AN ALTERNATIVE PRESERVATIVE:

A COMPARISON OF KAISERLING III AND ALCOHOL SOLUTIONS

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Introduction

The majority of natural history spirit collections we have encountered throughout our working experience have been preserved in alcohol or formalin solutions. On a recent training course at the Royal College of Surgeons Hunterian Museum we were introduced to the Kaiserling three part method of preservation. Historically Kaiserling is used within medical collections while natural history collections favour alcohol or formalin methods of preservation.

We are interested in assessing whether natural history collections should consider adopting the Kaiserling method of preservation. Here we will discuss the pros and cons of both methods and consider whether Kaiserling is appropriate for use within our collections.

KAISERLING I
200ml formalin (37%)
30g potassium acetate
15g potassium nitrate
1000ml distilled water

KAISERLING II (optional)
80-95% alcohol (1-8 hours depending on the specimen) and/or 0.2% Sodium hydrosulphite can be added to the KIII solution immediately before sealing jar

KAISERLING III
20% glycerine (by volume)
10% anhydrous sodium acetate (by weight)
0.5% formaldehyde (37%) (by volume)*Optional
Distilled water

K III Pros

K III is generally lower in toxicity and less flammable than alcohol solutions

The rate of evaporation is far lower in comparison with alcohol

Staff time and maintenance involved in topping up are greatly reduced

K III can be stored in acrylic jars

Colour is maintained

Glycerine can inflate collapsed membrane structures to their original shape

Rhizostoma sp. preserved in Kaiserling III

K III Cons

Kaiserling Fixation - store for up to one month. Alternatively 10% Buffered formalin can be used

The osmotic pressure can cause shock to the tissue, this must be taken into account when transferring specimens which have been stored in alcohol long term

K III is viscous meaning that full fluid exchange can take a considerable amount of time, this means that it may be more suited to smaller specimens and membranous tissues

The total cost of the different components of K III is greater than alcohol

Alcohol Pros

The cost of alcohol preservation is considerably lower than the Kaiserling three part method of preservation

The methodology is simpler

Alcohol has a greater penetration effect meaning larger specimens can be preserved

Phyllopteryx equus preserved in 70% alcohol

Alcohol Cons

Alcohol has a bleaching effect on tissues

It has a high evaporation rate, which means it requires more maintainance and staff time

It reacts with any fats that are present causing discolouration

It is highly flammable meaning it needs to be stored in a intrinsically safe environment

It has a higher toxicity than the components of K III

It cannot be stored within acrylic jars

It can react adversely with many sealants

Due to the high rate of evaporation, the concentration of alcohol diminishes over time

Although transferring specimens from one preservative to another is not recommended, unless absolutely necessary, Kaiserling III could be considered where a specimen is desiccated or requires a significant level of topping up. In circumstances where alcohol cannot be used K III might be an option. Institutions which are actively collecting could perhaps consider K III as the preservative of choice. Although the cost of the components of K III is higher, this is negated by the overall cost of staff time and maintenance of the collection.

We would appreciate any feedback on this topic, please take the time to inform us of the methods used within your institutions and whether you would consider introducing Kaiserling III into your collections.

Thanks

Thank you to Martyn Cooke, Emmy Bocaege and Amalia Lempriere, the Royal College of Surgeons Hunterian Museum for their time and effort in running the Core Principles of Fluid Collection Conservation training course.

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INTELLIGENT USE OF VOLUNTEERS:

THE VOLUNTEER PROGRAM AT CAMBRIDGE UNIVERSITY MUSEUM OF ZOOLOGY

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Introduction

Cambridge University Museum of Zoology is currently undergoing a major 3 year redevelopment of both the stores and gallery spaces. This involves the packing and moving of over 4 million specimens into new storage facilities, as well as moving 5000 specimens out of the gallery into temporary storage while the gallery is being refurbished.

For the past 12 months we have been using a team of over 30 volunteers to pack up the specimens. During the recruitment process the volunteers are required to undertake a two day training course. The course is led by Cambridge University Museum conservators, and introduces the volunteers to all aspects of conservation. This includes Integrated Pest Management, the agents of deterioration, object handling, moving and packaging as well as conservation grade materials.

Over the course of the training they are judged on dexterity, handling and their approach to working with museum specimens so that we are able to guarantee suitable volunteers for the tasks involved. During their first weeks at the museum the volunteers are introduced to all aspects of packing zoological specimens, comprised of skeletal mounts, taxidermy, spirit specimens, fossils, corals and molluscs. They work closely with conservators and receive further training in condition reporting and remedial conservation.

Above: Volunteer training day
Below: Margaret Midwinter packing an Aardvark

Learn

We have a diverse group of volunteers ranging in age, backgrounds and locality. This gives us an unique opportunity to draw on their skills and experience. The museum has been able to develop and improve a number of packaging techniques thanks to the ingenuity and creativity of our volunteers.

Roger Hailey packing a Sawfish rostrum

Trust

Following the training the volunteers' confidence in working with the museum collection increases as they continue to develop their skills. This means the amount of direct support and guidance they need decreases and as a result there are very few tasks which are not suitable for volunteers. We have learnt to have considerable faith in the skills and abilities of our volunteers, even our most treasured specimens are entrusted to their care.

Charis Millett & Ann Blackman packing a Carribean Monk Seal

Enjoy

Each volunteer has their own individual reason for wanting to work with us, and many travel a great distance to do so. It is our job to cater to these individuals within the needs of our redevelopment. There are many tasks which are repetitive and monotonous, we strive to balance these with more 'interesting' tasks so that the volunteers remain engaged.

Denis Loughlin packing an Ocelot

Reflections

Cambridge University Museum of Zoology has now completed one full year of the volunteer packing project. During this time we have had three volunteer intakes resulting in the museum having trained over 40 volunteers, 30 of whom are still active. Over the course of the year the volunteers have donated 537 working days of their time which is the equivalent to £73,550 in HLF (Heritage Lottery Funding) match funding. In relation to the redevelopment the museum gallery has now been packed and there has been considerable progress on the packing of the spirit store. They are an integral part of the project and a vital resource in museum practice, not only that, we also thoroughly enjoy their company and appreciate all the hard work they do.

Thanks

It goes without saying that we are extremely grateful to all of our volunteers: they have been instrumental in the running success of the redevelopment project. Also thank you to Deborah Walton and Kirstie Williams, University Museums Cambridge, for developing and running the volunteer training course.

