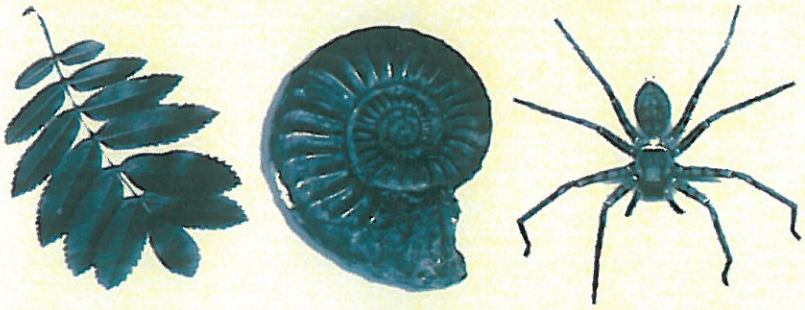
# NatSCA News



NatSCA

Natural Sciences Collections Association

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Issue 20
January 2010

charity number 1098156
registered in England and Wales

## The Society

The Natural Sciences Collections Association promotes: research and exchange of ideas, advances in technical and ethical standards and raising the public profile of the conservation and preservation of natural science collections and objects.

**www.natsca.info**

## Membership

NatSCA is keen to open its membership to all those involved in the care and conservation of natural science objects and encourages their active participation.

## Annual Subscription

| | |
|---|---|
| UK personal | £15.00 |
| Overseas personal | £15.00 |
| Institutional | £30.00 |
| Unwaged | £10.00 |

*We are sorry but we are unable to accept Visa, and payment must be made in Sterling*

## Newsletter

The Newsletter is a forum for articles, views and opinions on the care, conservation and curation of natural history and associated material. The Newsletter is produced three times per annum and is free to all members.

| | Commercial Rate | | Museums & Member Organisations | |
|---|---|---|---|---|
| Adverts: | 1/4 page | £ 40 | 1/4 page | £ 25 |
| | 1/2 page | £ 60 | 1/2 page | £ 35 |
| | Full page | £ 100 | Full page | £ 50 |
| Inserts: | £ 100 + postage | | £ 50 + postage | |

## Advertisements
## Instructions for Authors

Material should be submitted electronically either on disc or by email to the editor. All text should be in Times New Roman, font size 10. Please supply all images separately, not embedded in your document, as tiffs at 300 dpi. Images should be labelled Fig. 1., Fig 2., etc… All figure captions should be in full and in the main body of the text where the author wants the images to go. The names of animal and plant species should be in Italics and the authority name given in full for the first time used, thereafter they may be omitted. All references should be given in full. Footnotes will not be accepted. Instead, please use Endnotes.Articles and other items for inclusion should be submitted to the Editor at least three weeks before the publication date. Images which need to be printed in colour should be discussed with the editor upon submission. There is always the option of an author paying for colour, if you would prefer it but it is not essential to the sense of the paper. We will always print in colour when it is necessary.

Opinions expressed in the Newsletter are not necessarily those shared by the NatSCA Committee, the Editor or the membership at large.

# *Index*

# *New Life and Old Collections*

As I write, my wife and new born son have just returned home from hospital and are both healthy and well. Little Laurie was born at 5.53pm on 2nd January 2011, weighing 7 pounds and 7 ounces. From microscopic beginnings, a plethora of genes switching on and off at all the right stages, a myriad of chemicals and enzymes, and uncountable cell divisions all produced this tiny baby. Of course, this is the same in the whole animal world, from whales to ants. We, in the museum world, are incredibly lucky to look after such amazing collections of animals and plants; each collection varying from place to place depending on the early local collectors. Our old collections hold such fascinating and important early insights into natural history as it was just being discovered by those pioneering early collectors and it is these stories that continue to fascinate colleagues and people today.

This issue has a range of interesting and useful articles from museums across the country. Articles range from this history of the Natural History Museum, London, to new research and storage of an old Coleoptera Collection at the Potteries Museum. There are numerous projects we are working on; researching old collections, conservation projects, educational projects, creating exhibitions and much more. By sharing these projects in *NatSCA News* inspires colleagues who may be thinking on similar lines. Please continue to send in articles FOR *NatSCA News*.

For the first time the whole NatSCA committee have written a short paragraph about themselves and what their role on the NatSCA committee. If anyone is interested in any of the NatSCA committee roles then please feel free in contacting one of us.

Jan Freedman
3rd January 2011

## *Contributions for Issue 21*

All articles, letters, news, adverts and other items for inclusion for the next issue of the NatSCA Newsletter should be sent to the address below by April 1st 2011:

Jan Freedman [Editor, NatSCA]

Plymouth City Museum and Art Gallery,
Drakes Circus, Plymouth, PL4 8AJ

Email: jan.freedman@plymouth.gov.uk

# *View From The Chair*

Seasonal Greetings form a snowy Natural History Museum. I have set down my experiences over the past few years of great change here at my Museum in this issue of NatSCA News. What have been your experiences of recent changes in the sector? Do you have a story to tell? Why not write about them and publish in NatSCA News.

The annual conference for 2011 will be held at The Great North Museum in Newcastle over two days on Thursday 3rd and Friday 4th March. On Thursday, we are planning to study the very relevant subject of coping with cuts, looking at case studies and advice and suggestions in relation to managing budget cuts. This session will provide practical advice and ideas for coping with cuts to staff and funding for natural science collections, from how to apply for grants effectively to innovative money-saving ideas. On the Friday, we will have practical sessions on coping with collections deterioration including how to deal with Bynes disease, fluid preservation problems, mould, verdigris and pyrite decay. We will hold our AGM on the Thursday and we are looking for some dynamic new committee members for 2011. We do not require any previous experience but we do wish candidates to have an enthusiasm for natural science collections. If you would like to stand on the NatSCA committee please email clare.brown@leeds.gov.uk for more details. We hope to see you all in Newcastle!

Please send your booking forms to Tony Irwin at the Natural History Section, Norfolk Museums and Archaeology Service, The Shirehall, Market Avenue, Norwich, Norfolk NR1 3JQ; Direct line: 01603 493642, Fax: 01603 493623 & E-mail: tony.irwin@norfolk.gov.uk. Deadline for bookings is 11th February 2011. Please send your conference enquiries to our committee member in Newcastle, Nicola Newton at nicolajnewton@hotmail.com or to our NatSCA Secretary, Clare Brown at Leeds Museum Discovery Centre, Carlisle Road, Leeds, LS10 1LB, 0113 2141563, clare.brown@leeds.gov.uk.

Paul A Brown, 20.xii.2010

# 3rd & 4th March 2011
# The Great North Museum, Newcastle
# Conference and AGM 2011

## Coping with Cuts & AGM (3rd March)
## Coping with Collections Deterioration (4th March)

The next NatSCA conference and AGM will be in Newcastle in March 2011. The conference will be split into two topics: "Coping with cuts" on the Thursday and "Coping with collections deterioration" on the Friday.

### Coping with cuts
### Thursday 3rd March

A day looking at case studies, advice and suggestions in relation to managing budget cuts. This session will provide practical advice and ideas for coping with cuts to staff and funding for natural science collections. From how to apply for grants effectively to innovative money-saving ideas.

### Coping with collections deterioration
### Friday 4th March

Practical and hands-on sessions covering natural science conservation techniques. Topics proposed include how to deal with Bynes disease, fluid preservation problems, mould, verdigris and pyrite decay.

### AGM
### Thursday 3rd March

We are looking for some dynamic new committee members in 2011. No experience necessary – just an enthusiasm for natural science collections. If you would like to stand on the NatSCA committee please email clare.brown@leeds.gov.uk for more details.

### Call for speakers

If you would like to give a talk at the 2011 conference on either of the above days, please contact Nicola Newton (nicolajnewton@hotmail.com).

## NEWCASTLE 2011 CONFERENCE & AGM BOOKING FORM - Part 1

Please complete this booking form and send to Tony Irwin at Norwich - address below.

Please keep a copy of your form for reference. Deadline for bookings is 11th February 2011.

**Name**.....

**Organisation**.....

**Address**.....

.....

**E-mail**:..... **Tel**:..... .....

**CONFERENCE COSTS**
**(Please tick as appropriate. All lunches & refreshments included.)**

| | 2 day rate | Day rate |
|---|---|---|
| Early-bird member (by December 31st): | □ £70 | □ £45 |
| Early-bird non-member (by December 31st): | □ £90 | □ £55 |
| Member: | □ £75 | □ £45 |
| Non-Member: | □ £95 | □ £55 |

Institutional members please note that this category of membership entitles you to two member rate places at conference.

Please note any special dietary requirements: .....

.....

Please note that the dinner is an additional charge

I will be attending the Conference dinner - cost £15 per person □

**Payment total = £.....**

Any queries: **Nicola Newton**, (nicolajnewton@hotmail.com) or **Clare Brown**, Leeds Museum Discovery Centre, Carlisle Road, Leeds, LS10 1LB, 0113 2141563, clare.brown@leeds.gov.uk

## NEWCASTLE 2011 CONFERENCE & AGM BOOKING FORM - Part 2

### PAYMENT

Name.....

Payment total £.....

I enclose a personal cheque for £.....

This is for the conference fee only / meal only

Please send me a receipt for this amount □

Cheques should be made payable to the **'Natural Sciences Collections Association'**

My institution will pay by cheque □

Send me an invoice for £.....

My institution will pay my fee into the NatSCA bank account by BACS transfer. □

Send me an invoice for £.....

Order number (if required on invoice) .....

**Send booking forms and payments to :**

Dr A.G.Irwin,
Natural History Section
Norfolk Museums and Archaeology Service
The Shirehall,
Market Avenue,
Norwich,
Norfolk NR1 3JQ
Direct line: 01603 493642
Fax: 01603 493623
E-mail:tony.irwin@norfolk.gov.uk

# Meet the Committee!

Some of you may have heard about the NatSCA committee, but what do we do? How can you get involved?

We do a lot behind the scenes, including, organising training and seminars, and the yearly conferences, advising colleagues about legislation relating to collections, supporting collections at risk, and proving great opportunities to meet other colleagues.

The NatSCA AGM provides the opportunity for NatSCA members to join the committee. A nominations form is sent out before the AGM, and please feel free to be nominated for any of the committee roles.

Below is a small bit of information about the different roles on the committee, so you know what we do! Please feel free to contact any of us if you were interested in any of the committee posts.

## **Chair:** Paul Brown

Senior Curator, Entomology, Natural History Museum, London

I am the Senior Curator, Entomology Department, at the Natural History Museum which involves curation, conservation and documentation of several insect groups, slide and spirit collections and associated databases. I have been working at the NHM since 1977, and I am particularly interested in the preparation, conservation and management of microscope slide collections. As NatSCA chair, I ensure that our organisation runs smoothly and monitor the state of the Museum Industry specifically concerning the interests of our membership. I write letters of concern about collections and museum staff 'at risk' and represent NatSCA Subject Specialist Network at meetings around the country.

## **Secretary:** Clare Brown

Curator, Natural Science, Leeds City Museum & Art Gallery

A biology curator for nearly ten years now (time flies!), I followed a straight root through a biology bachelors, a museum studies masters and plenty of volunteer work to posts at the NHM, Portsmouth Museums and finally Leeds.
I look after Leeds's ~800,000 natural science specimens - from lichens to lemurs - with responsibility for nh collections care, education, displays and loans.
For NatSCA, I arrange our committee meetings (and take the minutes) as well as involving myself in any NatSCA projects that sound interesting or worthwhile. I've really enjoyed getting to the bottom of some of the legislation affecting our collections - although there's a long way to go - and I like organising some of the training workshops: particularly if the topic is something I've always wanted to know more about.

## **Treasurer:** Tony Irwin

Senior Curator of Natural History, Norfolk Museums and Archaeology Service

I am responsible for the day to day care and use of the Natural History Collections, including documentation, conservation, acquisition, disposal, display, interpretation, enquiries and access. The role is both strategic and hands-on. The hands-on bit is what keeps me going. Like many NH curators, I couldn't cope if everything was admin. I share the work with the Geology Curator, Dave Waterhouse - and a team of volunteers.

My role in NatSCA is that of Treasurer - looking after the Association's finances and making sure that bookings for workshops and conferences go smoothly! It's an interesting job - not least of all because we come from different backgrounds where budgets vary ten thousand-fold. Balancing evereyone's expectations and spending styles is much more difficult than balancing the books!

## **Membership Secretary:** Maggie Reilly

Curator of Zoology, Huntarian Museum, Glasgow

I run the Zoology Section of the Hunterian which is a University Museum with collections in art, medicine, technology, coins, natural sciences, archaeology, ethnography and history. My job involves me in all aspects of running a museum – collections management, curation, conservation, collections research, exhibitions, live animal displays, University and other teaching, public understanding of science programmes, general management and admin, and fundraising.... I am the membership secretary for NatSCA, a post I have held for several years. I maintain the email distribution list and occasionally send out news, job ads, enquiries etc that might not get round everyone on JISCMAIL. The general things I enjoy about NatSCA are knowing there are likeminded people out there with whom you can meet up, exchange information and news, learn useful stuff, solve problems, commiserate when things aren't going well and celebrate when they do! As membership secretary, I like doing an essential 'behind the scenes' job to keep the Association running.

## **Editor:** Jan Freedman

Acting Keeper of Natural History, Plymouth City Museum and Art Gallery

I have been working in museums since 2002, and began as an Assistant Keeper of Natural History in 2006. My job currently involves working on the collections, exhibitions, working with primary and secondary schools, supporting university lectures, and lots more!

I am currently the Editor for *NatSCA News*, which involves contacting colleagues about articles, editing the articles and getting *NatSCA News* together using Microsoft Publisher. Being on the committee is a great way to keep in touch with what is happening in the museum sector, and a fun way to meet new colleagues and get new ideas together!

## **Assistant Editor:** David Notton

Senior Curator, Hymenoptera, Natural History Museum

I assist the Editor, submitting authors and external guest reviewers in reviewing selected articles for publication in NatSCA News. This is to ensure that they are as well presented, accessible and accurate as we can make them, maintain the quality and status of NatSCA news and to attract high quality copy. NatSCA is a great publication because it can combine popular newsy articles and practical technical papers of lasting value. It's a fun job because I can keep up to date on a wide range of topics!

## **Conservation and ICON Rep:** Simon Moore

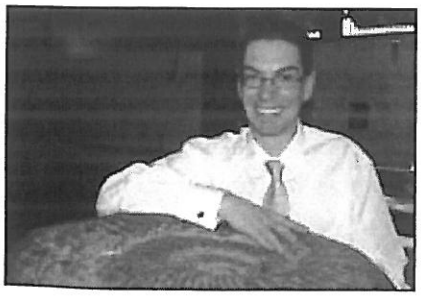
I have worked in the conservation of biological specimens since 'A' levels (1966/7) and has specialised in fluid preservation and regularly runs courses in this discipline and other natural science-related disciplines. I worked at the Natural History Museum between 1968 and 1991 and Hampshire County Council Museums Service from 1991 to 2009 and has since worked freelance.

I was a founder member of the UKIC natural sciences conservation group in 1993 and of the independent natural sciences conservation group 2 years after and was chair of the NatSCA formation steering committee.

Throughout, I have been involved into the improvement of natural science specimen conservation technology and tried to become involved further in as much of this area as possible with similar bodies throughout Europe, Australia, New Zealand, USA and Canada.

My work on the committee has always been to ensure that conservation issues and knowledge have their fair share and to represent conservation viewpoints and promote as much hands-on knowledge advancement as possible.

## **Geological Curators Group Contact:** Leslie Noe

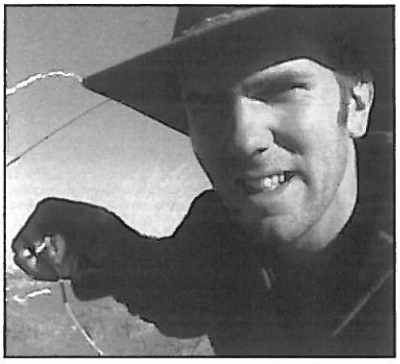


I am the NatSCA representative for the Geological Curators' Group (GCG), which involves attending both sets of committee meetings and ensuring communication and liaison between the two curatorial groups. The role is an essential one, ensuring close ties between the two groups, and nicely complements my broad interests in Natural History. I am currently curating the Harland collection in the University of Cambridge. This internationally important collection, consists of at least 60,000 rocks, fossils and minerals collected from the arctic archipelago of Svalbard over more than 100 years. The work is in preparation for formal handover to the Sedgwick, the Earth Science museum within the University.

