum collections

A Collections Care *How To* Guide



Hazards in museum collections: a Collections Care *How To* Guide
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Hazards in museum collections: a Collections Care *How To* Guide

This *How To* Guide is one of a series of collections care guides published by Norfolk Museums and Archaeology Service in partnership with the Collections Trust. It provides an introduction to the recognition and management of hazards in museum collections, and is a starting point for managing associated risks. The guide covers some of the most commonly occurring hazards in museum collections and points you to other resources where you can find out more.

What do we mean by hazards?

'Hazards' in the context of museum collections care, refers to materials occurring in collections which may pose a risk to the health of those working in the museum, or to visitors, or to the collections themselves. The term is also used to refer to the fabric of the museum building, or to substances used in the maintenance of the building, however this guide focuses specifically on hazards occurring in collections.

Managing hazards in collections

It is important to be aware of hazards, so that you can assess the risks that arise from them and take appropriate action. Remember however, that the first rule of managing risks from hazards is 'Don't Panic'. Where hazards do occur they may often be in minute quantities and will have been in the collection for many years. So, be aware, understand what action you can take to minimise risk, and seek further help if you have concerns.

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Hazards in museum collections/

Museum collections come in many shapes and sizes with objects dating from prehistoric times to the present day, and involve a tremendous range of materials, often from all over the world.

Hazards in collections usually result from three main sources:

- *The nature of the material*, for instance naturally radioactive minerals in geology collections, residual diseases in human and animal remains, poisons applied to arrows for hunting.
- *The way materials deteriorate over time*, such as nitrate film used into the 1950s which becomes extremely flammable, or worn asbestos ceiling panels.
- *Procedures carried out on objects in the past*, for example many natural history

and ethnographic collections were heavily treated with pesticides.

The sheer range of materials and scale of collections can make it difficult to identify and understand the hidden risks they pose. So, it is useful to group the most commonly occurring hazards and identify the types of collections where they may be found. Be aware that there are legal requirements regarding the keeping of items such as firearms and the disposal of materials such as asbestos. See 'Where can I find out more?' at the end of this guide, and always seek specialist advice if you are unsure.

Hazards which may be present in museum collections

Pesticides

In the past many collections, especially furs, feathers, textiles and ethnographic objects, were treated with pesticides to help prevent insect damage. A wide range of toxic chemicals were used including DDT, arsenic and mercury based compounds, and museums rarely recorded which chemicals were used. Chemical residues can remain on objects, so it is safer to assume that well preserved fur, feathers, textiles or ethnography HAVE been treated with some form of pesticide.

Chemicals and toxic elements

Objects can incorporate a range of chemicals and toxic elements, such as mercury and lead. Taxidermy specimens were frequently prepared using dangerous



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Many taxidermy specimens were prepared using toxic chemicals which can still pose a health hazard. A tawny owl (*Strix aluco*) taxidermy specimen from the collections of Norfolk Museums and Archaeology Service

chemicals, including arsenic and mercury based compounds, to preserve the skins. Fluid preserved collections, such as 'wet' biological specimens in glass jars, also

may involve a toxic or flammable liquid. Historic pharmacy collections are another source of a wide range of potentially harmful chemicals, drugs and other preparations. Social history and scientific collections may contain mercury or lead.

Mould

Many collections can develop mould when the atmosphere is too humid, which can cause problems if inhaled.



Mould on feathers

© Colchester & Ipswich Museums Service

Asbestos

Geological specimens may be composed of asbestos. Other objects can include asbestos, for instance ironing boards, protective clothing such as gas masks and fire suits.

Radioactive materials

Geological collections can be particularly rich in naturally occurring radioactive minerals, which contain radioactive elements including uranium. For example one regional museum holds specimens of twenty different radioactive minerals. These emit radiation which can be a health hazard to most living things. Man-made objects may also contain radioactive minerals, for instance early luminous dials on watches and mechanical equipment in



Human remains can harbour dormant diseases

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Desiccated finger from the Bargarve Collection, Canterbury Cathedral Archives

social history collections.

Biological hazards

Some objects can harbour dormant diseases such as smallpox and anthrax. This may occur in human and animal remains, blood and manure deposits, wattle and daub, and animal skins which have not been fully processed into leather, as in many ethnographic collections.

Firearms and explosives

Many collections include guns and munitions from different historic periods. Some firearms may be disabled, whilst others may be in working order and contain residual gunpowder. Fireworks have sometimes been collected and may also include the original gunpowder.

Plastics, including nitrate film

Early cinema film, for example pre 1950s nitrate film reels are extremely flammable and, when contained within metal reel cans, risks building up dangerous levels of explosive gases. As some types of plastics age they release chemicals called plasticisers as sticky deposits on the surface of the object. Some are toxic, others give off acidic gases which can accumulate in closed boxes.

What are the risks to people?

Hazards in collections can pose a risk to people mainly because they can be absorbed by the body in a variety of ways.

Inhalation

Surface deposits of toxic chemicals and hazardous dusts or mould can be breathed in, especially when objects are being handled or cleaned. Damaged, aged and crumbly materials, such as old asbestos, can be very problematic. Some materials give off gases as they age which can also be inhaled. It is also possible to inhale radioactive dust and to swallow contaminated food or water.