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BIRDS OF A FEATHER PACKED TOGETHER:

THE PACKING PROJECT AT CAMBRIDGE UNIVERSITY MUSEUM OF ZOOLOGY

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Introduction

Cambridge University Museum of Zoology is currently undergoing a major three year redevelopment of both the stores and gallery spaces. This involves the packing and moving of over four million specimens into new storage facilities, as well as moving 5,000 specimens out of the gallery into temporary storage while the gallery is being refurbished.

The museum's collections hold over 2,000 mounted bird specimens all of which have to be packed ready for relocation. The new storage facilities are based adjacent to the museum and this was taken into consideration in deciding our packing methods. The methods applied had to be quick, effective, non-invasive and economical. They also had to be suitable for both skin and skeletal mounts, varying in size, fragility and stability.

The Magnet Method

For smaller mounted taxidermy specimens, we used a method which was minimally invasive, allowed for low level contact between specimens and packing material, and was relatively time efficient. We used small magnets, powder-coated steel sheets and eurocrates to achieve this.

1. Secure steel sheet in appropriately sized eurocrate, using high quality heavy duty tape
2. Choose suitable specimens to place in the eurocrate, i.e. similar size specimens, particularly as to height, so boxes can be stacked
3. Arrange magnets on the base of the mounts making sure any historic data and/or labels are not obstructed. We typically used four 13mm diameter self-adhesive magnetic discs
4. The self-adhesive magnets are low tack so for added strength the magnets can be stuck on using a hot glue gun
5. Place specimens in eurocrate
6. Top heavy specimens can be further secured using cotton tape straps which can be attached to the sides of the crates

Pros

- Using the glue gun allows for a strong but reversible bond, the magnets being easily popped off with a scalpel with no residue
- The powder-coated steel sheets were made to order such that they easily fit the dimensions of the eurocrates
- The magnetic force is sufficient to hold the bird in place, but not so powerful to prevent removal

Cons

- The hot glue gun tends to produce fine strings of adhesive but if used with caution this should not be an issue

Custom Made Crates

For larger mounted specimens, we used a method which was also minimally invasive. Due to the size and weight of these larger specimens we made in-house wooden framed crates.

1. Measure specimens and prepare appropriately sized crates, allowing for packaging materials
2. Line the three sides and top of the crate with corex, and secure in place with screws and washers to pin down the corex. The edges can then be covered with tape to keep dust out
3. A corex door can then be made and screwed onto the remaining side.
4. Measure and cut a plastazote bottom to act as a cushioning base. A second layer of plastazote can be placed on top and an inset can be cut, into which the base of the bird can be positioned
5. Once the specimen is in place a combination of plastazote wedges, straps and cotton tape can be used to fit the specimen more securely

Pros

- Bespoke frames are made, meaning there are no size con straints
- There are five interior surfaces to use when securing the specimen in place
- The crates are strong yet lightweight in comparison with solid wooden boxes

Cons

- Making the crate frames is time consuming and relies on having an in-house workshop and someone who is trained to use it

Vicky measuring birds for packing

Natalie adhering magnets to base of bird mount

Specimens secured in place in custom made crate

Thanks

Thank you to Nigel Larkin for suggesting the magnet method, pioneered by Norwich Castle Museum (NSCG Newsletter Issue 19). Thanks also to Stuart Turner for his skill and hard work in the preparation of the wooden crates.

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THAT'S THE SPIRIT:

PACKING AND MOVING THE MUSEUM OF ZOOLOGY'S SPIRIT COLLECTION

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Introduction

Cambridge University Museum of Zoology is currently undergoing a major redevelopment of both the store and gallery spaces. The spirit store will be the only store to be refurbished, consequently the entire spirit collection of 18,000 jars will be moved into temporary storage facilities in a separate building while the redevelopment is underway.

To facilitate this all 18,000 jars need to be packed into eurocrates and immobilised during transportation. There are three main stages in the moving process all of which have thrown up interesting and on occasion unique challenges.

CHALLENGES

SOLUTIONS

The Permanent Store

1. Working environment & space constraints
2. Historical lack of documentation
3. Health and Safety
4. Ensuring the architects and contractors understand the nature of the collections, their fragility and hazardous properties
5. Conservation issues

1. Eurocrates are pre-packed in the store. We then move them to the gallery where there is more workspace and they are further stabilised
2. The majority of the collection is preserved in alcohol, but we also know that formaldehyde, phenoxetol, glycerin and other preservatives have been used
3. We have sought in our Risk Assessment and our provision of Personal Protection Equipment (PPE) to cater for all eventualities
4. We have developed a close working relationship with both the architects and contractors ensuring they understand the nature of the collection
5. All specimens in need of conservation are noted in condition reports which have been carried out on the entire collection. The specimens in need of urgent care have been separated and moved into the conservation lab

The Precarious Route

1. No step-free access
2. Construction site
3. Four boxes per trolley trip
4. Build up of packed boxes & time delays
5. Fragility

1. A custom built stair lift with a pulley system was made which allows us to lower the crates one at a time with relative ease
2. Appropriate PPE has been supplied and is worn at all times, and excellent communication has been maintained with the contractors
3. Where possible jars are packed according to height which allows the crates to be stacked and more than four boxes to be moved in a single trip
4. Because we have packed in such a way that crates can be stacked, we can store more crates in a given area
5. The upmost care has been taken to support each specimen jar. They are fully cushioned within the eurocrate and fully secured to ensure no movement occurs during transportation

The Temporary Store

1. Intrinsically safe store
2. No stacker & high shelves
3. Space constraints
4. Weight loading of floor

1. All electrical outputs in the new store are intrinsically safe. No electrical equipment can be used in the store e.g. the hydraulic stacker. A fire alarm system has been installed as well as air conditioning to prevent the build up of fumes
2. We can use the manual stacker to lift heavy specimens and those specimens which will be placed on the top shelves
3. The outermost shelving bays have been installed before those in the centre of the room. This will allow us to load these outer bays without the constraint imposed by the central shelving. Once these shelves are filled to capacity, the central units will be installed and loaded
4. Prior to moving an average weight of each bay was calculated. During the packing process the crates are weighed and labelled accordingly. This allows us to monitor the total weight being loaded into the new store

Reflections

Over the course of this project we will have moved 650 crates through a total of eight doors, one elevator, down one custom built stair lift, up five small stairs and across one car park. In total each crate will have been handled a minimum of seven times along the way. With a maximum of four crates on each trolley this means we will have to go this route 163 times!