## Committee Members:

### Jack Ashby

Learning and Access Manager, Grant Museum of Zoology



I run the Learning and Access programmes at the Grant Museum of Zoology, UCL. My main interest is public engagement in the natural sciences through any format that might get people in contact with our collections and discipline. In the past I have worked at a science centre and headed up learning activities across archaeology, art and geology collections. Working at a university museum, a large part of my work involves enhancing Higher Education teaching and research in the museum, and linking the UCL community with our informal learning programmes.
At NatSCA I tend to get more involved in the public engagement side of things, but my museum interests are broad. One of the best things about being on committee is influencing national agendas and even changing the law. With a passion and background in zoology it's great to work closely with similarly driven people.

### Kate Andrew

Principal Heritage Officer of Herefordshire Heritage Service

I run the county museum service across five sites and a mobile museum. As the only geologist on the staff, I retain curatorial responsibility for a small but historically interesting geology collection.
I was a founder member of the group and for many years its Treasurer, but has been an ordinary committee member for the last few years. I am currently leading a Heritage Lottery Fund supported Skills for the Future project that will see 5 biology curators trained over the next two years in Leeds, Manchester and Hereford. NatSCA is supporting the project financially and several members are involved in the project group. Its good to see ideas and concerns raised by NatSCA turning into action.

### Paolo Viscardi

Deputy Keeper, Natural History, Horniman Museum

I'm Deputy Keeper of Natural History at the Horniman Museum, where I take responsibility for the curation and interpretation of the Osteology and Palaeontology collections. As an extension of my job I am involved in communicating about natural sciences through my blog Zygoma and through AskABiologist.org.uk. I am also a member of the NatSCA committee, which provides a valuable opportunity to support the wider natural science community. Working with NatSCA also enables me to engage with peers to gain and share knowledge and experience about the sector.

## Clare Valentine

Head of Zoology, Natural History Museum, London

I am Head of Zoology Collections at the Natural History Museum, London, where I am responsible for planning and overseeing the care, maintenance, enhancement, administration and provision of access to the estimated 28 million zoology specimens, and the work collections management staff. My role is to act as liaison between NatSCA and SPNHC, the US-based Society for the Preservation of Natural History Collections for which I am a Member at Large on the Council to add a European focus.

## Clare Mellish

Curator, Fossil Arthropods, Natural History Museum, London

I am the Curator of fossil arthropods and graptolites, at the Natural History Museum, London. I have worked in the conservation department, and subsequently a research assistant investigating trilobites. My main interest is working with trilobites, but I also carry out research into fossil crab collections, and look after the amber collections.

## Miranda Lowe

Acting Collections Manager, Lower Invertebrates, Natural History Museum

I am Senior Curator (and Acting Collections Manager) in the Zoology Department at The Natural History Museum, London and have served in the department since the early 1990's. I specifically manage the Crustacea collections as well a team of curators responsible for the Lower Invertebrate collections. '*Discovery*' and '*Challenger*' collections, Darwin's barnacles and the Blaschka marine invertebrate glass models, are amongst some of the historical collections under my care. I am also a member of a number of societies including The Barbados Museum and Historical Society and currently serve on the committees of NatSCA and The Society for the History of Natural History. I am a Science & Engineering Ambassador for the organisation STEMNET.

In the past I organised the NatSCA Adhesives seminar held at the NHM London. Being a committee member of NatSCA has allowed me to actively get involved in issues about Museum collections and their future, which is an important part of my professional career development.

# Taxidermy and the Law Seminar, 8 February 2010
# New Walk Museum, Leicester

Angela Smith

Documentation Officer, Gloucester City Museum & Art Gallery
Brunswick Road, Gloucester, GL1 1HP

Email: Angela.Smith@gloucester.gov.uk

It was on a crisp winter's morning that I found myself walking through Leicester to the New Walk Museum for the Taxidermy and the Law seminar. There are several laws that cover the possession and use of protected wildlife and plant specimens, and I've always found them quite confusing. I was therefore keen to attend this seminar and get a better understanding of the law and how it relates to us as museum professionals. The meeting was very well attended with 31 people from museums across the UK.

## Chris Auger: Licensing Quality Manager for Animal Health

### CITES made simple

CITES - the Convention on International Trade in Endangered Species (of Wild Fauna and Flora) - is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. The first speaker was Chris Auger, Licensing Quality Manager for the UK CITES Management Authority (Animal Health, an executive agency of Defra, the Department for Environment, Food and Rural Affairs). She gave a very informative talk and make what is quite a complex issue much clearer, although there are some grey areas, particularly where museums are concerned. Chris produced a handout of the slides used for her presentation, but rather than reproduce these here, I will just cover the main points. More information can be found on the Animal Health website and Chris stressed that we are welcome to contact her office to discuss concerns.

Under EC Regulations there is an obligation on the UK for national enforcement of CITES. This is done through the Control of Trade in Endangered Species Regulations (1997) and amendments, also known as COTES. Chris explained under what circumstances we would need EC certificates, also sometimes referred to as licences, specifically Articles 10 and 60. Part of Chris's job is to advise customers whom think they may need a certificate or are unsure about the law.

### Why do we have CITES?

Many species worldwide are becoming extinct and extinction rates are on the rise. While we cannot control many of the forces that are causing extinctions, one thing that can be controlled is trade. It is important not to ban wildlife trade completely as some communities in developing countries rely on it for their livelihoods.

For the purposes of CITES museums only need to be concerned with Annex A species (the most critically endangered). A list of these species can be found on the Animal Health website. The basic rule is that all commercial use of these specimens or their parts is prohibited unless covered by an EC certificate.

The questions we have to ask ourselves are:
1. Does the museum hold any Annex A specimens or parts e.g. carved ivory/bone/teeth, feathers, skin or wood?
2. Are they used commercially?
3. Are they covered by antiques derogation (see below)?
4. Do you have a certificate already (Article 10 or 60, or old Article 30 (now replaced by 60)? Some have an expiry date, but it is worth checking with Animal Health to see if you are already covered.

***The definition of commercial use is quite complicated, but in brief, commercial use does not have to make a profit and can include:***

- When on public display with an admission charge
- When on public display and free entry is accompanied by requests for donation where there is an element of coercion, for example where a donation box is placed in a prominent position and is accompanied by a sign suggesting an amount that should be donated, or where stewards approach incoming visitors and ask for a donation.
- In exchange for goods that have a value
- Any use that has a financial benefit
- On loan for a fee
- For sale and purchase, or keeping for future sale, e.g., in the freezer
- Offering for sale or transporting for sale
- In exhibitions and events that are charged for and that feature the Annex A specimen

Or when part of a paid tour of museum stores, and where the specimen is the main focus (if it is not the main focus, this is not deemed commercial use)

Commercial use does not apply if charges in the museum do not directly involve the Annex A specimen, e.g. if the museum has a shop, or if an event or exhibition is held where an entry charge is incurred, and this is in a separate part of the museum to where the specimen is kept. At present, the sale of images of the specimen is not commercial use unless the images are to be used commercially. Some situations can be open to interpretation and hence, you may need advice from Animal Health for these.

CITES is all about trade so the two important issues are: what are you gaining by having it, and is it a 'finished article' or is it unworked and therefore could be made into something worth trading. The question of what is worked or unworked includes several grey areas and again you may need advice on these.

**Antiques derogation**

Definition: - When a worked specimen was acquired before 1 June 1947 and has not been altered or restored since that date (cleaning or maintenance do not come under this definition). If it was acquired more recently than this, but is thought to be older than this date you need to prove that it has not been altered between 1947 and the acquisition date. You will need documentary evidence e.g. letter with date, receipt, photo (that can be dated), or transfer of title form. You do not need a certificate before doing restoration work unless you will subsequently be using it commercially.

**Worked specimens**

Again the definition is not too clear and even Chris and Kim disagreed on some of the finer points, but essentially an unworked specimen is one that can be made into something with commercial value. This will be discussed at the next EU Management Committee meeting and Chris will subsequently write guidance notes. Animal Health can advise on individual cases, but you should get independent legal advice if you are unsure.

Examples given of worked specimens include: antique furniture, rhino horn libation cup, ivory statuette, articulated tiger skeleton, tiger skin rug, mounted hunting trophy or a wall plaque, broom made from elephant hair or polished turtle shell.

Examples of unworked specimens include: uncarved elephant tusk, polished tusk, tiger bones in a box (drilled but not articulated), a trophy removed from wall plaque (or has fallen off) or a shell removed from a turtle.

**A brief summary of EC certificates**

Article 60 certificates:

- Are issued in name of the institution
- Covers commercial use (except sale) of all Annex A specimens held by that institution, which are being used to promote conservation (research or education)
- Cost £177
- Cover only scientific institutions (e.g. museums, zoos etc.)

- Replace Article 30 certificates
- Need evidence of origin of all specimens to be covered (or if museum has not catalogued all the specimens, they will accept full evidence of a sample of at least five specimens)

Can cover more than one museum on one certificate if the collection is owned by a joint service

Article 10 certificates:

- Are issued in the name of the trader
- Only covers one specimen per certificate
- May cover all commercial uses, including sale
- Cost £25

**Other points to note:**

**Individuals can be liable, not just organisations – bear in mind that it could be you!**

If a specimen cannot be identified, treat it as though it is not Annex A. You need to show that you have tried to find out what it is. If you have reasonable doubt that it may be Annex A, you must find out, as ignorance is no defence in law.

Imports and exports are covered by other permits. Crown Dependencies, such as the Isle of Man, and British Overseas Territories are not included in the EU but the Canary Islands are. For temporary display abroad there are two certificates: the Travelling Exhibition Certificate and the Sample Collections Certificate.

Non-commercial loans between registered scientific institutions can use labels provided by the UK Management Authority (Animal Health), the top part must be attached to the outside of the container and must have a five digit number. The bottom part must be returned to Animal Health and an annual report sent to them by 31 December each year.

Apart from a few grey areas, most of the CITES information is fairly clear and Chris's team are on hand to answer any questions. One point to remember is that if you think you need a certificate; contact Chris's office first before applying, because the fee is non-refundable if a certificate is not needed. Details are at the end of this article.

After a very good lunch we returned to the meeting room to hear what Kim MacDonald had to tell us about the remaining wildlife laws.

**Kim MacDonald: The Taxidermy Law Company**

The Taxidermy Law Company, run by Kim, specialises in advising auction houses, dealers, taxidermists and museums about wildlife laws governing natural history collections. Although Kim has not studied law, he has an impressive background that you can read about on the website (www.taxidermylaw.co.uk) and is very knowledgeable about his subject. Taxidermy law is not a straight-forward issue and Kim did an excellent job of answering all our questions. To summarise his talk:

The laws that specifically relate to natural history collections are:

- Game Act 1831
- Protection of Birds Act 1954
- Wildlife and Countryside Act 1981
- The Wildlife (Northern Ireland) Order 1985, and amendment 1995
- Deer Act 1991
- Protection of Badgers Act 1992
- The Conservation (Natural Habitats, &c.) Regulations 1994
- CITES – EC regulations 338/97 and 407/2009
- Control of Trade in Endangered Species (Enforcement) Regulations 1997, and amendments 2005, 2007 and 2009
- Countryside and Rights of Way Act 2000

- Nature Conservation (Scotland) Act 2004
- The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2004, and amendments 2007 and 2008

Kim explained the finer points of some of these Acts and Regulations, but rather than risk giving information that may be misleading, anyone needing further information should contact Chris Auger, Kim MacDonald or one of the wildlife licensing authorities listed below.

**Antiques Derogation**

Kim went through the antiques derogation section of the regulations in great detail giving examples of worked and unworked material. The main issue seems to be the definition of maintenance, and the distinction between worked and reworked material. For example, if a tiger tooth falls out and you glue it back in, this can be seen as maintenance, however if you replace it with a tooth from a different tiger, this is seen as reworking. If a specimen is unworked, and not reworked since 1947, you will need a licence, but not if it was worked before 1947 and has had no further work, or only maintenance carried out on it. With a cased specimen you can carry out whatever work needs doing on the case, but as long as the specimen has not been reworked you will not need a licence. This is an area of much confusion and needless to say, in law each case is judged on its own merits.

Kim also pointed out that species are continually being added to the CITES list, so it is important to keep checking the list. Provenance is all important ('Provenance, Provenance, Provenance!'), so keeping your documentation in order is essential.

**General Licences**

A general licence (GLO2) will allow you to transport or be in possession of a dead specimen of wild plant and animal species listed on Annex IV and II(b) of the Habitats Directive, for purposes of science or education, that would otherwise be an offence. In England and Wales taxidermists and museums must keep separate records of all specimens, for example on an Excel spreadsheet or museum database. General licences are only issued for educational and research establishments, which museums automatically come under. For loan boxes, both the lender and the borrower must have a licence. This does not apply to Scotland, where Scottish Natural Heritage will grant you a licence if you are a taxidermist or museum.

**Bird's eggs**

This seemed to be the real hot potato of the day. How many of our museums have collections of bird's eggs with no clear idea of the legal position? And how many of us have visitors turning up on the doorstep with a biscuit tin of bird's eggs that they have discovered while clearing out the attic?

It has been illegal to take bird's eggs from the wild since 1954 and after the Wildlife and Countryside Act 1981 it was illegal to possess them. The 2004 Amendment has changed this so that now it is illegal to possess any eggs acquired since 1954. However, you can be deemed in legal possession if the eggs are held by a museum for education or research. There is no licence available for the possession of eggs.

If you have genuine pre-1954 eggs you are not breaking the law if you can prove when they were acquired or can satisfy the 'balance of probability' of age. You also need to have proof that the eggs were legally acquired. Do not accept a verbal confirmation from a potential donor of the age of a collection - no matter how convincing they appear to be, you must have hard evidence! There is no onus on museums to advise people if they are breaking the law.

**Summary**

This was an excellent day with a lot of information to absorb. The overall messages that came across were: keep good records and look for evidence of dates where you can (for example the name of a taxidermist could narrow down the date of a specimen), do not accept unprovenanced donations, and keep up-to-date with changes in the law. If in doubt, contact the experts and find out the latest information:

**Further information and contacts**

Animal Health (Chris Auger):
0117 372 8294
wildlife.licensing@animalhealth.gsi.gov.uk.
www.defra.gov.uk/animalhealth/CITES/

Countryside Council for Wales (Licensing Team)
0845 1306229
Enquiries@ccw.gov.uk

NatSCA
http://natsca.info/content/natural-science-collections-and-law-0

Natural England (Wildlife Management and Licensing Service)
0845 6014523
wildlife@naturalengland.org.uk

Northern Ireland Environment Agency (Wildlife Licensing Unit)
028 9056 9605

Scottish Executive (Wildlife Management Team)
0131 2446549
specieslicensing@scotland.gsi.gov.uk

Scottish Natural Heritage (Ben Ross)
01463 725245
Ben.Ross@snh.gov.uk

Taxidermy Law Company (Kim MacDonald)
www.taxidermylaw.co.uk

**Disclaimer**
I have no background in law and the information in this article is from notes made at the Taxidermy Law seminar. It is not intended as a guide to wildlife or taxidermy legislation. Please direct any questions regarding the law and licensing to the above contacts.

**Acknowledgements**
I would like to thank Clare Brown for organising the day, Leicester Museum for hosting the event, and Chris Auger and Kim Mac-Donald for leading us through the minefield of wildlife legislation. Thank you also to Tony Irwin for his support and to the NatSCA committee for providing the bursary so that I could attend this seminar. I am very grateful to colleagues for comments on the draft and to Chris Auger for comments on the section relating to her talk.

# Audiences achieved - the Museum Resource and Learning Centre in Herefordshire two years on

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## Introduction

Herefordshire Heritage Service came into being in its current format with 1998 local government re-organisation, taking back a county museum service role that it had relinquished in the 1974 local government boundary changes. From 1974 to 1998, the service had served only the City of Hereford.

The new expanded service saw staff striving to deliver collection care in far from satisfactory conditions, but access for staff to collections was difficult to say the least, and for the public very limited indeed due to the following factors.

1 Collections stored at over 12 dispersed sites
2 Different sections of collections in different buildings and within them, on many different floors
3 Offices and stores at different sites
4 No lift access to stores
5 No climate control
6 No disabled access to the sole meeting room

Plans were put in place to address these issues, culminating in the Museum Resource and Learning Centre project. This three phase project created a purpose designed facility from what had been a 1950s telephone repeater station. Located in central Hereford it has brought all collections storage and staff onto a single publicly accessible site and created a learning centre within the complex. With capital funds from Herefordshire Council and a significant investment from the Heritage Lottery Fund, the construction phase of the project was completed, collections were moved in and the building was officially opened by Princess Alexandra in April 2008.

The author has written extensively on the development of the centre in previous editions of NatSCA News, which have told the story of the risk assessment approach taken to planning the facility and the story of the design and build.