Mould growing on ivory which could be breathed in during cleaning.

National Trust, Ivory casket from the Scarsdale Collection at Kedleston Hall

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Absorption through the skin

Some materials will pass through the skin when objects are touched and enter the blood stream. The sticky residues from degrading plastics and leaking fluid from preserved collections are examples. Chemical residues such as naphthalene in moth balls can enter the body in the same way. Radioactive sources, such as naturally occurring mineral specimens, emit radiation which is able to pass through the skin. Storage materials, such as tissue paper and boxes, can absorb radiation, acidic vapours and pesticide residues, adding to the hazard.

Ingestion

Handling objects and then handling food or touching your face/mouth with unwashed hands can lead to potentially dangerous materials being swallowed. Dormant diseases which can be present within human and animal remains can be reactivated if dust or other debris is breathed in or swallowed.

What are the risks to the collections?

Hazards in museum objects can also pose a risk to the collections themselves. The main concerns are:

Increased risk of fire

Fluid preserved collections may contain flammable liquids. Nitrate film is extremely flammable and once ignited cannot be extinguished. Firearms and explosives may contain explosive or flammable residues or be accidentally fired.



© Colchester & Ipswich Museums Service

Contamination

As some materials deteriorate, particularly plastics, they can accelerate the decay of other artefacts, for instance other plastics may become opaque, crazed or sticky and metals may start to corrode. Objects may also become contaminated by dust, fragments and gases, spreading the risks to other objects and ultimately to people.

Assessing hazards

- Look for the signs of potential hazards
- Always carry out a risk assessment to establish the main risks to your collection

Managing hazards

- Plan and prioritise how you will manage the hazards you have identified, and share your plans with colleagues
- Establish good working practices
- Seek specialist advice if you need it

Do...

Do remember that in the majority of cases the level of exposure to toxic materials will be very low.

Do get specialist help if you suspect you may have radioactive materials, damaged asbestos or nitrate film in the collection. A conservator, curator or other specialist will be able to identify them for you and give advice on measures

you can take to minimise risk.

Do follow Health and Safety Executive guidance at all times.

Do make sure everyone who comes into contact with the collection follows basic good hygiene practises:

- Never eat or drink in a collection area
- Always wash your hands after handling any objects
- Wear nitrile gloves to handle any objects where there may be a risk

Do make sure people know which objects pose a risk:

- Identify the objects involved
- Use a labelling system on the objects and boxes containing them
- Update the collection data-base

Do restrict access to suspect objects and minimise handling and use, until you have sought advice.

Do make sure that no potentially hazardous objects are accessible to the public in open displays, handling collections or school boxes.

Do check regulations or get specialist advice before disposing of hazardous materials or contaminated packing.

Do look out for signs which may indicate problem objects, such as white powders or crystals on surfaces, leaking bottles, batteries, discoloured and brittle packing materials or sticky droplets on plastics.

Don't...

Don't panic! Most of these hazards will have been around in the collection for many years. You have time to plan and prioritise improvements.

Don't think you have to know what every material is before you can take action. Use simple precautions such as clear labelling and reducing handling to minimise risks to people's health even if, for instance, you don't know what an historic pharmacy collection contains. Then seek advice.

Don't undertake activities which generate or disturb dust where you suspect a hazardous material.

Don't be complacent; hazards will not just go away and ignoring them could result in serious illness or injury as well as breaking the law.



Where can I find out more?

More about managing hazards

There are many sources of information about hazards in museum collections. The following are good places to start:

Don't Panic: Dealing with Hazardous Materials in Collections, Institute of Conservation, Birmingham Museum & Art Gallery, November 2006. Notes from the meeting are available at - http://www.icon.org.uk/index.php?option=com_content&task=view&id=74&Itemid=

Fluid preserved collections - Natural Sciences Collections Association website - <http://natsca.info/content/fluid-collections>

Working with Substances Hazardous to Health. 2009. Health and Safety Executive - <http://www.collectionslink.org.uk/discover/environmental-control/842-working-with-substances-hazardous-to-health-coshh>

More about legal requirements

Legal requirements - Natural Sciences Collections Association website - <http://natsca.info/content/policies-legislation>

Firearms and the law - http://clbeta.org.uk/media/com_form2content/documents/c1/a287/f6/FirearmsandtheLaw.doc

Human remains guidance - http://www.culturalpropertyadvice.gov.uk/public_collections/human_remains

Historic pharmacy collections and controlled drugs - The Royal Pharmaceutical Society provides a wide range of information on the care of historical medicines - <http://www.rpharms.com/learning-resources/information-sheets.asp>

Disposal of hazardous waste including asbestos & radioactive materials- Environment Agency website - information, guidance and registration. <http://www.environment-agency.gov.uk/business/topics/waste/32180.aspx>

Do I need advice from a conservator?

This guide has introduced you to the identification and management of hazards in collections. You may come across hazards which require more specialist advice. If in doubt, always consult a conservator. Conservators are listed on the ICON Conservation Register.

ICON Conservation Register at <http://www.conservationregister.com/>