Moving a large spirit collection is no small feat and comes with many challenges; however, with proper planning, communication and a lot of hard work it can be accomplished. We hope that we have addressed the many issues that come with moving this type of collection and provided suitable solutions which may guide you in the future.

Thanks

Thanks to Nigel Larkin for his help in the planning of the move, Ed Shepherd for fitting out our new temporary store and John Carter for his patience and the custom built stair lift.

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Caring for our primates:

Conservation of the Osman Hill wet specimen collection

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INTRODUCTION

Upon retirement, primatologist William Osman Hill (1901-1975) became a Hunterian Trustee at the Royal College of Surgeons of England, where part of his collection (over 1000 specimens) was bequeathed. This collection is currently split into dried, skeletal preparations, embalmed preparations and fluid-preserved preparations. The collection represents an important scientific resource containing several hundred examples of comparative anatomy. Within this unique collection, a wide variety of species, many of them endangered or under serious environmental threats, are represented.

THE PROJECT

A conservation project is currently under way aiming at the conservation, cataloguing and storage of this collection in order to safeguard its long term future. The focus is on the assessment and treatment of fluid preserved preparations, which are under the most serious threat of deterioration. This type of (multiple) materials presents a set of unique conservation problems, as both jars, lids, labels and specimens need to be assessed and stabilised.

PRESERVING WET SPECIMENS

The fluid-preserved collection consists of approximately 150 glass jars. The collection includes mainly primate material, ranging from neonates, juveniles to adults, all stored in 2% Formaldehyde. The contents of the jars vary, but in general each jar contains an eviscerated carcass with each organ wrapped in cheesecloth type material. In some cases there are multiple species in one jar.

CONDITION OF THE SPECIMENS

The bulk of the jars are still sealed with gradually corroding 'o' ring seals and poorly fitting clip on lids. The majority of the containers showed severe evaporation. Discoloration of the preservative fluid, caused by the leaching of lipid or natural pigments into the fluid, is another major issue.

FLUID TRANSFER

Formaldehyde is an excellent fixative. However, on long-term storage, the fluid oxidises, producing formic acid which can cause serious damage to specimens including bone decalcification and destruction of soft tissue. It is essential to incorporate buffers into formaldehyde solutions to maintain a neutral pH; these should be maintained on a regular basis.

The Conservation Unit currently uses a Kaiserling III solution, this was considered the most appropriate solution for long-term storage, as it is a safe, odourless substance. Specimens were washed in water and transferred into a formaldehyde neutralising solution. In a final stage, specimens were transferred to Kaiserling III.

LABELS

Over time, labels immersed in preservative fluid become softened and discoloured and are often found in a fragmented condition. As there was a severe danger of label disintegration, all written contents were photographed and transposed to replacement labels prepared using Resistall labels and a rotring pen. Labels were tied onto individual specimens if possible.

CONCLUSION

The project is still on-going, but selected specimens are already being incorporated into projects such as the Hunterian bicentenary fellowship (Dr Wendy Birch, University College London) and the research of Professor Bernard Wood (Centre for Advanced Study of Hominid Paleobiology). Once conserved, we envisage that the collection will be of major educational benefit in the fields of zoology, veterinary science, anthropology, human evolution and wildlife conservation.

Acknowledgements to Imogen Phillips (Specimen photography) and Anna Nicola (Help with fluid transfers)

Royal Botanic Garden Edinburgh

Pilot Condition Survey of RBGE Herbarium Specimens

The introduction of a rolling condition survey of mounted herbarium specimens was recommended in the 2010 RBGE Synthesys Self-Assessment Collections Care Report, part of the Synthesys project to improve standards of collections care in European natural history collections.

Overview

This pilot survey demonstrates that it is possible to integrate a basic level of systematic condition assessment of herbarium specimens into a digitisation workflow, making good use of limited staff time, and raising awareness of preservation issues.

In 2011-12, 8,302 specimens in the Zingiberaceae family were assessed, and where necessary given preventative care by Digitisation staff, or referred for remedial conservation treatments. The survey method was subsequently used to record the condition of specimens in the Gesneriaceae family; specimens from the Middle East, Chile, Argentina, Uruguay, Australia; and for selected collectors e.g.Erich Werdermann (1892-1959) and Robert Brown (1773-1858).

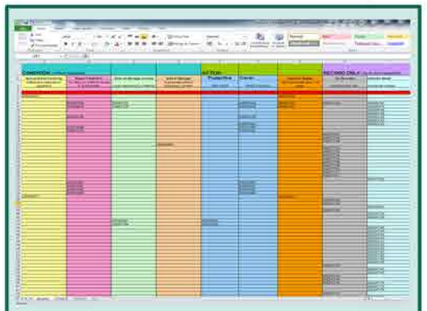
Survey Method

During imaging ...

...using a digital camera

... or flat bed scanner

...or while databasing specimens from a monitor...



...individual specimen barcodes are scanned into an Excel spreadsheet under "reporting categories". Barcodes are subsequently linked to the RBGE database

Royal Botanic Garden Edinburgh

Kate Eden, Herbarium Technician
Lorna Glancy, Herbarium Specimen Digitiser

Further information on the survey and conservation treatments can be obtained by contacting
Kate Eden: **K.Eden@rbge.org.uk**

JSTOR | Global Plants

Part of this survey was undertaken in association with the Global Plant Digitisation Project at RBGE funded by the Andrew W. Mellon Foundation.

The RBGE Herbarium

- Contains 3 million pressed and mounted plant specimens, dating from the 17th century, including 70,000 type specimens, and important historical collections.
- The specimens are used for taxonomic and floristic studies by RBGE science staff and visiting researchers; and may be loaned to other Herbaria worldwide.
- The collection is organised taxonomically according to APGII and housed in purpose built metal cabinets in a secure humidity and temperature controlled environment with a comprehensive IPM (Integrated Pest Management) system.

Reporting Categories

Non-Archival Material
cellophane or polythene

Paper Problems
too flimsy to handle or small sheets

Risk of Damage or Loss
loose attachment or material

Insect Damage
grazed specimens, droppings

Sent for Repair
specimen to be repaired by trained herbarium technician

Surface Dirt
including soot, dirt

Stained Sheet
insecticide residue

Staff training and communication

- Workshops were run to familiarise digitisation staff with the "reporting categories".
- Written guidelines for the survey method and use of folders and boxes were provided.
- Regular update meetings were held with a representative from the digitisation team, and feedback from other staff was actively sought.
- The close proximity of digitisation work stations to the herbarium technician responsible for remedial treatments facilitated clarification of individual specimen queries.
- A summary report highlighting the main condition survey issues for each completed survey was circulated to science staff.