## The Audience Development Plan

An Audience Development Plan, commissioned and written in 2004, formed part of the original bid to the Heritage Lottery Fund. This was developed by the consultant Annie Hood following interviews and workshops with amongst others, staff, stakeholders, special interest groups, volunteers, senior managers and non-users. The ADP identified a number of key audiences and the offer that should be made to them.

1 General Public – family groups and tourists
2 Education sessions – primary, secondary and further education/higher education
3 Adult learning – special interest groups and Friends
4 Researchers and specialists
5 Volunteers
6 Minority ethnic groups
7 Low income groups

With construction completed, and collections back on-site (though not necessarily in the correct locations), a full service to the public started in January 2008 using the ADP as a blueprint for facilitating access. With the site open to the public, it was also possible to apply to move from provisional Accreditation to full Accreditation under the MLA scheme.

**The ADP review**

After eighteen months of operation, we commissioned an evaluation and review of progress. Annie Hood re -interviewed the original consultees and analysed the performance against targets achieved. A revised ADP was created to provide a plan for the way forward.

It was concluded that most targets had been met and many had been exceeded, but that the service was at risk of becoming too reactive to demands as people become aware of the facility and what it had to offer.

The following sections describe the types of access offered to the range of audiences and the lessons learned from two years of public access to the facility.

**The general public**

The centre was never intended to become a tourist destination or a visitor attraction in its own right, but instead to provide a base to support the offer at our existing sites.

The requirement of being "open to the public" to meet Accreditation requirements did however cloud the approach we took in the first couple of years of operation. In our first 18 months of operation, we had opened from 10am to 4pm on weekdays, attracting the occasional visitor, but most visitors had come with a query. It was rarely possible to align the enquirer with the relevant staff member at their first visit, since all work part time.

Following the review of the ADP, we have moved to a system of curatorial drop-in days, with two mornings a month from 10am to 1pm clearly advertised as covering specific collection areas and staff required to set this time aside in the diaries. This means that we can deal with identifications and donations on the spot, reducing the backlog of un-collected identifications or un-wanted donations and saving the enquirer a return trip. We can provide drop-in access to the stores on these days to answer a quick collection enquiry and with the relevant staff on duty; appointments can be made there and then for return visits.

Our audience sector for high volume visits to the site is the family audience with events badged originally as "Open Days". These consisted of an overall theme and a range of activities to include store tours, sections of the collection showcased in the learning room, demonstrations and hands-on activities. We ran eight or nine such days in the first two years with themes as diverse as Earthly Treasurers, Toys, Ready Steady Dig, Sounds Great, Destination China, Heritage Open Days, Inventions and Out of this world.

We benefitted significantly from being able to market these events as part of the Renaissance West Midlands Hub "Family Friendly" brand. This was particularly effective when our events coincided with a major marketing campaign that included bus-back advertising, radio and newspaper adverts and targeted mailings to BME and C2DE addresses. Our July 2008 event for national archaeology week attracted our biggest attendance to date (303 people) and resulted in people travelling as far as 50 miles cross-country to attend.

Open day events however were and remain very staff and resource intensive and attendance was very variable (Table. 1). We also realized that serious enthusiasts attracted by the chance to see the showcased items did not enjoy sharing the space with small children wielding gluey paint brushes and sprinkling glitter. As a result we have streamlined our approach to deliver three large scale drop-in activity days in the long school holidays aimed at a family audience and to supplement these with booked shorter sessions for children in half terms and the summer holiday. We have also decided to concentrate on an adult audience for Heritage Open days.

In future, we feel it would be better to market these large scale events as Activity Days and aim to attract 150 to 200 participants to each event. We will build on partnerships with the Herefordshire and Worcestershire Earth Heritage Trust and specific projects such as "Overlooking the Wye" so that we can share audiences and widen awareness of each other's activities.

The Easter event is therefore always likely to have a geological theme and the July event, an archeological theme (to tie in with National Archaeology Week) (see Figs. 1-5). In the run up to the 2012 Olympic Games, the July events also co-incides with the Open Weekend.

Improved access to collections for staff, the regular tours we hold and systematic storage of like material stored with like has meant that all staff have gained a much better understanding of the collections. This has

**Fig. 1.** Atrium of Resource Centre set up for "Volcano" open day in April 2010, with our partners, the Herefordshire & Worcestershire Earth Heritage Trust display and merchandise for sale.

resulted in being able to complete a re-display of our permanent exhibition and to date to create two major object based shows in the temporary exhibition gallery and numerous single case displays and "collections interventions" from our own material into touring exhibitions. For example, the "Tooth and Claw" photography exhibition of predators provided the perfect show case for natural history taxidermy, this summers monsters and mythical beasts children's workshop has a wide selection of biological forms on offer as inspiration from a Wooly rhino tooth to a goat skull.

Natural history material is also a regular feature of the exhibitions created for the Mobile Museum. A creative learning approach is adopted to these displays, with objects selected to tell the story of the exhibition, rather than necessarily for the reason they were collected. Examples from the herbarium of twigs and foliage form part of the years' Folklore and Fairy Tales' exhibition and a study skin of a rat for instance has been a regular exhibit in exhibitions as diverse as hedgerows and the bi-centenary of the slave trade. The site provides secure parking and a charging facility for the Mobile Museum on its Herefordshire tours. The vehicle is part of a fleet of three shared between nine authorities in the West Midlands - Herefordshire's vehicle is shared with Shropshire.

**Education sessions**

The service has built up an education service since 1998 which has a good track record of working with primary schools in the county but had not developed an offer for secondary schools.

**Primary Schools**

A new primary school session "Britain since 1948" was created to run as an all day session at the centre and has been well received but numbers booking remain low. "The Magic Turtle" an art and literature session was developed using the print collection (including several prints featuring animals, landscapes and plants) as inspiration for poetry and print making for KS2 secondary school pupils, although feedback is excellent, it too has received disappointingly low numbers of bookings.

We are currently undertaking the West Midlands pilot for a roll out of "Take one Object" a schools offer first developed by the National Gallery around single painting. Our iconic 2.4 m long sturgeon specimen has been selected as the object and the first professional development session with teachers created great excitement.

The offer to schools across cultural services is about to be reconsidered – in a largely rural county with small schools and declining school budgets, trips out to our sites seem hard to market.

**Secondary and Further Education/Higher Education**
Further Education (FE) and Higher Education (HE) Art College and blacksmithing students now undertake familiarisation tours as part of their induction. This results in regular requests by individuals for return visits to study collections as source materials for projects – including many natural history requests. The results displayed at the end of year art college show certainly include lots of natural science inspiration.

In the last year, we have started to work more closely with the Art College and have issued three live briefs for museum service projects resulting in a leaflet design, an interventive exhibition and three short films for the mobile museum display.

We have also been able to offer to re-run relevant adult learning seminars delivered via the WEA as repeat sessions for the blacksmithing students.

**Adult learners**
We offer three types of interaction for adult learners;

1. A general introductory talk followed by a tour of the centre or a tour of particular sections of the collection, supported for bigger groups by tea and cake served by our Friends group.

These tours are popular with local history societies, WIs, Friends, U3A, other museums, Probus and special interest groups. In order to manage groups, we require two members of staff per ten visitors and we ask visitors to leave bags and coats in lockers before entering the stores. We are also considering offering tours to school groups to look at specific items. Currently around 50 groups a year (500 individuals) visit the centre via this route.

The benefit is a dawning of understanding of the nature of museum collections and their needs in storage. Visitors are always impressed by the size and organization of the larger stores. A major disadvantage however, is that the natural history store, as the smallest store and the only one without compactor racking can only be shown comfortably to one or two visitors at a time.

A charge is made for group visits.

2. In depth taught session with collections access – for two years we have run a spring series of morning seminars (2 to 2.5 hours long) where the presentation is prepared by the curator and the theme explored through the collections displayed in the seminar room.

University for the Third Age and WEA (Workers educational authority) have both used this facility with lecturers either drawn from museum staff or external tutors. Natural science topics have included "What's my habitat", "Introduction to geology" and "History of Geology in Herefordshire". Preparing the sessions and in particular getting out and replacing the specimens is time consuming, but it does allow collections to be inspected closely. For natural history collections, the use of specimens in this way harks back to the specimen rich displays of nineteenth century museums.

A charge is made for seminars, in the case of WEA, we charge for staff time and room hire, WEA charge for attendance. WEA are interested in exploring partnerships with other museums to deliver similar activities.

3. Practical workshops – to date these have concentrated on mainly on textiles with a hugely popular course on making a Victorian corset (run three times), a group of workshops on different techniques linked to a summer exhibition of quilts and other sewing techniques. From "Countryside to cabinet" has covered insect collecting and mounting and has been run twice. Again, a charge is made for workshops.

**Researchers and specialists**

These individuals now have access to a dedicated research room and our specialist library. Visits are pre-booked although drop-in access is now possible for short preliminary enquiries. The research room is monitored by CCTV and researchers are supervised, especially with high risk items such as eggs. We were averaging around 200 individual research visits a year, although with drop-in access starting this year, this seems to have decreased. Drop-in enquiries have recently started to be monitored, in two months, eleven in-person identifications were dealt with.

In person research visits are not charged for, but we are considering charging for staff time of more than twenty minutes to undertake a research query received remotely.

**Volunteers**

Volunteers are an essential part of our service and come in two forms;

1. The work-experience placement – normally one week for school students, up to six weeks for students on undergraduate or postgraduate courses.

Students with us for a week undergo a carousel of activities and work shadow front of house, learning and collections functions. Those with us for longer periods will do a week of service familiarization before concentrating on specific projects. We have hosted up to 40 work placement students in a year, but as a result of the ADP review, are now offering opportunities at set periods rather than responding to requests. Even with a limit of 25 placements a year, this equates to a work experiences student with us once every two weeks.

2. Regular long-term volunteers – these support the work of curatorial staff and report individually to them and undertaking specific projects (Fig.2). Currently we are averaging 20 to 25 individual volunteers with us each month, with each member of the curatorial team supervising at least two or three volunteers, textile volunteers tend to work in groups. As a result of the ADP review, we have now decided to cap volunteer numbers at 30 on the books at any one time. We are however, nearing completion of the relatively unskilled re-packing and collection sorting tasks and now need to move to a point were volunteers are concentrating on data entry and delivering strategically planned objectives. These may mean that some volunteers are no longer able to work for us.

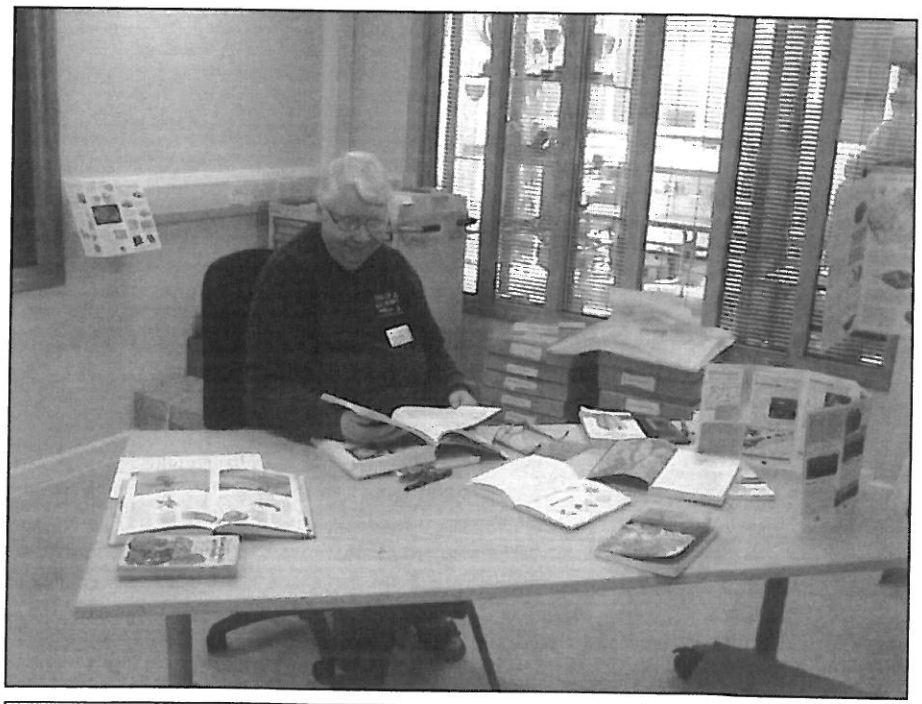

**Fig. 2.** Tess Ormrod, our regular geology volunteer – on this occasion identifying geology specimens at an open day.

Often individuals who come as work experience students or researchers will go on to become long term volunteers. Sixth form students for example can opt to do a regular community volunteering slot and one of this summer's work experience student, who photographed the herbarium sheets has elected to return on Friday afternoons to continue working on this collection. Volunteers contribute in excess of 2,000 hours a year of work to the service the equivalent of 1.5 additional full time members of staff.

**Ethnic Minority groups**

When the audience development plan was first put together in 2004, Travelers were the largest minority ethnic group in Herefordshire, followed by the Chinese community. By the time the centre was completed in 2008, with migration from Eastern Europe following changes to European boundaries in 2004, the minority ethnic make up of Herefordshire had changed significantly. The service already had good links with Travelers in advance of work on the centre and has continued to assist with Traveler family history events

We have approached reaching BME audiences and raising awareness by working with the wider Cultural Services to develop a "Destination" brand, concentrating an open day and a series of events and activities across museums and libraries. To date, we have hosted Destination China, Destination Japan and Destination Africa. The 2011 theme is Destination Poland.

**Low Income users (or C2DE socio-economic groups)**

The metal detectorist community was identified as a key low income group amongst our potential users and indeed data from the first couple of years of Portable Antiquities scheme demonstrates that in fact most reporting is from socio-economic groups D and E, traditional non-users of museums. We have hosted dedicated behind the scenes visits and talks for the local metal detector society, although the group prefer to meet in a local pub. The finds liaison officer for the Portable Antiquities scheme has recently moved has surgeries to the centre, to tie in with the drop-in days.

We choose to partner with WEA to deliver our adult learning programme as the organisation as a policy of providing subsidised training for low income users. We have attracted a few participants due to this who might otherwise struggle to attend.

The Hub Family Friendly targeted marketing campaigns to BME and C2DE audiences was extended to Herefordshire & Worcestershire in 2008 and meant that for the first time, we were part of a large scale targeted marketing campaign. We certainly noticed a difference in audiences for the promoted events.

With increasing budget restrictions and the need to recover costs, we continue to offer free entry to our open days and a number of free activities, but increasingly we are seeking to recover £1 per head per activity that we need to purchase materials for. Ensuring a mix of free and paid for activity ensures that we do not discriminate against lower income users.

**Table 1.** User data from April 2007 to August 2010

| Activity | April 07 –March 08 | April 08-March 09 | April 09 –March 10 | April 10 – Aug 10 |
|---|---|---|---|---|
| Individual researchers | 141 | 257 | 223 | 70 |
| Pre-booked tours no/ no of individuals | 40/357 | 46/517 | 58/592 | 22/245 |
| No of Open days | 5 | 7 | 8 | 3 |
| Open day visitors | 366 | 887 | 774 | 353 |
| Volunteer hours | 1699 | 1939 | 2226 | 1268 |
| Work placements | 5 | 27 | 40 | 13 |
| Meetings | 122 | 236 | 217 | 104 |
| Total visitors | 1063 | 2785 | 2701 | 975 |

**Where do we go from here?**
The review of our audience development plan basically advised that the future direction should be made up of less activity but more purpose, and indicated that action was needed in the following areas.

1 Marketing strategy and an awareness campaign needed
2 Family Friendly activity days restricted to three or four a year in main school holidays
3 Volunteer numbers capped at thirty, more strategic approach taken to work programmes, travel expenses to be met
4 Proactive approach to work placements, no more than 25 a year
5 Customer care training for all staff based at the centre
6 Develop staff skills in creative learning
7 Some sessions for schools to continue to run from the centre
8 20 meetings or courses a year for adult learners
9 Orientation visits continue for HE/FE students, build stronger links with the colleges
10 As ethnic makeup of the county changes, activities for BME and low income groups need to keep pace with the changes
11 MRLC activity and targets at the hub of service activity

We have embraced the findings of the report and this year will be running only three family friendly open days plus the open day aimed at adults for Heritage Open Days in September (Fig. 3-5). As budgets continue to be squeezed, we are concentrating our open day efforts on week days in the longer school holidays, thereby avoiding having to pay staff to work over the weekend. Selling our offer continues to be or hardest task - we have good routes for marketing visitor attractions and an established primary school age audience, but activity for adults that requires booking and payment continues to be a struggle.

