

Care and conservation of zoological specimens

This leaflet provides general information about the care of zoological collections and how to prevent, notice and manage some of the more common problems.

Zoological collections include:

- **Entomology collections:** pinned and card mounted insects
- **Spirit specimens:** animals preserved in fluid
- **Taxidermy specimens:** mounted (stuffed) animals
- **Study skins:** skins of animals, not mounted
- **Dry material:** shells, skeletal material, bird eggs, corals, etc.
- **Microscope slides:** animal parts, small insects, etc.

Setting the right environment

Storing zoological specimens in the wrong environment may give rise to damaging problems. Many collections contain dried tissue and skin which attract insect pests. Tell-tale signs include small piles of dust under the specimen (frass) and the shed skins (casts) of the growing young stages of the insect pests. Dry material, such as bone, shell and coral, is more robust but can still be damaged by different factors.

Exposure to ultra violet (UV) light in daylight and artificial light causes pigment in specimens (including taxidermy) to fade. Warm environments can cause the release of residual fats in skins resulting in hair/feather loss. Very dry environments can cause cracking or delamination of specimens such as turtle shells, horn, and bone. (Delamination occurs when the horn/bone begins to flake away in extremely thin layers.)

Bone can swell and contract with variations in relative humidity (RH). Where fluctuations are too rapid or severe the bone can split and break apart. This type of fluctuation is often caused by excessive levels of lighting in showcases being switched on and off daily. Low RH particularly affects teeth, causing them to crack and flake.

Damp can cause a number of different problems:

- Pests: thrive in damper environments.
- Mould growth: releases enzymes which break down organic matter.
- Verdigris: copper and brass pins used in entomology collections can break down and react with the fats inside an insect's body. This can lead to the growth of blue-green, hair-like verdigris crystals on the pin. These can grow through the specimen, eventually breaking it apart.
- Byne's disease: wooden drawers holding dry collections of eggs, shells or bones may release volatile organic compounds. In even a slightly damp atmosphere, these compounds react with the specimens and cause an acidic crystalline growth that can be gradually corrosive. Bird eggs and mollusc shell collections are particularly vulnerable to this problem.

Care of Collections

The Store Room

All collections should be stored in secure, environmentally-controlled conditions. To minimise deterioration, keep specimens away from light sources. Store rooms should be kept at a stable relative humidity (RH) level of between 45% and 55%. This may require a humidifier or dehumidifier. Temperature levels should be as stable as possible, between 10°C and 22°C.

Store rooms are never completely immune to pests. Most pests will lay eggs inside specimens and the young stages (larvae) will cause the most damage. Pests can be reduced by regular vacuuming and cleaning of the stores and banning food and drink from the area.

Pests can be monitored with insect traps (such as the sticky trap). Quarterly checks of the traps will show the types of pests entering store rooms. Inspect your collections at least twice a year to monitor for any pest activity. March and April (in the UK) through to the hot months are the most likely periods to locate pests, especially if RH is high.

Storage

One of the simplest and safest ways to reduce pests in entomology collections is to seal the



Photograph: Simon Moore

Insects grouped in a box; reproduced with the kind permission of the National Trust, Overbeck's (Devon)



Photograph: Simon Moore

Dome of mice; reproduced with the kind permission of the National Trust, Calke Abbey (Derbyshire)

Find a conservator by using the conservation register

The Register is free to use; it provides detailed information on conservation-restoration practices based in the UK and Ireland including contact details, referenced examples of previous work and the qualifications of members of staff. It is searchable by specialist skill and geographical location and each business has been required to meet rigorous criteria which include professional accreditation of the lead conservator of the business; the information is regularly updated.

www.conservationregister.com



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specimen drawers tightly. This will prevent most pests from crawling inside. Slightly drier environments (a lower RH) can cause wood to shrink, providing gaps for pests. Older collection cabinets were not made to be air tight and may need additional monitoring.