Collections Care Priorities

RBGE's primary collections care priorities are

- to preserve the valuable information present in the specimens for future researchers; preservation = access
- to make this information more widely available through digitisation

Therefore survey priorities were to record

- actual or potential loss of plant material and/or label data requiring immediate remedial treatment
- handling issues requiring preventative measures
- potential degradation of plant material and/or label data requiring future assessment
- specimens with cellophane or polythene coverings which would hinder clear imaging.

Digitisation Staff Actions

- refer badly damaged specimens, and those with cellophane coverings to the herbarium technician responsible for remedial treatments

- use four-flap,archival paper folders with supportive backing boards for inherently fragile plant material and brittle (acid) mounts

- use grey archival card boxes for bulky material to reduce pressure points

- refer insect damage to the assistant curator with responsibility for IPM

- record insecticide residues for future health and safety assessment
- record surface dirt and soot for further assesment

- remove metal paperclips and pins, replacing with an archival brass one if absolutely necessary

Future Recommendations

- Monitor recording regularly to ensure standards are maintained.
- Replace Excel spreadsheets with a dedicated database.
- Establish an appropriate level of documentation for remedial conservation treatments carried out by herbarium technicians.

References

www.synthesys.info/network-activities

www.spnhc.org

Care and conservation of botanical specimens.
www.icon.org.uk www.natsca.info

Return of the native (gold): The Wreck of the Royal Charter, Anglesey, Wales

A Welsh – Australian connection

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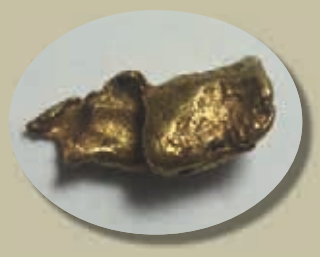


Introduction

Every museum specimen has a story, or more accurately, many stories to tell. Elements of these stories typically revolve around scientific importance, places, historical events, significant people, social history, or dark tales of acquisition. Complex webs of intertwining events and people may be connected through a single object. One such set of interconnected stories emerges from a small gold nugget (Fig. 1) within Museum Victoria's collections. The nugget links stories of: migration to the gold rush of the 1850s; a terrible maritime disaster; a visitor to earliest, pre-gold rush, Melbourne; and to the founding collections of Museum Victoria. By any measure the nugget has had an incredible journey since its formation some 400 million years ago. There is increasing interest from the general public, and historians, in the stories of acquisition and associated historical data preserved within natural sciences collections. Through modern social media there are also abundant opportunities to tell them.

The gold connection

Within Museum Victoria's collections is a small gold nugget, which weighs 4g and measures 1.7 cm long. The accompanying label tells its story (Fig. 1) and its connection with the tragic fate of the ship, the *Royal Charter*. The original owner of the nugget, William Ferris, was a shopkeeper in the rich goldfield of Ballarat (Fig. 3). It is highly likely the small surviving gold nugget was payment from a miner for goods received; as was common practice on the goldfields.

The donation of the gold specimen to the museum in Melbourne is recorded in *The Argus* Newspaper (October 23rd 1874) (Fig.10). The label may have accompanied the specimen on display in the Industrial and Technological Museum in the 1870s. The donation of the gold establishes the link between two Ulstermen, William Ferris and the intrepid traveler and collector, Gordon Thomson (Fig. 6). Both men have interesting tales.

The Welsh-Victorian connection

The *Royal Charter* shipwreck catastrophe

William Ferris was a third class passenger on the *Royal Charter* steamship (Fig. 3) travelling from Melbourne to Liverpool with its rich cargo of about 79,000 ounces of gold. Originally from Belfast, Ferris, a shopkeeper on the Ballarat Goldfields, like many of the passengers, was returning home after making his fortune during the 1850s gold rush in central Victoria. The ship, built in 1855, claimed to be capable of making the journey in 60 days between Liverpool and Melbourne.

On October 26th 1859, on the final leg of its voyage, the *Royal Charter* was struck by hurricane-force winds and foundered off the Welsh coast near Moelfra, Anglesey. It is one of the worst maritime disasters recorded, only 40 of the 490 passengers and crew survived[2]. William Ferris was among the fortunate few.

Ferris is placed at the wreck by an eyewitness account from Councillor Wagstaff of Bangor[2], who arrived at the scene early on the morning of Wednesday 26th after confirming rumours of a shipwreck with the Customs House, recalls the scene in detail: "*I spoke to a young man, William John Ferris, who said the vessel struck between 2 and 3 am, and they set the bay on fire with signals of distress, they set off blue lights, rockets, and fired cannons in the hope of getting assistance from shore. A man swam ashore with a hawser and by this means some had been saved.*"

An inquest to determine the cause of death was established followed by a Court of Inquiry to determine the cause of the wreck and whether negligence by captain or crew or inadequacies in the design of the ship contributed to the tragedy.

In the proceedings of the inquest, questions on the sobriety of Captain Taylor were raised although all witnesses called refuted the allegations. The jury verdict determined the people were *lost in the Royal Charter by pure accident: that the captain was perfectly sober, and that his conduct proves that he had done all in his power to save the ship and the lives of the passengers*[2].

By November 12th, Ferris was back in Belfast and apparently relayed his story to the Belfast Newsletter. During the Court of Inquiry, Ferris published a letter[3] (Fig. 5) stating that Captain Taylor was drunk and naming other passengers who would corroborate his story. No such additional evidence was forthcoming.

Salvage

At the time of the tragic shipwreck, some of the precious cargo of gold was recovered. Recently, renewed salvage operations[4] (Fig. 8) at the wreck of the *Royal Charter* prompted local media reports of the recovery of gold and treasures from the Victorian goldfields (e.g. *The Age*, July 18th, 2011). These reports triggered a small Museum project[5] that unearthed the 'Ferris' gold nugget link with the disastrous voyage (Fig.9).

Mr Gordon Thomson (1799-1886)

Born in Belfast into a wealthy family, Thomson (Fig. 6) spent much of his life travelling the world and amassing a collection of ethnographic objects from America, South America, Africa and the South Sea Islands, including Australia and New Zealand[6]. He donated about 340 specimens from his collection to the Belfast public museum.