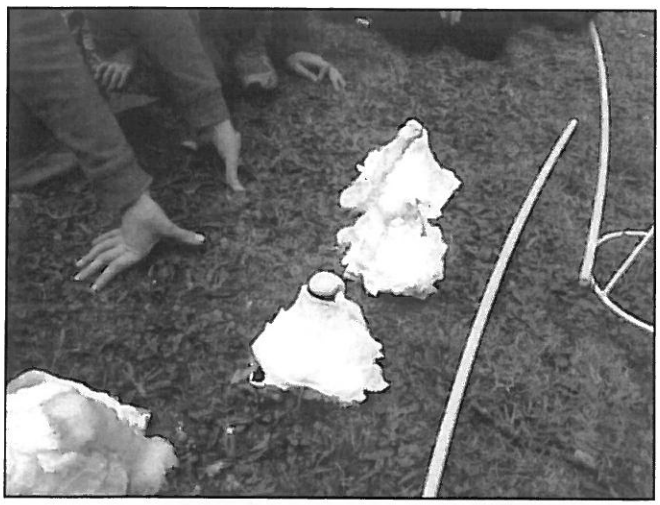

**Fig. 3.** Mini bicarbonate volcanoes at the "Volcano open Day".

**Fig. 4.** Giant bicarbonate volcanoes at the "Volcano open Day".

**Fig. 5.** Devonian fossil scenes created by participants at the Volcano open day - incorporating volcanoes, simple land plants and armoured fish.

Although our natural history collections are fairly small - constituting around 10% of our total holdings, we continue to use them extensively in all of our activity and ensure that audiences continue to be achieved.

# News from the Royal College of Surgeons: A new habitat for the Odontological Collection Primates

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## Introduction

Since the Odontological Museum at the Royal College of Surgeons of England was deinstalled in 2003, the majority of the 11,000 plus specimens have been kept in storage. This short report will detail the progress of the primate collection. As research demand for the collection escalates, it has become an increasing priority to provide a stable, secure and easily accessible environment for this material. Thanks to a generous donation from the Royal Society of Medicine, Odontological Section, the primate collection has since become the focus of such a storage renewal project. This funding will enable each one of the 3,000 skulls to be individually packed into new lock-lid transparent plastic boxes. Conservation is the foremost concern, although ease of access and an economic use of space are inevitable considerations for new museum storage.

## A monkey Reshuffle

Reboxing began in October of 2009 and almost the entire primate collection has been loosely re-boxed into taxon order. The lengthy task began with the great apes last year and has continued down the species spectrum to the lemurs and bush babies. The intention is to regroup the material into a taxonomic sequence, irrespective of pathology, and to improve the storage of this unique comparative anatomy resource so that it rivals research collections across the globe. Over the past year, the primate material has become one of the more actively used reserve collections at the Royal College of Surgeons. Recent research has centred around evolutionary studies and primate pathology. Attempts have been made to generate a wider awareness of this material within the academic community and it is hoped that such use of the collection will now increase.

## New Storage

Storage renewal is scheduled to be completed by the beginning of 2011, culminating with the smallest primates in the collection, the mouse lemurs (Fig. 1). Owing to the wide range in species, the recently implemented storage system has had to take skull size into account. Initially the process was straightforward; one box comfortably fits one male gorilla skull or two male orangutan skulls.

**Fig. 1.** The new storage shelves and boxes holding the repacked primate material.

However, matters became more complex for accommodating the smaller primates. Subsequently a system was established using correx shelves to form layers within each box that are supported by thick plastazote plinths. A protective plastazote layer then forms the support for each skull, an impression of which is sliced into the foam to hold the specimen in place (Fig. 2). Each layer accommodates six to eight crania, depending on species size. This format prevents any weight being placed on the skulls and maintains minimal movement within each box (Fig. 3).

**Fig. 2.** *Cercopithecus nictitans* monkeys in their new storage of lidded plastic boxes, supported on plastazote.

**Fig. 3.** *Cercopithecus nictitans* monkey skulls in their new storage, showing the plastazote and corex levels.

The online catalogue details all of the material held within the museum's collections (http://surgicat.rcseng.ac.uk/). The reboxing and recataloguing of the primates is an ongoing project and use of the collection by researchers continues as usual.

# A new documentation initiative within the National Museum of Ireland – Natural History Division

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## Introduction

The National Museum of Ireland (NMI) consists of four divisions: Irish Antiquities, Art & Industry, Irish Folklife and Natural History. The state-run National Museum of Ireland was founded as the Science and Art Museum in 1877 to manage the growing collections of the Royal Dublin Society (RDS), the Royal Irish Academy and Trinity College Dublin (Monaghan, 2000). The oldest natural history specimens in the Royal Dublin Society were acquired in 1792 (Monaghan, 2007; O'Riordan, 1983). Following the creation of the Irish Free State, the Science and Art Museum was renamed as the National Museum of Ireland in 1922.

The natural history collection of the NMI is split between two buildings. The publicly accessible museum on Merrion Square houses exhibits and the entire insect collection, as well as additional zoological and geological specimens in storage. Another building located in Beggar's Bush just over a kilometre away, contains the rest of the zoological and geological collections. These buildings are estimated to house roughly two million natural history specimens (Monaghan, 2000). The NMI's botanical collection was transferred to the National Botanic Gardens in 1970 (Monaghan, 2000).

In 2007, a report by the Comptroller and Auditor General (Comptroller and Auditor General, 2007 p. 23) emphasised the need for a complete collections record to be created:

> "The NMI needs to establish a plan to address its incomplete collection records. This should contain a statement of the current documentation situation, an estimate of object numbers or records to be processed, a statement of retrospective documentation to be performed and the timescale and resources needed to update the collection records."

As a result, the NMI put in place a five-year Documentation Plan, of which a museum-wide inventory project was a central part. This project officially started in September 2008 and is scheduled to run for five years. The aim is to have an inventory of the whole collection, whereby each object corresponds to a record. The project is being managed centrally by the NMI Registration Department and implemented by separate teams within each museum division. Each division contains a team of documentation assistants under the supervision of a documentation officer. This project will ensure that documentation throughout the museum meets SPECTRUM standards, the UK. standard for collections management (McKenna and Patsatzi, 2009).

This article presents an overview of the documentation procedures currently being practiced within the Natural History Division (henceforth referred to as the Natural History Museum).

## Historical context - documentation within the Natural History Museum, Dublin.

Since 1877, specimens have been allocated a two-part registration number upon their accession into the collection. This registration number consists of the year of accession, and a sequence number indicating the order of accession. For example, the second specimen to be registered in the year 1909 was allocated the number 1909.2. These two-part numbers were noted in the register and in most cases included on a label with the specimen. Custom sometimes dictated that the year be placed second, so a specimen numbered 1909.2 may also appear as 2.1909. Information related to the taxonomy, provenance, donors, and collectors may also have been noted in the register and on a label attached to the specimen. These registers now form part of the NMI archives and paper registers are still used for new accessions. As systematic registration in this style was not in place before 1877, many specimens within the collections are unregistered. A large proportion of museum specimens accessioned after 1877 are also unregistered, mostly as a result of understaffing. In many other cases, specimens have been registered, but the connection between the specimen and register entry has subsequently been lost, making the determination of their original registration number problematic. This may be because specimen labels were never written, or have become detached, damaged

or lost. Over the years various paper-based or computer-based catalogues have also been compiled for some parts of the collection by curators and constitute a further source of information about the collection.

**Inventory project – procedure**

The following account outlines the inventory project protocol. The procedure can be divided into four discrete stages (Fig. 1).

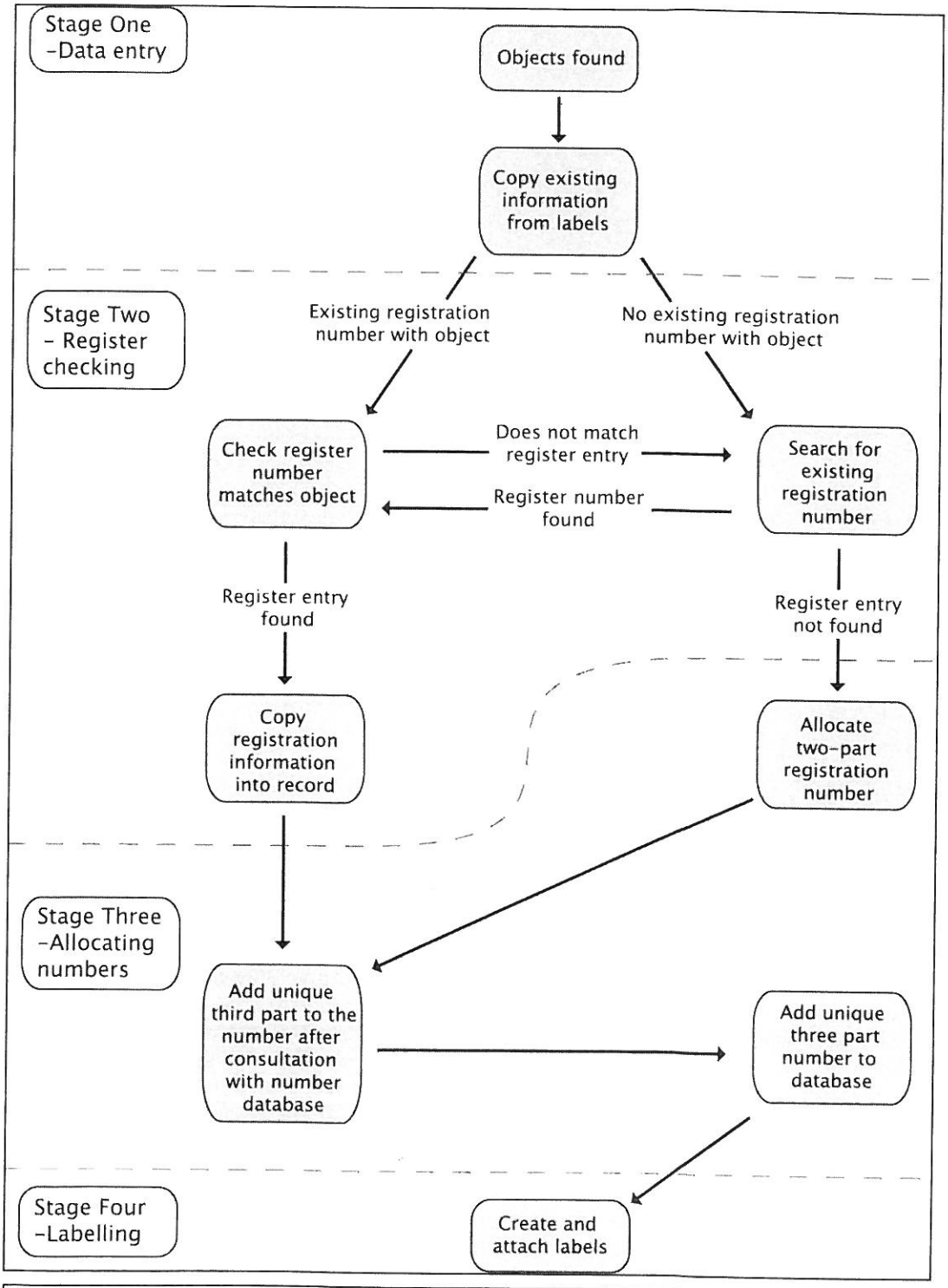


**Fig. 1.** Flow chart illustrating the documentation procedure within the National Museum of Ireland - Natural History Division.

*Stage 1. Location-checking and data input*

The documentation team moves systematically through the collections by location (Figs 1 and 2). Data is copied into an Excel spreadsheet from the labels of a manageable number of specimens. A manageable unit may be a storage cabinet or a display case, and typically consists of between about fifty to two hundred specimens. The data is structured in a format suited for eventual importation into an Adlib database (see "Progress and future direction" below). To meet a basic inventory-level standard, the following information fields are mandatory: registration number, storage location, storage unit, form (e.g. is the specimen mounted, in a round jar, bagged, etc.), object name (a general identification or common name, e.g. bird, mollusc, ammonite, etc.) and preparation (e.g. taxidermy, dried, formalin, etc.). When a registration number is present with the specimen it is recorded. The dated initials of the recorder are also included. If no registration number can be found with the specimen then a new registration number is allocated at stage 3. Additional information about each object is recorded only if it is written on an existing label. The existing catalogues are also consulted and any information therein is incorporated into the spreadsheet.

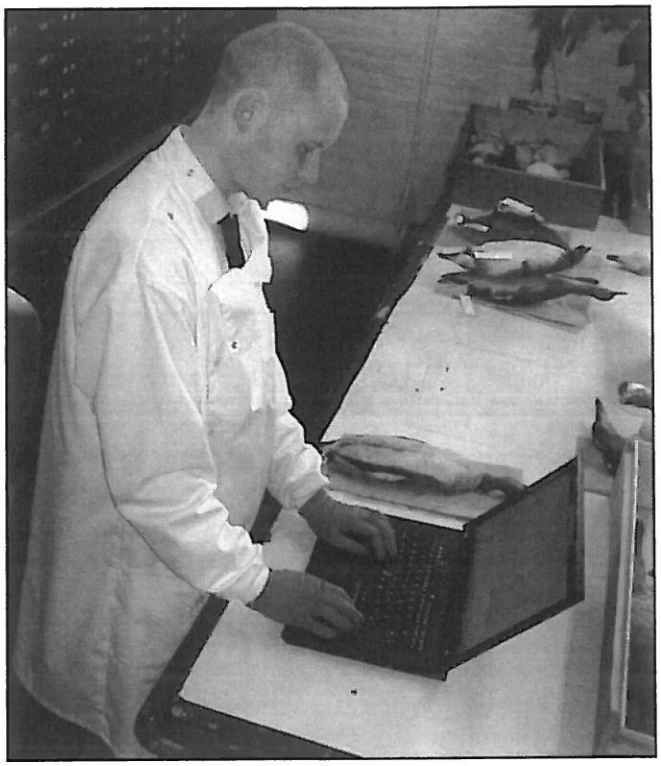

**Fig. 2.** A documentation assistant inputting data on bird skins.

*Stage 2. Register checking*

The gathered information is compared to and supplemented by information in the museum accession registers (Figs 1 and 3). Should the details in the register correlate with those on the specimen label, it is inferred that the number is correct and additional information from the register is added to the database. On rare occasions, the information from the specimen label does not agree with the register. In these circumstances, the mistake is far more likely to have occurred as a transcription error on the original label or during the data input stage. After double-checking what is written on the label and finding that it is still contradictory, a systematic search of potentially correct register entries is conducted. The original registration number for unnumbered specimens may be determined at this stage by a similar systematic approach using any information found associated with the specimen. Donor, date or locality information may prove useful for this purpose.

*Stage 3. Allocating new numbers*

Sometimes, a large number of specimens were accessioned in bulk, all being allocated the same two-part number. In these instances, it is frequently noted in the register that, for example, "a large number of marine invertebrates" were accessioned at this time. The practice of allocating the same registration number to a large quantity of individual specimens often resulted in several specimens having the same two-part registration number. In order that each specimen within the collection be accounted for, and easily found again,

it is important that they have unique numbers. To do so, the two part registration number is treated as a "stem number", with the date listed first. A third number is then added to the stem number in order to create a unique three-part number. For example, individual specimens with the stem number 1906.113, described in the register as "a collection of bird skins (52 specimens)", become 1906.113.1, 1906.113.2, etc. A prefix is added to these unique registration numbers to show the international institution code (NMI) and the collection the object belongs to (NH for Natural History). The full registration number mentioned above therefore becomes NMINH:1906.113.1.

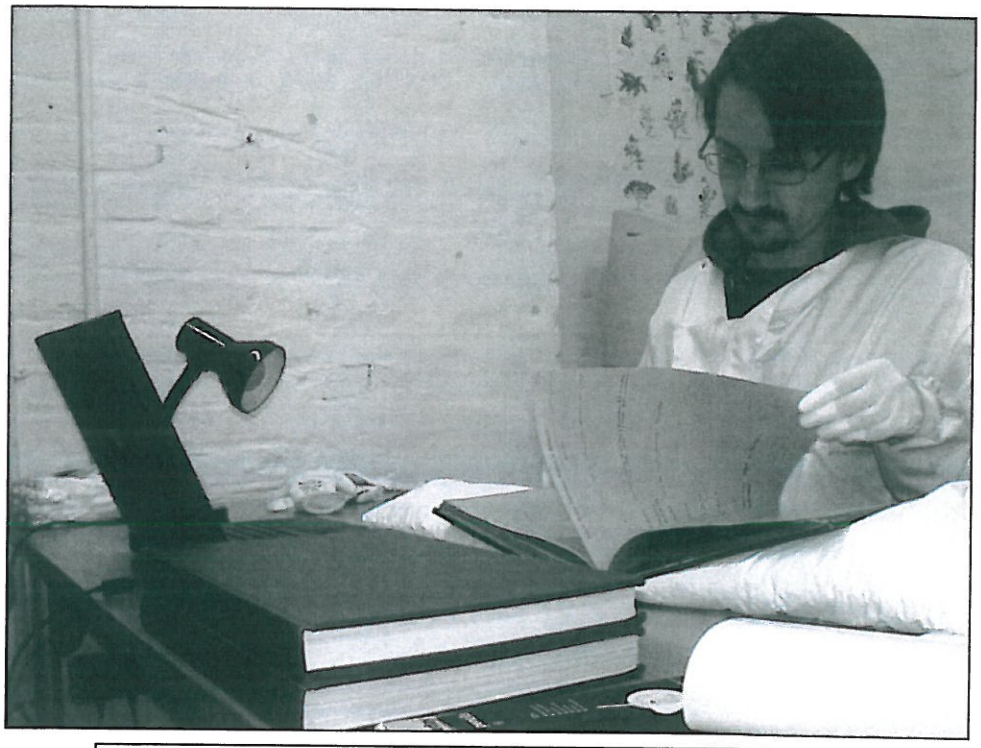

**Fig. 3.** A documentation assistant checking that data and numbers match the registers.

If an original registration number cannot be found, then the specimen is recorded into the register under a new two-part number. Obsolete and incorrect numbers are recorded in the notes for the specimen in the database. All numbers are retained in case they were previously used in a publication, or correspond to a different numbering system (for instance, a collector's list or a registration system from another institution).