Dry material can be stored in clear polystyrene lidded boxes, nested in acid-free tissue paper. These provide protection from dust and allow the specimen to be seen, reducing the need for handling it.

Taxidermy specimens should be stored in closed cupboards to prevent dust build-up and reduce the risk of pests. Study skins should be stored in sealed cupboards. Both types of collections should be monitored regularly for pest activity.

Safe Handling

Wearing disposable nitrile gloves will eliminate any transfer of skin oils and perspiration to specimens. Taxidermy specimens before 1980 may have been treated with arsenical soap (sometimes noticeable as a fine white powder). Always handle specimens with gloves, and if cleaning them, always use dust extraction/fume cupboard and wear a dust mask.

Pinned entomology specimens are normally handled using specialised curved and gripping forceps. Old specimens can be very dry and brittle and pins may be corroded; remove specimens from their drawer very slowly and carefully.

Dealing with Pests

Pests can be treated by one of the following methods:

- Freezing: place the specimen inside a clear polyester bag, push out excess air and heat seal, or place inside polythene bags and use parcel tape to seal. Place the bag in a normal domestic freezer for at least 14 days at a temperature of -18°C or for 72 hours if freezing at -30°C.
- Insecticide: 'Constrain' is one of the few permitted chemicals to control insect pests in museum collections. Always follow the instructions.
- Anoxia: this method starves the pests of oxygen. Small anoxic environments are created using sealed barrier films (such as Marvelseal™ or Escal™ or re-usable aluminium laminate) and placing oxygen scavengers and RH buffers inside before sealing.

Basic Remedial Conservation

Any treatment carried out should be fully documented to provide a record for future conservation and/or research of the specimen. If you are unsure about a treatment, contact a conservator or curator for advice.

- Byne's disease: can be detected by the smell of vinegar. Mollusc shells can be gently brush-cleaned using a soft brush with deionised water. Once cleaned, the specimens can be soaked in deionised water overnight, and then placed on blotting paper to dry completely.
- Cracking: dry horns and animal muzzles that are starting to crack can be treated with a conservation-grade beeswax-based polish, providing a barrier against further dehydration.
- Spirit Collections: check the fluid levels in jars annually and that fluids are not discoloured or contaminated. Advice should be sought about topping up. Fragile or loose labels can be archived in polyester envelopes and the data recorded onto new labels, using pigment ink, to be stored inside the jar. If you do not have the equipment to work on conservation problems for spirit collections, contact a conservator or curator for advice.
- Microscope slides: specimens have often been mounted in short-term mounting media which can rapidly deteriorate by contracting, darkening or crystallising, thus destroying the specimens. Slides should be checked annually and, if serious deterioration is noticed, a microscope slide conservator should be contacted. Slides can be cleaned of surface dirt using cotton wool swabs or buds dampened with deionised water.

Many of these problems arise from poor storage conditions. Basic remedial conservation can be carried out on affected specimens but the storage will need to be reviewed. Placing specimens back in the same storage will cause the same problems to recur.

Seeking further help

Zoological collections include a wide range of specimens, which can have a variety of problems. If you notice something which you are unsure about, please contact a specialist conservator or curator for advice. If you cannot find help locally, contact the Institute of Conservation or the Natural Sciences Collections Association. Museums and county or regional Museum Development Officers can also provide help and advice on all areas of collections care.

Other natural history leaflets in this series:

Care and conservation of geological specimens

Care and conservation of botanical specimens

Suppliers:

Constrain: www.historyonics.com

Escal™: www.csconserv.co.uk

Conservation packaging and materials can be purchased from:

Conservation by Design www.conservation-by-design.co.uk

Conservation Resources Ltd:

www.conservation-resources.co.uk

Preservation Equipment: www.preservationequipment.com

This leaflet has been produced in partnership with the Institute of Conservation (Icon) and the Natural Sciences Collections Association (NatSCA).

Icon, the Institute of Conservation

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