Thomson visited Melbourne in 1836, when in its 'wattle-and-daub' infancy (Fig. 7) and barely a village[7,8]. He witnessed Melbourne founder John Batman 'purchasing' land, on which the city of Melbourne now stands, from the local Aborigines. He returned to live in Melbourne in 1872 and was amazed to see the *noble city of Melbourne*[7] that had developed following the boom of the gold rushes. Thomson's reminiscences of early Australia were published by *The Argus* in 1874 and shortly afterwards he donated the Ferris gold specimen, along with some significant Indigenous axe heads, to the Industrial and Technological Museum (Fig. 11), via the Public Library.

Gold rushes and migration

Since gold mining commenced in 1851, Victoria has produced more than 2,500 tonnes of gold. This represents about 3 percent of the world's total gold production to date. It was tales of fabulously rich alluvial deposits that attracted mass migration to the Colony in the early 1850s. In the first two years the State's population had grown from 77,000 to 540,000.

The occurrence of large gold nuggets throughout the alluvium provided the greatest fascination on the goldfields (Fig. 2). At least 51 nuggets weighing more than 500 ounces are recorded from Victoria, including the world's largest nugget, the Welcome Stranger (gross 2,520 oz), found in 1869. To promote the mineral wealth of the Colony, and to attract investment and people, models of large nuggets were exhibited at many of the 19th century Great Exhibitions around the world.

Museum Victoria's collection

Museum Victoria (1983) is now the sole institutional repository of geological specimens in the State. The origin of the collections can be traced to the period immediately following the gold rush of 1851. Geological collections were established by the Geological Survey (1853), The National Museum of Victoria (1854), the University of Melbourne (1856), and The Industrial and Technological Museum (1870) (Fig. 12), which later became the Science Museum of Victoria. All have been amalgamated into the collections of Museum Victoria[9].

Museum Victoria has a large and significant gold collection. Of the 2,330 gold specimens, about half are from Victorian localities, with coverage across the full extent of the State's gold-bearing regions. The collection has been the focus of a number of external research projects examining the formation of gold deposits in Victoria. The Museum houses a historical collection of gold nugget replicas created by the Mines Department from the late 1860s through to the early 1900s. Associated documents, including nugget registers, provide a guide to gold nugget discoveries in Victoria.

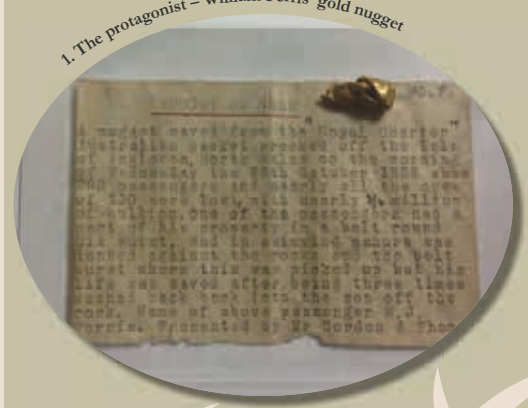
Many Australians can link their ancestors to the mass migrations to the gold rushes. In recent years the gold collection and associated archives have become a resource for genealogists. One nugget discovery, The Boort, has featured on the Australian television genealogy series *Who do you think you are?*

Conclusion

Historical Special Collections and the role they continue to play in a modern world highlights the ever changing role and uses of museum collections. Specimens that were collected over 100 years ago can be analyzed today using modern techniques in order to answer questions not imaginable at the time of acquisition. Interest in personal histories is also increasing. Museum specimens provide the linkages between historical events and the modern world.

MUSEUM VICTORIA MELBOURNE MUSEUM
SCIENCE WORKS IMMIGRATION MUSEUM
ROYAL EXHIBITION BUILDING

1. The protagonist – William Ferris' gold nugget



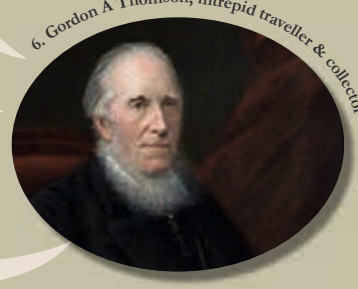
2. Nuggets from the Victorian Goldfields

3. Ballarat 1854, the time of shopkeeper William Ferris

4. The Royal Charter – wrecked October 1859

5. Ferris' letter to the Royal Charter inquest

6. Gordon A Thomson, intrepid traveller & collector

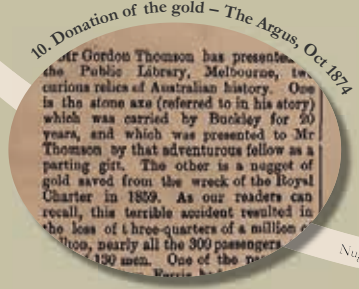


7. Melbourne Town, 1838

8. News from the salvage, The Telegraph

9. Museum Victoria Blog

10. Donation of the gold – The Argus, Oct 1874



11. Gold nugget display, Industrial & Technological Museum, Melbourne 1872

12. Museum Victoria, 2014

The gold nugget came from the Victorian goldfields

Ferris obtained the nugget on Victoria's goldfields

The Royal Charter brought people to the Victorian goldfields, attracted by the promise of spectacular wealth

Ferris brought the nugget home to Ireland on the Royal Charter's final voyage

The nugget was brought to England on the ill fated Royal Charter's final voyage

Geological collections were established during the early years of the goldrush

The nugget is currently stored in Museum Victoria's geological collections

Thompson, the collector, recognised the significance of the nugget and returned it to Victoria

Ferris gave the nugget to Thompson while he was in Ireland

Ferris testified against the ship's captain at the inquest

An inquest was held into the Royal Charter disaster

Salvage operations relating to the Royal Charter disaster gave rise to the web of connections and stories relating to the gold nugget in Museum Victoria's collections

Nugget donated to the Museum, 1874

Thomson was in early Melbourne, returning to be amazed by its transformation from the goldrush

Social media personalised the news of the Royal Charter's salvage effort

Social media was used to rapidly share the story

All early geological collections are now housed in Museum Victoria

References

1. http://www.old-merseytimes.co.uk/ROYALCHARTER.html
2. The Carnarvon and Denbigh Herald November 12 1859
3. Holden, Chris and Lesley, 2010: Life and Death on the *Royal Charter*. The true story of a treasure-ship wrecked on Anglesey. Cargo Publications. pp287
4. http://www.telegraph.co.uk/news/uknews/8642353/Gold-rush-shipwreck-offers-up-treasures-off-Welsh-coast-after-150-years.html
5. http://museumvictoria.com.au/about/mv-blog/sep-2011/royal-charter-gold/
6. Glover, Winifred: 1993: In the Wake of Captain Cook: The Travels of Gordon Augustus Thomson (1799 - 1886). Ulster Historical Foundation. 46 - 61
7. Early Australian Reminiscences of Gordon Augustus Thomson of Belfast, Ireland. The La Trobe Journal, 16, 96 – 101
8. Thomson's obituary, 'Death of one of Melbourne's Oldest Residents' – *The Argus*, 8 Jun 1886
9. Birch, W. D. and Henry, D. A., 2000: The geology collections of Museum Victoria. *Australian Journal of Mineralogy*, Vol. 6,2, 83–91