*Stage 4. Create and attach new labels*

The new three-part numbers are hand-written on specimen labels and attached to the appropriate specimens during this final stage (Figs 1 and 4). The specific type of label and the method by which they are attached to the specimen differs depending on the type of specimen. In cases where a specimen had been found to have an incorrect number, the incorrect number is neatly crossed out but remains legible. This avoids future confusion without completely removing the erroneous information. All old labels are retained with the specimen.

**Exceptions and special cases**

*Temporary numbers*

Parts of the Natural History Museum consist of extensive collections of small and delicate specimens housed in jars and drawers, e.g. dry insects on pins, microfossils, microscopic specimens in tubes of alcohol, and microscope slides. These need to be handled by curatorial staff to avoid damage or destruction of the specimens. It would be unfeasible to allocate a unique number to every one of these specimens given the timeframe of the inventory project. As a result, temporary numbering series accommodate these containers. As well as having a different prefix (NMINC) they follow a different format to registration numbers so that they cannot be confused. These temporary numbers represent the cabinet and drawer number if appropriate and contain code to indicate the content of the container (Fig. 5.)

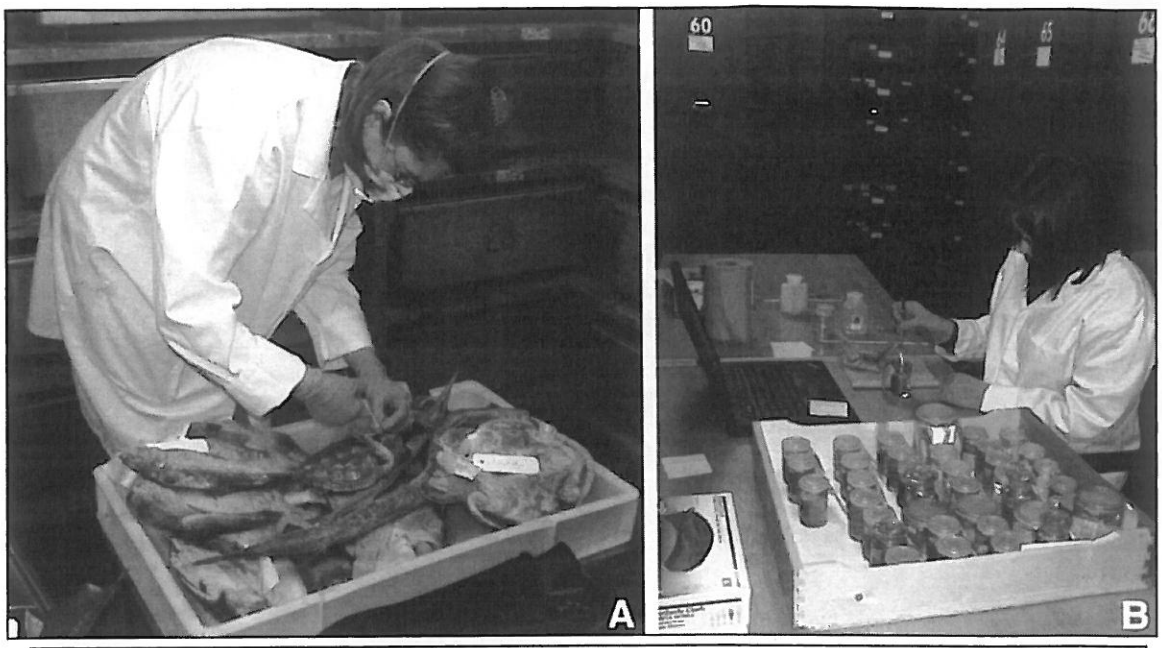


**Fig. 4.** Documentation staff labelling specimens with new numbers. A. large specimens in spirit tanks; B. invertebrate specimens in jars of spirit.

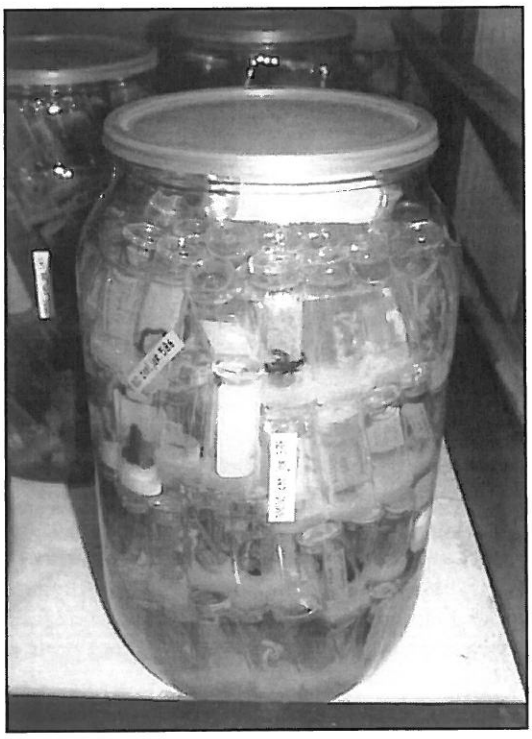

**Fig. 5.** Example of a container with a temporary number; a large jar containing several tubes (note that both dry and wet labels are present).

*Separated specimens*

Many vertebrate specimens were separated into bones and skins during their incorporation into the museum collection. In these cases the separate parts are frequently located in different areas of the museum and separate data entries are produced for each. Because they are part of the same animal, both parts are given the same three-part number. However, an additional suffix is added to their numbers in the database to distinguish between them and to denote their nature (e.g. bones, skin, skull, etc.). Once the Adlib database is operational (see "Progress and future direction" below), these data entries will be reunited in a single record to describe one specimen in multiple parts and locations.

*Location and movement control*
A location and movement control procedure has been introduced as part of the inventory project. Specimens may be moved only with explicit authorisation from a curator, or in the absence of a curator, from the keeper. The person moving the specimen is responsible for recording data related to the move, and for reporting these details to the documentation officer. The documentation officer, or a designated documentation assistant, will update the database to reflect the location change.

**Progress and future direction**
There is currently no specialised electronic database program within the Natural History Division. In the 1990s, MODES was used to catalogue the geology collections, but all other attempts to database the collection have been restricted to basic word processing and spreadsheet programs (Excel). This key issue is currently being resolved: Adlib-museum, a dedicated collection management computer program, is used elsewhere in the NMI and will be extended to the Natural History Division in time. In the meantime the documentation team undertaking the inventory project is temporarily compiling data in Excel in a suitable format to be imported later into the NMI Adlib database.

In September 2009, the first of a series of planned Inventory project audits within the NMI was carried out. Selected documentation staff audited work carried out in a division other than their own. The audit was carried out on a random selection of samples. Accuracy was assessed using a bi-directional approach: 1. confirming whether the correct specimens could be found based on the information in their database record, and 2. confirming whether specimens selected from the collection could be found within the database. 99% of the 600 natural history specimens tested in the first audit met inventory standards.

Documentation of all the zoological and entomological specimens in Merrion Street started in September 2008 and was completed in January 2010. As of January 1st 2010, a total of 38,007 specimens have been documented. The inventory resulting from this project will assist researchers and curators in their efforts to study and maintain the collection, and the database will eventually be published online to allow the information to be accessed by a much wider audience.

**Acknowledgements**
We wish to thank Paul Doyle, Registrar, and Raghnall Ó Floinn, Head of Collections, for valuable comments and suggestions.

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# Beneficial Beetles Project: Cataloguing Coleoptera at the Potteries Museum

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**Natural history collections at Stoke-on-Trent Museums**

Stoke-on-Trent Museums, a collective of four council-run museums spread across the city, house a wide and varied collection. The Potteries Museum and Art Gallery is the main museum for the city. Well known for its nationally important collections of Ceramics (both local and world-wide), it is also home to collections of local history, archaeology, fine and decorative art, and natural history; the other museums in the city hold collections of social and industrial history. All collections held in Stoke-on-Trent museums are Designated. Although the collections are spread across many museum sites in the city, only the Potteries Museum houses natural history collections; these are divided into Geology, Botany and Zoology. The Zoology collection consists of 350 mammals, 1,850 birds, 5,000 birds' eggs, 20,000 land snails, 2,000 freshwater bivalves, 450 arachnids, 18,000 Lepidoptera, 4,000 Diptera, and 24,000 Coleoptera; as such, the beetle collection makes up the largest section in the zoology collections.

The Coleoptera collection was acquired mainly through the donations of private collectors. The collections of Charles Ernest Stott (1868-1935) and Maurice Waterhouse (1939-2003) make up the majority of the specimens. Currently, both of these collections are held in the storage cabinets and boxes that they came in; in the case of the Stott Collection, the cabinet is a part of the historical context of the collection. The Waterhouse Collection consists of local specimens from the Staffordshire area, although there are also many specimens from Kent, Wales, Scotland and Bulgaria; additionally, Waterhouse acquired specimens from other collectors which may be of historical interest.

**The Beneficial Beetles Project**

As part of the Beneficial Beetles Project, funded by the Designation Development Fund, I have been appointed for the next 6 months to formally catalogue and conserve the Coleoptera collection held at the Potteries Museum. Specifically, I will be working on the Waterhouse Collection. Overall, this will involve:

1. improving storage conditions of the collection
2. adding specimen data to the collections database (MODES)
3. working with partner organisations

Currently, the Waterhouse Collection is housed in the cork-lined drawers and boxes that it arrived in (Fig.1). Over the course of the project specimens will be moved from these boxes to new archival plastazote -lined specimen boxes, and entomological cabinets and drawers (Fig.2). In the process, each specimen is given a record number, condition checked, and grouped into taxonomic order.

The Potteries Museum currently uses MODES for Windows as its collections database software, although there are plans to upgrade to MODES XML in the near future. Data from each specimen will be put into MODES. As Waterhouse did not keep additional notebooks, all data relating to each specimen is recorded on a card pinned with the specimen, so there is only basic data to be entered into MODES. This usually consists of locality, date of collection and the initials of the collector.

Once a large dataset has been created on MODES, it is hoped that the specimen data will be used in partnership with the Staffordshire Ecological Record and the Staffordshire University Institute for Environment, Sustainability and Regeneration in looking at changes in habitat over the last half century. In addition, there are plans to instigate biological surveys of the local beetles and habitats, involving local wildlife and conservation groups, and the general public.

As this is a short-term funded project, it is hoped that the majority of the aims and outcomes are achieved by the end date, which is the 31st March 2011.

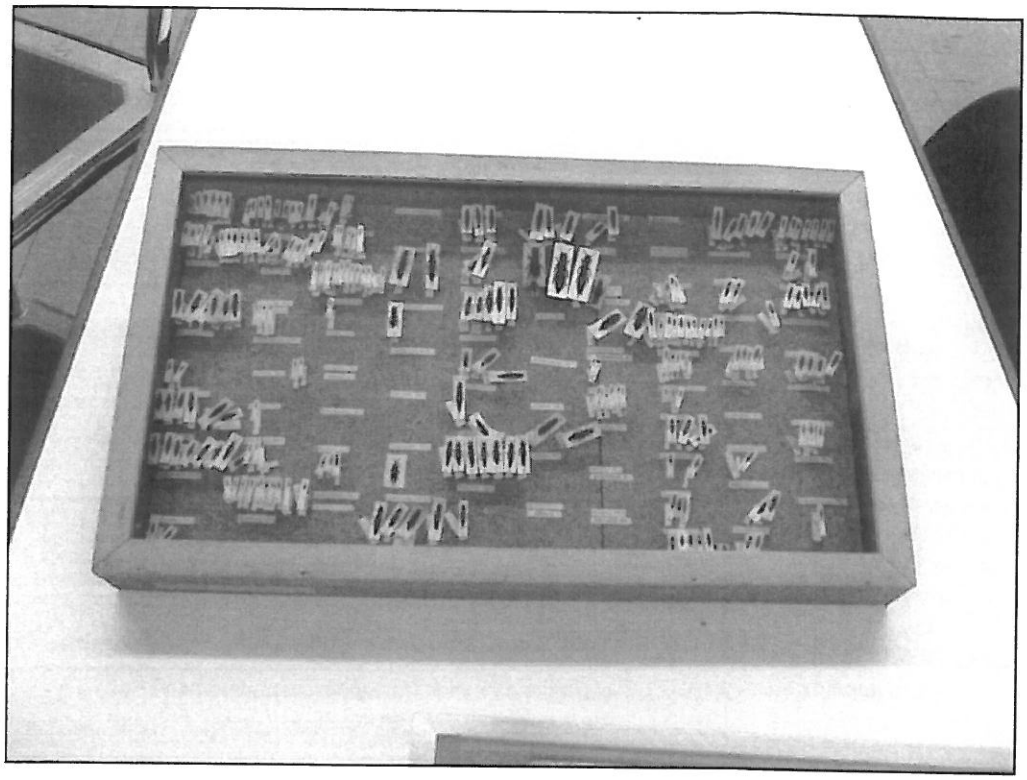

**Fig.1.** Original storage as bequeathed to the Museum.

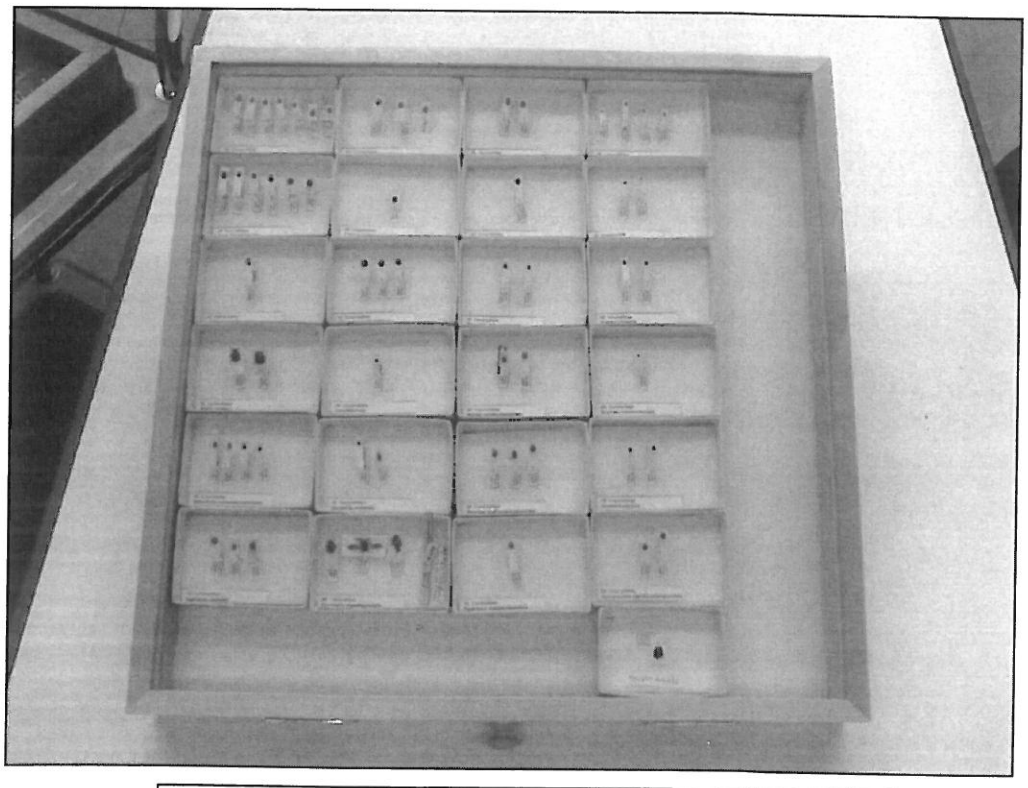

**Fig.2.** Improved archival storage in entomology drawer and plastazote-lined trays.

**Preliminary findings**

The project has been up and running now for just over a month, and as such is far from completion. Even so, some interesting outcomes are already evident. From a scientific view-point, the range of localities and habitats represented by the collection is wide and varied, ranging from the Staffordshire Moorlands and Kent marshes, to the Cairngorms and Welsh peninsulas. The range of dates is also important, giving a view of habitats across time, from the early 1970s up to 2002. Although the collection contains specimens from most groups of Coleoptera, the Staphilinidae particularly are particularly well represented.