Figure acknowledgements

3. & 4. Courtesy State Library of Victoria

6. Courtesy National Museums Northern Ireland

All others Museum Victoria

The Oskar Vogt bumblebee collection

a rich and now easily accessible resource

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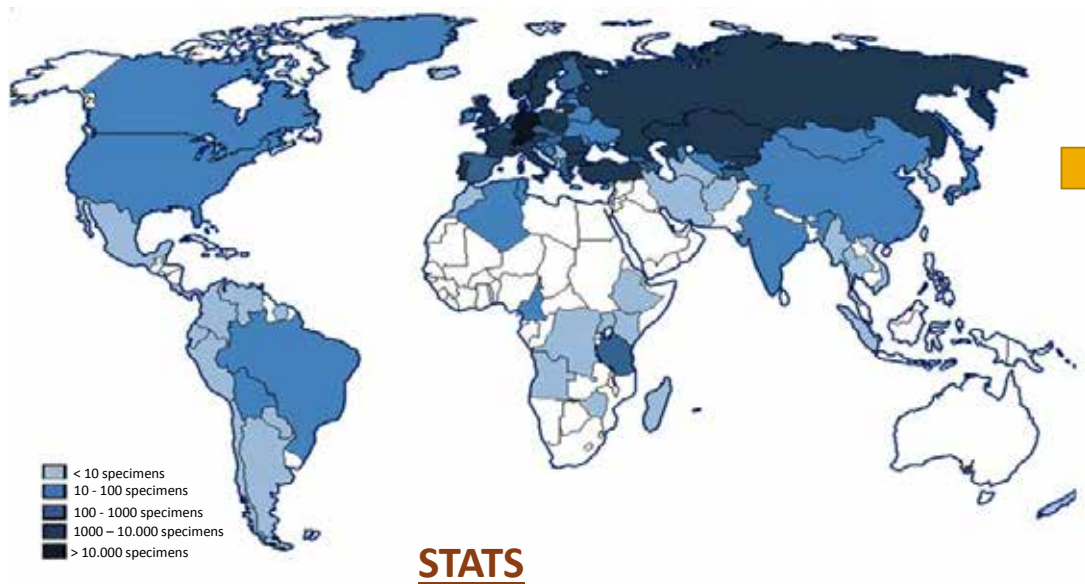
OSKAR VOGT

Source: Berlin-Brandenburgische Akademie der Wissenschaften

Prof. Dr. Oskar Vogt (1870-1959)[1] has built a large collection of bumblebees, because of his fascination with their natural variation. His occupation as a brain researcher kept him from working on his collection as he wished. Vogts' most extensive publication is his monograph on bumblebee variation[2], in which natural variation leads him to the development of his own variant to the evolution theory. He later tried to parallel natural variation in bumblebee exterior to variation in human brain structures.

COLLECTION USE

After Vogts' death in 1959, Dr. G. Kruseman secured Vogts' collection for the Zoological Museum of Amsterdam. Kruseman intended to write a monograph on the bumblebees of the world, but sadly never finished his work. No extensive work has been done on Vogts' collection since.



STATS

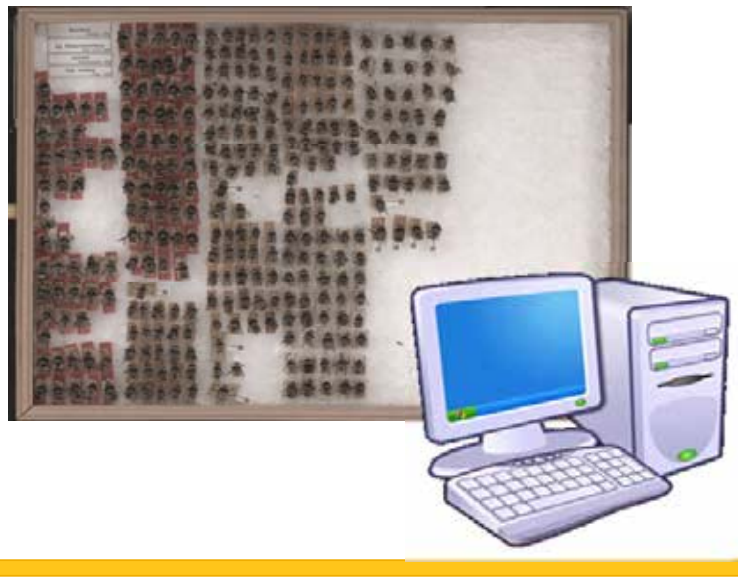
- ~ 300.000 bumblebees
- collected between 1887 and 1959
- from all over the world
- massive amount of type material
- astounding abundance of specimens from southern Russia
- includes large series of specimens from the same localities
- collected or purchased by Oskar Vogt

Source: Pollinator Stewardship Council

ACCESSIBILITY

Vogts' collection is currently housed in the Naturalis Biodiversity Center, Leiden, Netherlands, where it forms the majority of the bumblebee collection.

Fundings from FES* made it possible to have Vogts' entire collection digitized. All data have been published on GBIF.



* Fonds Economische Structuurversterking (Economic Structure Enhancement Fund)

REFERENCES

[1] For more information see: Boer AJ de 2002. The types of Carabidae (Coleoptera) in the Zoölogisch Museum Amsterdam, predominantly the collection 'Oskar Vogt'. Biodiversity Information Series from the Zoölogisch Museum Amsterdam 2: 1-147.

[2] Vogt, O. (1909/1911). Studien über das Artproblem: Über das variieren der Hummeln. Volume 1/2. Sitzungsberichte der Gesellschaft naturforschender Freunde zu Berlin 1909: 28–84 / 1911: 31– 74.

Rescuing data at risk of getting lost
- the reBiND project –

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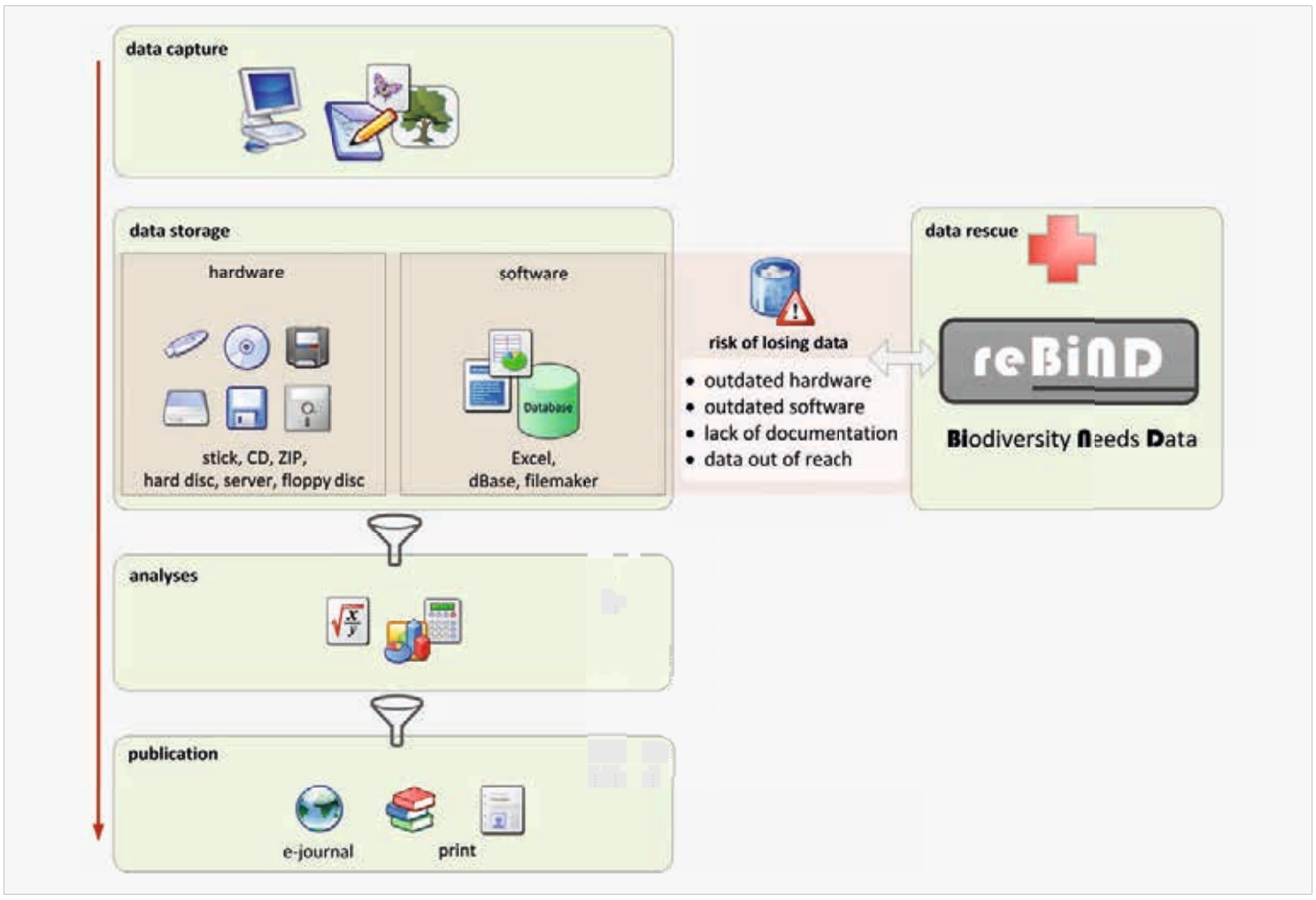

Fig. 1. data at risk within the current publication process

Biodiversity data loss

In studies and projects large volumes of biodiversity data are collected and stored. Only a small part of it is used in publications and thereby available for the scientific community.
The rest of the data usually stays in poorly documented, unpublished files or databases. As time passes accessing the data gets increasingly difficult because software versions change and outdated storage media are not supported anymore. At the same time access to primary research data is urgently needed to address the pressing scientific questions in a rapidly changing environment. The huge amount of neglected biodiversity data should be made accessible and shared, so it can be used in future analysis.

New workflow for data rescue

The reBiND project develops a workflow to rescue legacy databases from biodiversity science to provide permanent storage and support sharing of research data.