From a history of collections perspective, the Waterhouse Collection is also interesting as it contains specimens from historic collectors. Waterhouse's own specimens are labelled up with small strips of card with data written in pencil (Fig.3). Specimens collected by Thomas Herbert Edmonds, Alan Brindle, Harold William Daltry, Walter Douglas Hincks, David W. Emley and Robert Wylie Lloyd are all easily recognisable as they usually still have their original labels (Fig.4a-f); Edmonds specimens are readily identifiable by being mounted not on card but on small strips of Perspex. Specimens collected by Charles Ernest Stott have also been found in this collection and have been returned to the Stott Collection. Mysteriously, many of the Stott specimens have been given what I have been calling 'pink labels'; these appear to be poor quality paper and ink which has deteriorated, either through age or damp, to a pink colour (Fig.5). Usually, these are found associated with specimens collected by Stott, although they have been found on specimens from other collectors too, as well as on data-less specimens. Additionally, they usually carry the locality of either Coombes Valley or Bolton Gate (both localities in Staffordshire), and a date sometime in either 1972 or 1973, and the initials MW. These pink labels, however, carry data that is, on the whole, inconsistent with the specimen with which they are associated; for example, Fig.5 shows a Stott specimen with a pink label attached that says 'Bolton Gate, 1972, MW', whereas the data on the base of the specimen states that it was collected in 19.6.1934, in Cromer, Norfolk. Unfortunately, as Waterhouse does not seem to have kept notebooks, the significance of these pink labels remains unclear.

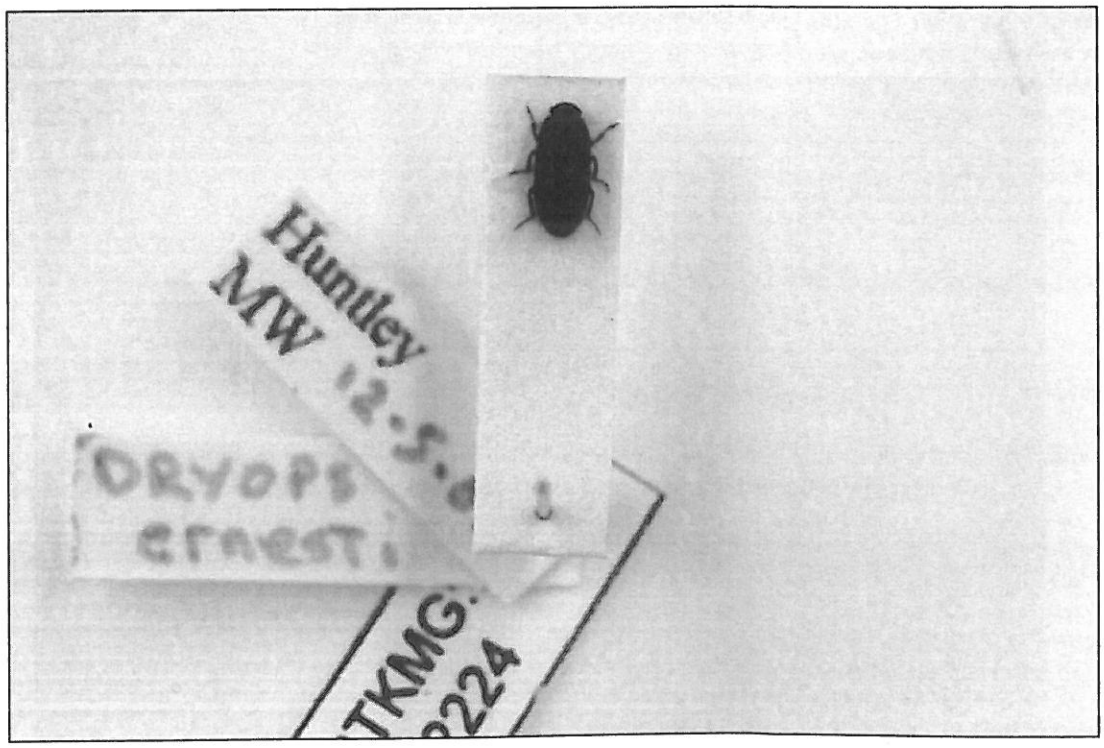


**Fig.3.** Example of a Waterhouse label.

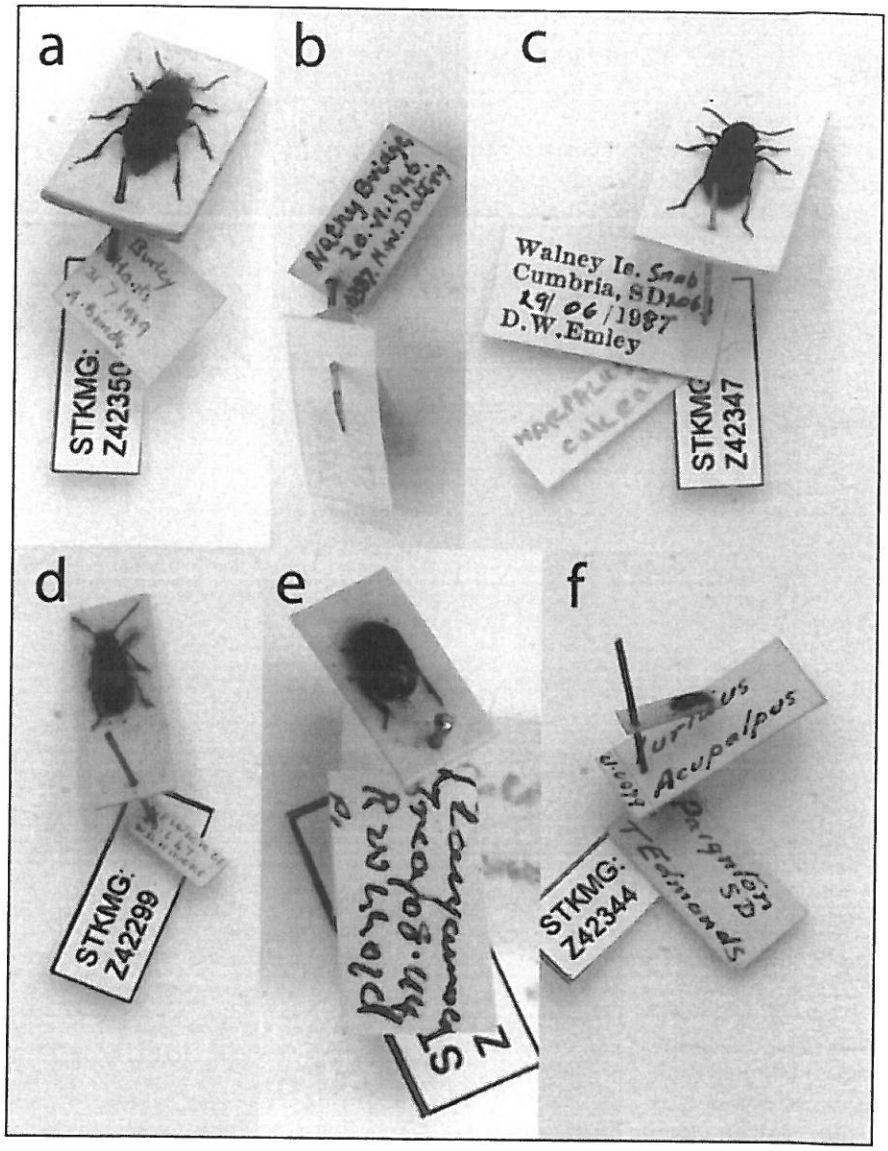


**Fig.4.a.** examples of labels of known collectors found in the Waterhouse Collection. a. Alan Brindle; **b.** Harold William Daltry; **c.** David W. Emley; **d.** Walter Douglas Hincks; **e.** Robert Wylie Lloyd; **f.** Thomas Herbert Edmonds.

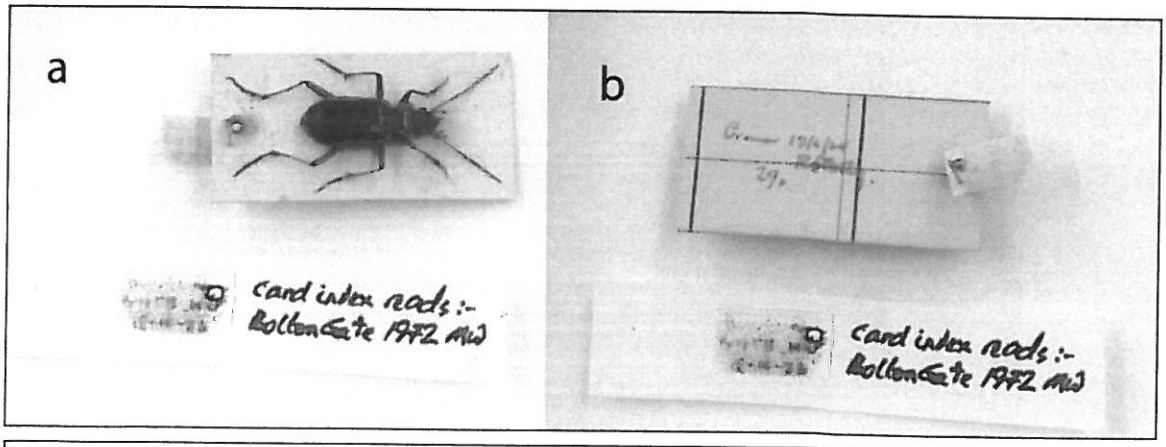


**Fig.5.a.** an example of a 'pink label'. **b.** the back of the specimen attached to the 'pink label'; as can be seen, this is actually a specimen from the Stott collection.

Other collectors are more difficult to identify, either because they did not initial their specimens or because their names do not appear in the Biographical Dictionary of British Coleopterists (http://www.coleopterist.org.uk/). These include A.F. (Fig.6), J.R. le B.T, Johndown (spelling uncertain), M.L, Luff, S. Shaw, C.S., P. Tatt, S. Swain, C.E.T., W.E.S., Sidebotham, M. Shields, R.N.H., and A.J. Purcell (Fig.8 a-m). Others, despite being from old collections and having distinctive labelling, do not have collector names or initials on them, so currently remain a mystery (Fig.7). Additionally, a few specimens seem to be ex-museum specimens; specifically, duplicates from the Manchester Museum (Fig.8 o-p).

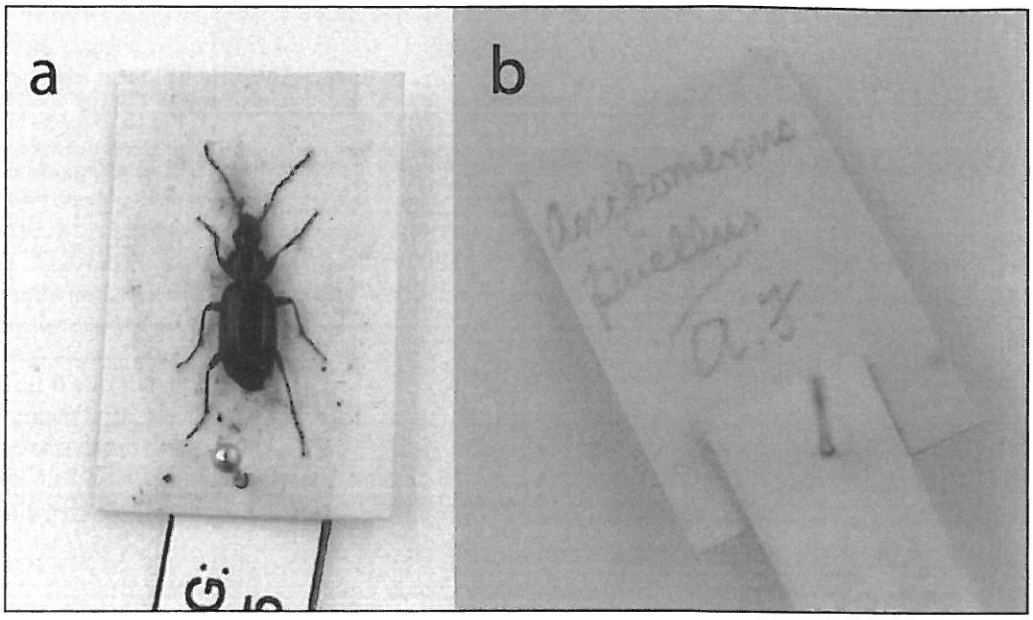


**Fig.6.** Example of a specimen from the A.F. collection; all specimens from this collector are labelled and initialled on the reverse of the specimen card. **a.** obverse; **b.** reverse.

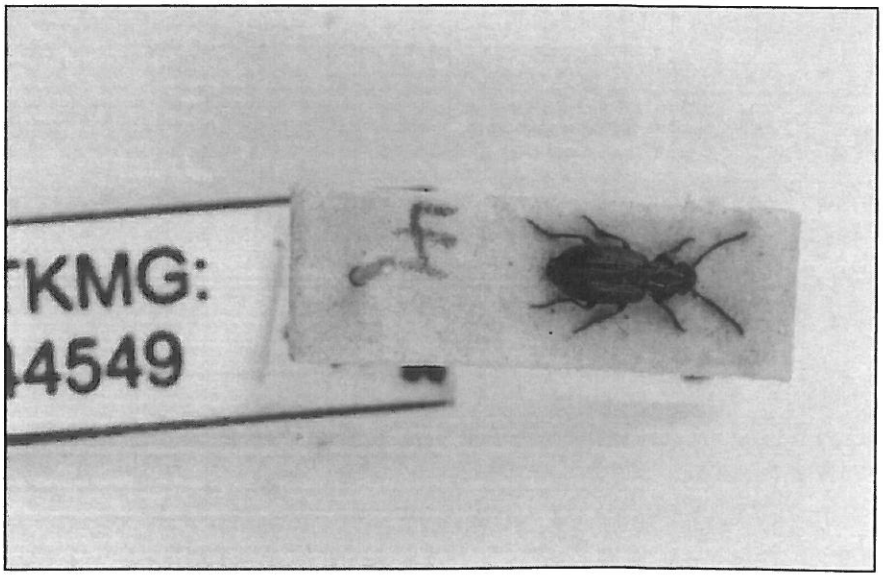


**Fig.7.** Example of a specimen from a mysterious collector; no names are found with these specimens, just a number written in pencil next to the specimen.

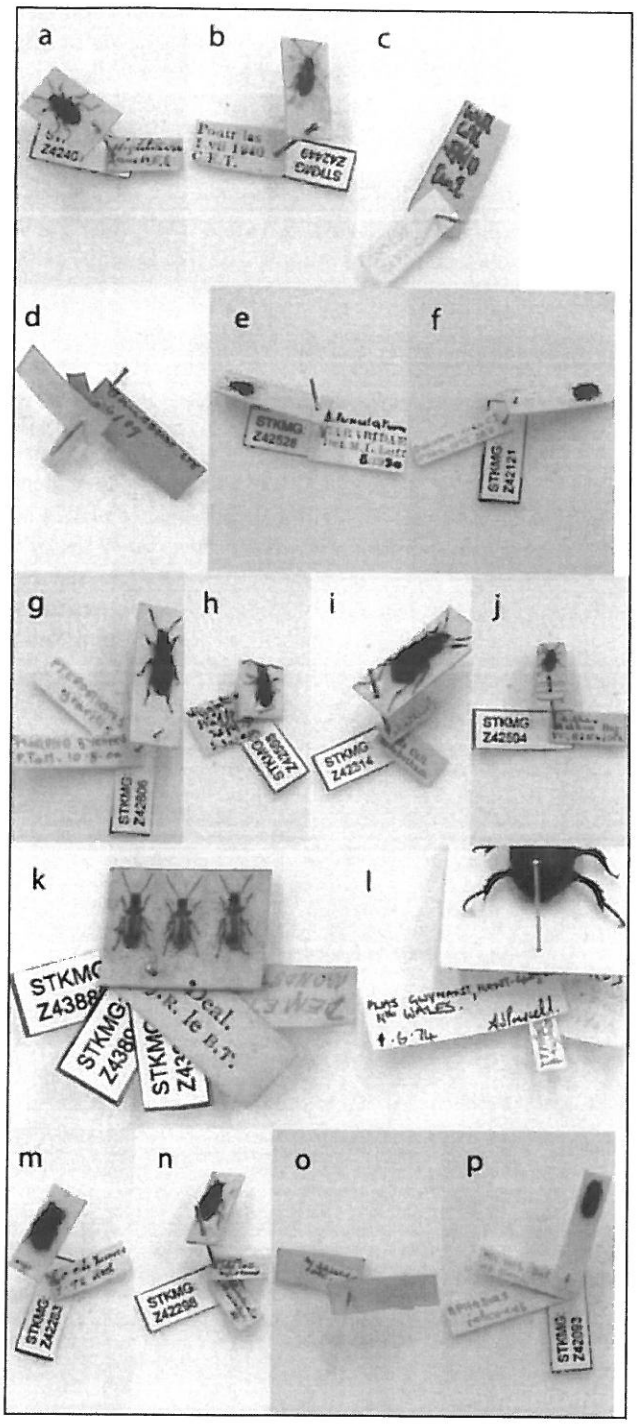


**Fig.8.** Examples of labels from unknown collectors and museums found in the Waterhouse Collection. **a.** W.E.S.; **b.** C.E.T.; **c.** Will; d. Johnsdown; **e.** Luff, M.L.; **f.** C.S.; **g.** Tatt, P.; h. Swain, S.; **i.** Sidebotham; **j.** Shaw, S.; **k.** J.R. le B.T.; **l.** Purcell, A.J.; **m.** R.N.H.; **n.** Shields. M. (obverse); **o.** Shields, M. (reverse); **p.** Manchester Museum duplicate.

## Preliminary conclusions

Although there is still a lot of work to be done on the Beneficial Beetles Project, some initial conclusions on the collection can be drawn. Firstly, the wide range of specimens, both in species, localities and dates, gives a good basis for many avenues of research into changes in habitat and ecology over time, especially for the Staffordshire area. From the collections viewpoint, systematically going through each specimen during storage improvement work has allowed for individual specimen condition reporting and research. On the whole, the collection appears to be in good condition, especially taking into consideration the age of some of the specimens from older collections. These specimens from older collections also allow for research into historic coleopterists, some of whom may not be widely known. It may be that other collectors' specimens may be found in this collection, adding to our knowledge not only of species ranges over time, but also to our knowledge of the history of Coleoptera collecting and collectors.

**Acknowledgments**

Thank you to the Designation Development Fund for funding this project, and to all the staff at Stoke-on-Trent Museums for all their assistance. Thank you to the Beetles-BritishIsles email discussion group for all their assistance.

# Recently released ID guide - Marine Bivalve Shells of the British Isles

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## The Project

In 2006 the Department of Biodiversity and Systematic Biology at the National Museum of Wales began a project to produce an identification guide to the bivalves found in British waters. This project, funded by the Department of Energy and Climate Change (formerly the Department of Trade and Industry) was to create a taxonomic tool for use by biologists and ecologists carrying out Environmental Impacts Assessments (EIAs) in locations that are likely to be exploited for oil and gas. Correct identifications in these EIAs are essential, however, most benthic samples include juveniles and minute species, which can be very tricky to identify. Large illustrations and size series are required in many cases to show enough detail to separate species. To provide full colour plates to cover all of these requirements would make a publication expensive so a web-based product was decided upon. An electronic product has the added advantage of being quick and easy to update and amend.

## The Website

In June of this year the open access website was released, with illustrations and descriptions of 360 species of bivalves found in the waters around the British Isles (Fig. 1).

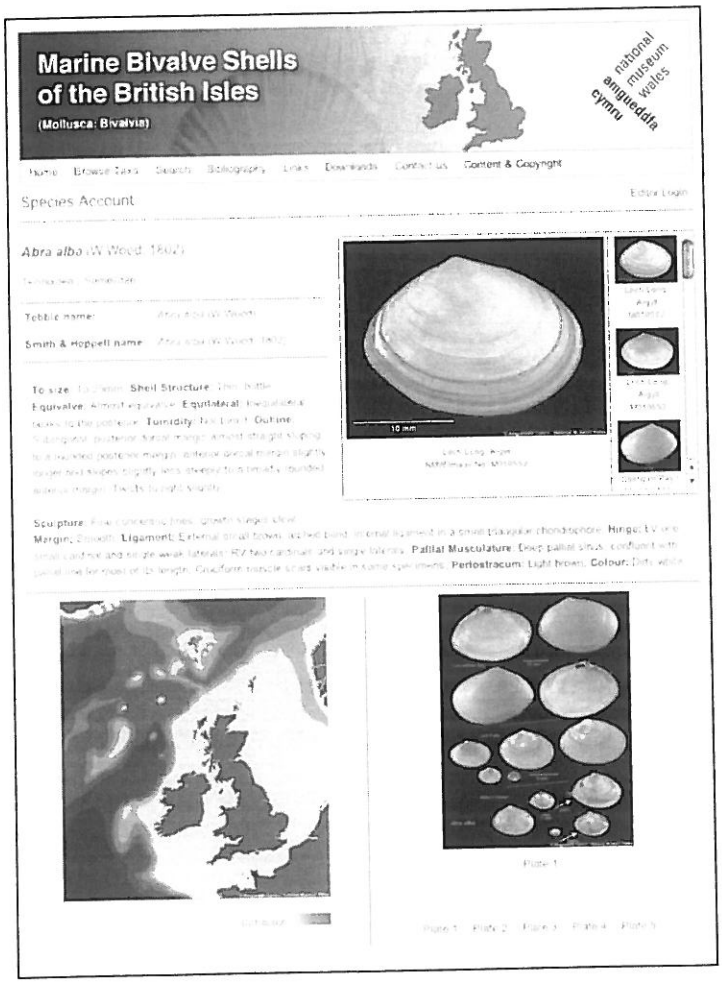


**Fig. 1.** Screenshot of a species page from the Marine Bivalve Shells of the British Isles web-site.

The last illustrated guide to British bivalves, written by Tebble in 1966, only covers continental shelf species to around 200m depth. To provide us with a comprehensive list of bivalves we used, as a starting point, a checklist written by Smith & Heppell (1991), which included Tebble's species along with many deep-water additions. This checklist teamed with recent deep-sea papers has provided us with as full a coverage list as possible (Fig. 2).

Each species page contains a full description of the shell and, where required, a description of the anatomy, along with plates showing size series, variations, shell internals and externals and distinguishing characteristics highlighted. Distribution information, maps and habitat information are also provided.

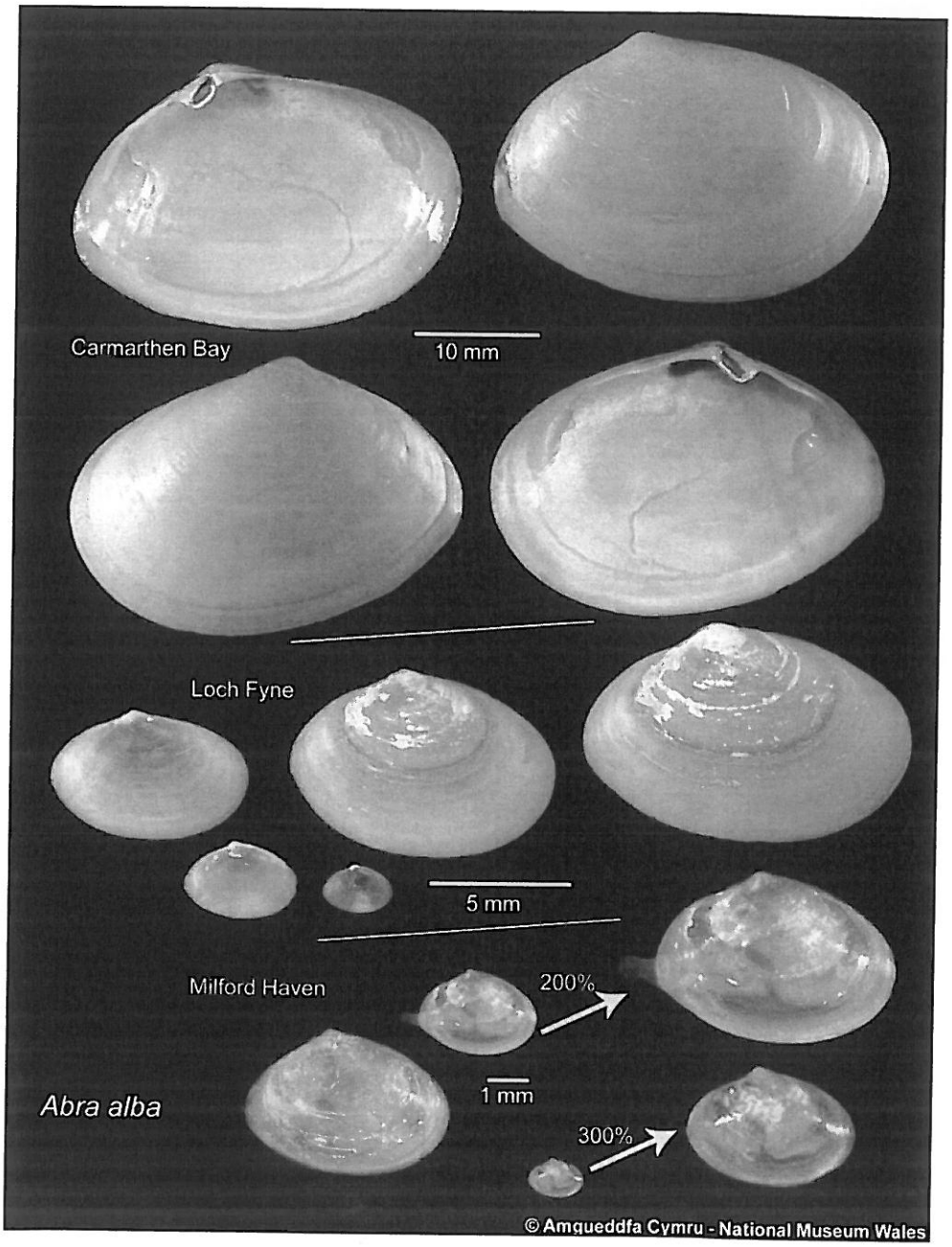


**Fig. 2**. Species plate for *Abra alba*. Includes size series images to make the job of identifying juveniles easier and more accurate.

**Geographical Coverage**

It was necessary to cover the Exclusive Economic Zone of the UK as the project was funded by the Governmental Department of Energy and Climate Change. This Zone stretches seaward from the coast for 200 nautical miles. Rockall extends the Zone westward to 24°W, the Shetlands extend the Zone northward to 64° to include the Faroes, the tip of Cornwall extends the Zone southward to 48° towards the Biscay Basin and a line is drawn down the middle of the North Sea (Fig. 3). Once squared off, this area covers deep waters to 5000m southwest of the Celtic Sea, west of the Hebrides and the Faroe-Shetland Channel. Some species found just south or north of the geographical coverage area have also been included because of the possibility of them cropping up in benthic surveys.

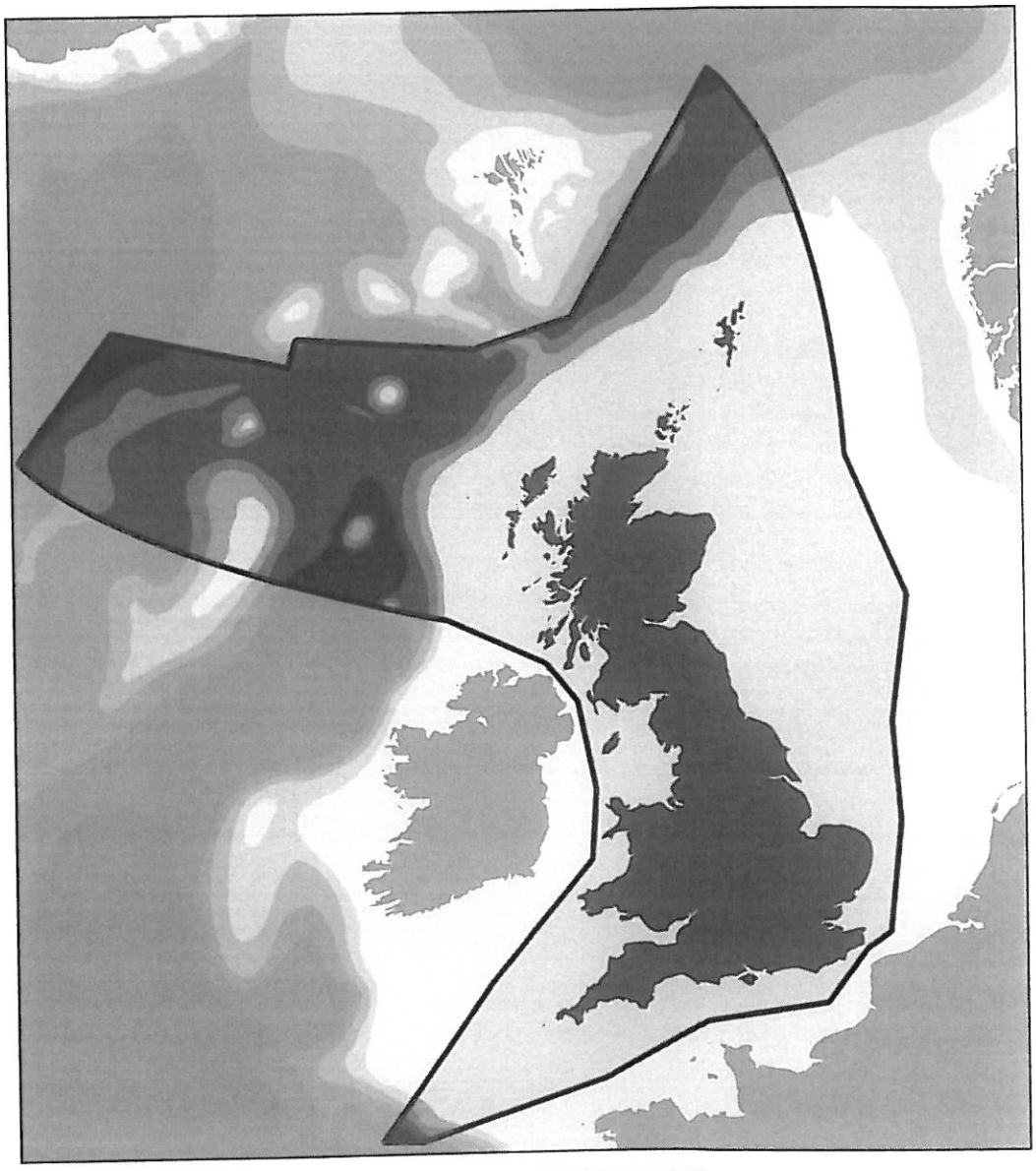

**Fig. 3.** Map highlighting the Exclusive Economic Zone of the UK.

**The Images**

Achieving a satisfactory depth of field in images of very small specimens is problematic. Images were taken using a microscope with camera attached and Automontage software™. Using this software the photographer can combine many images of a specimen taken at different focal depths into a beautifully sharp image, even for tiny or very tumid specimens. Scanning Electron Microscope (SEM) pictures showing details of hinges and surface sculpture of shells have also been included in the Guide. As well as images of the shells, anatomical pictures were taken for some groups such as the Thyasiridae, some of the genera of which can be clearly distinguished by their gill structure (Fig. 4).

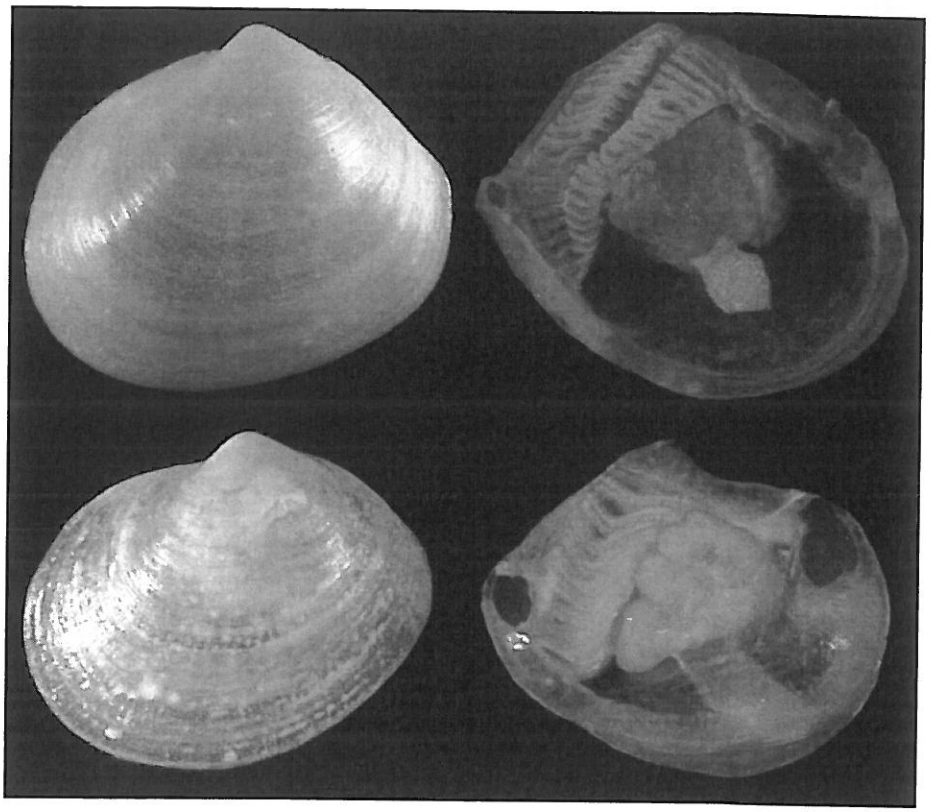

**Fig. 4.** Two different genera from the family Thyasiridae showing similarity of shells and distinguishing character of single or double demibranch gill (top left of anatomy pictures).