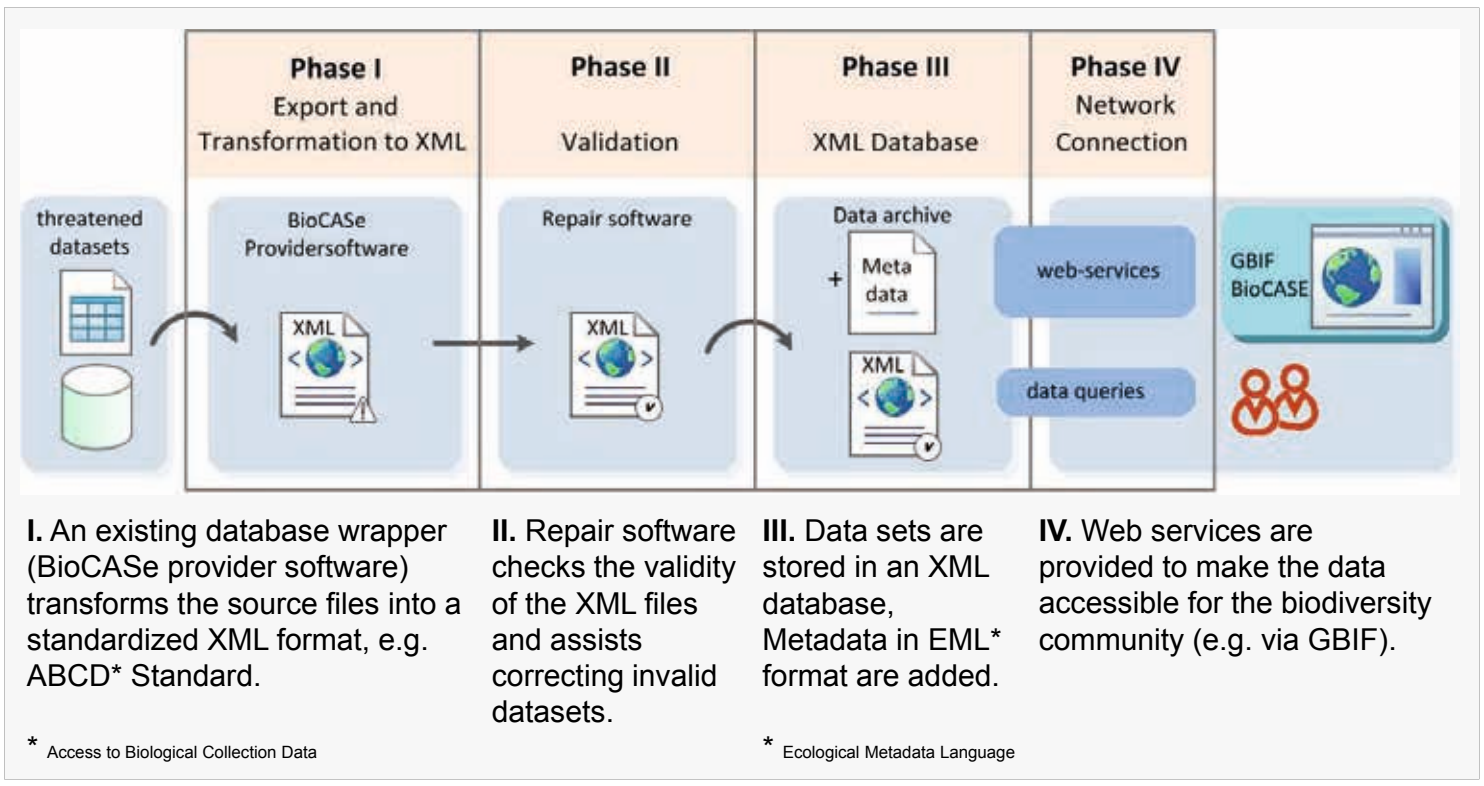

Fig. 2. workflow to transform datasets from individual data providers into a reBiND data archive

The reBiND movie

See the idea of the reBiND project illustrated in a stop motion movie.

http://rebind.bgbm.org/rebind_movie

scan the QR code below:

Contact
email: rebind@bgbm.org
website: http://rebind.bgbm.org

Reference
Anton Güntsch, David Fichtmüller, Agnes Kirchhoff & Walter G. Berendsohn (2012): Efficient rescue of threatened biodiversity data using reBiND-workflows, Plant Biosystems, Vol. 146, No. 4, pp. 752-755. DOI:10.1080/11263504.2012.740086

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funded by DFG

SAFETY RISK MANAGEMENT OF RESIDUAL PESTICIDES IN COLLECTIONS

Kerith Koss Schrager, Anne Kingery-Schwartz and Kathryn Makos (Health & Safety Committee of the American Institute for Conservation)

Individuals should consider their own health and safety to be equally as important as the health and safety of the collections in their care, particularly when handling potentially hazardous materials such as those containing pesticide residues. Creating a comprehensive plan to assess and manage risks provides management with a prioritized plan for budgeting resources toward not only protecting staff but making collections accessible for use. Safety investments are not just a legal requirement of the collecting institution to provide a safe environment, but also a positive factor in productivity.

ARE YOU AT RISK?

HAZARD vs. RISK – An Important Distinction! Pesticides are inherently hazardous by nature. Risk is the degree to which that hazard will negatively affect your body's systems.

Disciplined reliance on OSHA recommended safe work practices, engineering controls, and proper training will help reduce your health risks.

For example, formaldehyde (a carcinogen) poses low-exposure risk if handled with proper gloves and used in a hood by a person with safe work practice training.

WHAT IS A RISK MANAGEMENT PLAN?

A Risk Management Plan serves to protect persons from the risks associated with workplace tasks such as handling collections-based hazards inherent to or acquired by objects and specimens. Once the commitment is made to create proactive safety programs, the technologies of hazard control are well-developed, often inexpensive, and easily accessible.

HEALTH & SAFETY RESOURCES

Numerous public health and safety resources exist to help individuals as well as large facilities assess hazards, then develop and implement a risk management plan. These include easily accessible web-based information, such as directories of professional organizations' safety consultants, information on pro-bono services, and links to occupational medical clinics.

For links to resources on specific topics, visit the

AIC Health & Safety Committee website

www.conservation-us.org/HealthandSafety

KEY ELEMENTS OF A SAFETY RISK MANAGEMENT PLAN

The following procedures will help create a risk management plan for the safe handling of pesticide-contaminated objects. Contamination includes all current pesticide treatments, legacy hazards from historic treatments and toxic elements inherent to the collection.

HAZARD IDENTIFICATION by Collection Type

Determining whether pesticide residues are present on objects can be difficult since the residues are often not visible to the naked eye.

- Chemical or analytical tests are required to confirm the presence of pesticides
- Learn to recognize the types of collections that are commonly treated and the types of pesticides that are used on those collections
- Keep in mind that organic ethnographic, taxidermied and botanical collections were regularly treated with pesticides such as arsenic, mercury and DDT

EXPOSURE ASSESSMENT

If pesticides have been identified, conduct an assessment to define the severity of the contamination and the risks associated with handling, storing or displaying contaminated objects.

- Determine if the contamination can be contained or eliminated
- Consult an Industrial Hygienist or Safety Professional
- Identify exposure risks through personal monitoring while performing work tasks
- Use exposure study results to decide feasible ways to remediate or control exposures

REMEDIATION & DECONTAMINATION

In many cases, objects cannot be completely decontaminated and should be isolated to prevent contamination of cabinets, workspaces and exhibitions cases.

- Clean objects using a HEPA-vacuum for dust suppression or wash to remove contaminants
- Use a fume hood or trunk whenever possible
- Consult federal, state and local regulations for proper disposal of each type of pesticide on objects and materials—they may be EPA regulated hazardous waste
- Process specimens quickly to remove treatment hazards and cover during transport

SAFETY PROTOCOLS & TRAINING

Anyone who will be in contact with contaminated objects or areas must receive periodic training for handling, treatment and cleaning.

- Always wear and have in stock the appropriate Personal Protective Equipment (PPE) such as gloves, respirators, lab coats, Tyvek suits and goggles that are approved for the identified contaminant
- Create a written plan describing safety protocols once a contaminated object has been identified

HAZARD DISCLOSURE

Learning to effectively communicate about hazards is an important step in safety in the workplace.

- Post warning signs for staff and visitors, alerting them to the hazard and required access procedures
- Learn legal and ethical practices for the disclosure of pesticide-contaminated items that are going to be shipped, loaned or repatriated
- Get hazard identification from all lenders of collections, including your own staff

Photo credits: K. Makos, C. Hawks, Smithsonian Institution