**Collections used for Imaging**

The majority of images are of specimens from the collections of the National Museum of Wales, which in this specialism are vast. The British material from the Museum's Melvill-Tomlin collection is placed at the end of each superfamily, which made relevant material for this project very accessible. One of our most recent acquisitions is a collection of UK shells from IJ Killeen with excellent data - most lots have grid references, collection dates, exact collection points and relevant ecological information, invaluable for the production of this type of ID Guide. We were also fortunate enough to receive a bequeathed collection of shells by JE Phorson, a large percentage of which are tiny juveniles stuck onto pieces of card, these provided material for the series of images of juvenile specimens.

Some specimens, such as those found in the very north of our coverage area, were borrowed from various institutions to fill in any gaps in our image database.

Locality data and an image number are attached to each image on our website to provide further information to the user and to allow us to find the imaged specimen in our collections if required.

**Feedback and future work**

As soon as the website was released the discovery of a species new to our area was made on the south coast of England – a Mediterranean species called *Chama gryphoides* – which was sent to us, imaged and added to the ID guide (Fig. 5). Also, a new record east of the River Humber has been added for *Coracuta obliquata*, previously known from just a few scattered locations in the west of the UK.

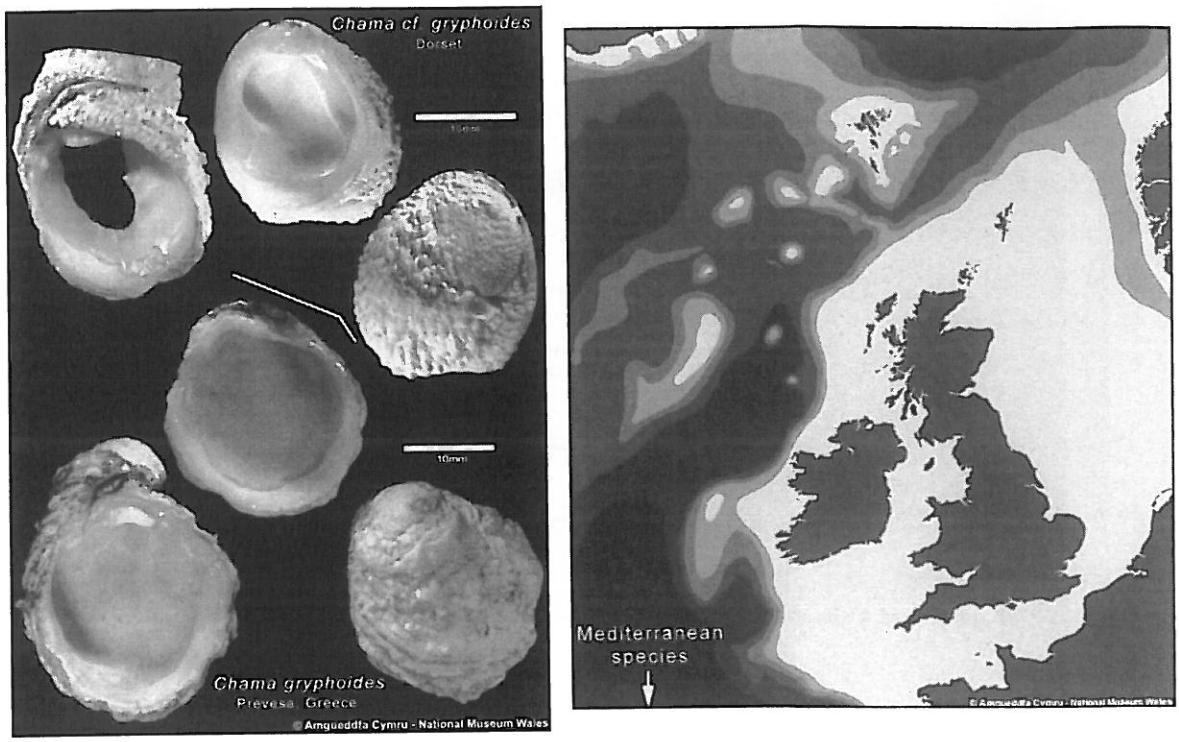


**Fig. 5.** Species plate and distribution map for *Chama gryphoides*.

We are now working on adding several keys to the Guide as well as some new species and more comparison plates. The beauty of the website is the ability to immediately add species, add further locality data to maps and any other details as they come to us. We want to encourage people to use the site and inform us of any gaps in our records.

Please feel free to visit the site and send comments to me.

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http://naturalhistory.museumwales.ac.uk/britishbivalves/

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Tebble N 1966. *British Bivalve Seashells.* The British Museum (Natural History) pp 212.

# The Darwin Centre development: Before, during and after, at the Natural History Museum, London

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## Introduction

This is the story as told by an Entomology curator who works at the Natural History Museum in London and has seen many changes there over the last few decades. I have been a resident of the Old Entomology Block, the ex Waterhouse 'Origins Gallery' and now the new second phase of the Darwin Centre and I have witnessed the end of the Old Entomology and Zoology Spirit Buildings, the rise from the ashes of the new Darwin Centre and all the moves of Zoology, Entomology and Botany specimens and staff. The site of the Natural History Museum in South Kensington has always been short of space, constrained by the original, and now listed, Waterhouse Building finished in 1881. There have been many plans and some actual builds behind the World famous 205 metre long Waterhouse frontage, to try and improve collections storage and research facilities.

## Old Buildings: The Zoology Spirit Building

The 'New' Spirit Building was built in three parts; between 1921–1922; 1928-1929, and another extension added 1934–1935, being built of Ferro-concrete, 250 feet long and 54 feet wide. It was initially planned to house Entomology collections here but the plans changed to ultimately house the Zoology Department's extensive spirit collections (Fig. 1). Some of the Zoology collections were moved in 1924 into the first, western part to be built, with Entomology temporarily using the extended space in 1930. The fish and Arachnids collections moved in 1938 from the old and cramped 'Gunthur' Spirit Building (1883-1953) on the site of the present Boiler House, after Entomology moved into their 'new' Entomology Block in 1937 (see below). The initially 'open plan' new Spirit Building of five floors was compartmentalised after the Entomology collections left, into smaller 'fire proof' units behind heavy metal doors throughout the building. Mezzanine floors were inserted in each floor on the storeroom side and a sprinkler valve fire protection system was fitted throughout. The south wall windows were blocked in to reduce heat build up from the sun and offices were inserted along the North side with the original windows kept intact. These windows overlooked the old 'Discovery' huts, built to house the extensive collections made during the HMS Discovery expeditions between 1925 -1935 (Fig. 1). However, environmental conditions were difficult to control with ambient temperatures especially on the fourth floor rising to 37° C in summer, which sometimes caused the alcohol to expand and push off the spirit jar tops, and winter temperatures plummeting to 11° C. The smell of ethyl alcohol and formalin was ever present and on occasion would be even noticeable by our close neighbours in Queen's Gate! (Portela Miguez, 2006)

## Old Buildings: The Entomology Block

The Entomology Block (Fig. 1) was built to house our expanding insect collections which had outgrown the Waterhouse basement South West corridor, even with mezzanine floors inserted (now the home to the Museum's Mollusca collections). The cramped conditions were highlighted when two Trustees, a Prime Minister and an ex-Prime Minister on a tour of inspection, became wedged in a narrow passage between cabinets and work tables and they readily agreed that things had become intolerable. The build was in two phases, starting in 1934 - 1936 and the second half started in 1938. The 2nd stage was interrupted by WW2 and left standing as a rusting maze of steel girders until 1950 when work resumed with final completion in 1952 (Riley, N.D., 1964). The completed Entomology Block consisted of six floors of reinforced concrete faced with London brick, with many windows, both on east and west faces allowing in plenty of light. This provided 67,200 square feet of new space but, initially and to the great disappointment of the Entomology Department, we had to share the building with the bird section on the lower three floors, the space only being released to us when Ornithology moved to their purpose built facility at our Museum at Tring (1971-1972). Along most of the east side, there were offices for senior staff and along the west side were bays made from assorted and often antique furniture for the junior curators and assistants. The east side office views overlooked the Waterhouse Building and to the west, we overlooked the gardens, which became the wildlife

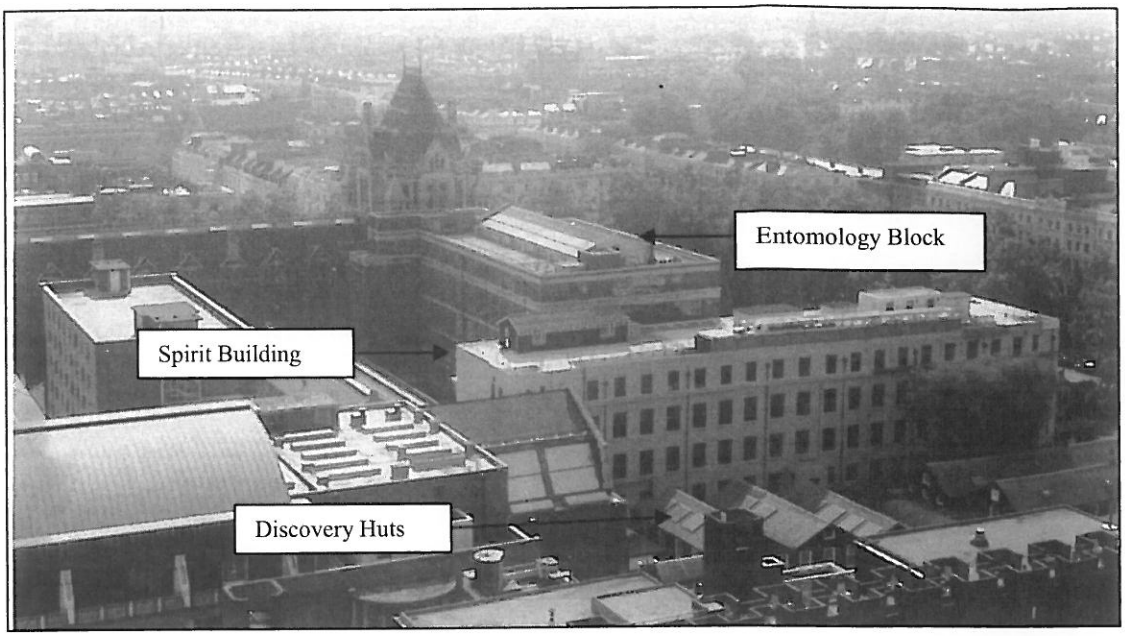


**Fig 1.** The Zoology Spirit Building (centre right),with the Entomology Block behind (centre) and discovery huts (right foreground) R.I.P! Photo taken from the Imperial College Bell Tower.

garden latterly, and panoramic views over west London. The space the birds vacated was filled with the huge Rothschild Lepidoptera collection from Tring. The cabinets in which the Entomology collections were housed, included initially 2000 old and original tropical hardwood carcasses and more recently acquired replacement chipboard and Balmforth & Stortech metal cabinets (in duck-egg blue/green) in static rows throughout most of the central area of each floor. The final arrangement of collections after many moves were as follows: fourth floor housed Hemiptera, Orthoptera & 'small orders' and the Keeper's office; the third floor held the Hymenoptera and the Entomology Library; the second floor housed the Coleoptera; the first floor part Diptera; and with the Lepidoptera on the first, ground and basement floors. In more recent years, specialist laboratories were developed within the 'Entomology block' for electrophoresis and DNA studies, microscope slide making, Diptera work and soil sample sorting. We also had labs built on the roof of the old Zoology Spirit Building for controlled environment aphid, coccid and parasitic Hymenoptera live culture rearing, a greenhouse for growing plants for the aphid cultures (since donated to the wildlife garden) and a sound proofed, audio laboratory to record Orthoptera songs.

The Entomology Block was not particularly attractive or fit for the purpose of insect collection storage, being prone to variable environmental conditions and occasional rainwater leaks. The variable quality of the cabinets and drawers and the many inaccessible dust pockets within the building, meant that there were endemic pest problems which were controlled by the use of (now illegal) insecticides. The smell of the cocktail of benzene, creosote, naphthalene and para-dichlorobenzine used to treat the insect drawers against pest attack, pervaded the whole building and staff! For a number of years there were discussions about moving our collections to better custom built accommodation elsewhere in England but this was shelved. Further discussions to replace the Spirit Building and the Entomology Block with new better designed structures on site, primarily to introduce proper environmentally controlled collections stores, to increase the space for modern research and to showcase our science to the public, proceeded and were agreed. We went out to tender and winning designs were chosen which were deemed iconic enough to attract as wide a number of patrons to help fund the 'Darwin' Centre.

**New Buildings: First Phase of the Darwin Centre**

Initially we built the first phase of the Darwin Centre (Fig. 2), to house the life sciences (Zoology, Botany and Entomology) spirit collections, to the north of the Zoology Spirit Building. This space was cleared by demolition of the 'Discovery' huts and the removal of a row of large black poplar (*Populus nigra* var. *betulifolia*) trees. The first phase was designed by HOK International with the remit that the risk of fire should be, as far as possible, designed out and was completed by November 2001 (Fig. 2). The first phase consists of seven floors of offices and laboratories along the south side with a central ground to roof atrium

(Fig. 4) and the windowless and environmentally controlled spirit storage along the north side. Time lapse doors to the store were fitted and a monitoring system for atmospheric alcohol levels was put in place and a pumped spirit supply system was plumbed into the building. New metal cabinets with wooden shelving were fitted into the spirit store areas and the contents of the Spirit Building were moved directly across into the new building through a direct link bridge cut through the Spirit Building wall and in via the new main entrance. The move was carried out by Zoology Department staff from February to October 2001 and involved 22 million specimens. Smaller specimens in 450,000 jars varying in volume from 10 ml to 100 litres remained in their jars and many much larger items were moved into variously sized tanks (Fig. 3), followed by the staff by January 2002. The building opened to the public on 30th September and officially opened by Her Majesty Queen Elizabeth on 22nd October 2002.

Fig. 2. Darwin Centre Phase 1 from Queens Gate.

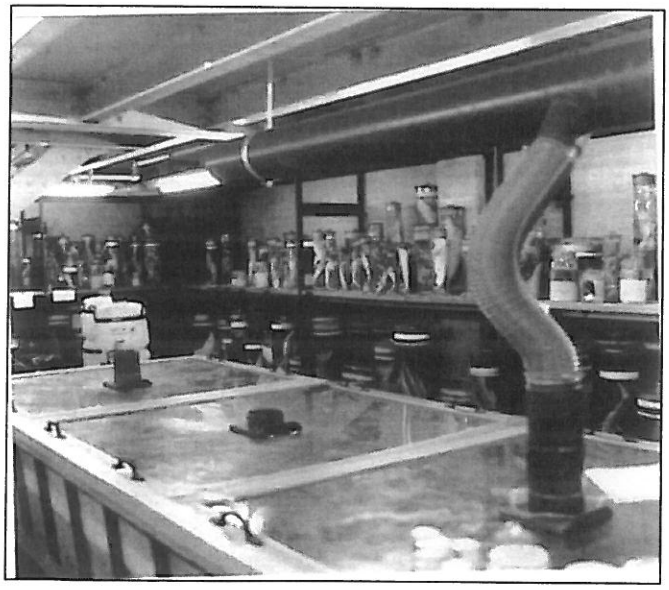

**Fig. 3.** A new spirit store room with open racking and vented tanks (photo from O. Crimmen).

Once the Spirit Building was clear, the demolition contractors moved in and encased the building in scaffolding (Fig. 5). A large crane was employed to hoist a number of hydraulic caterpillar tracked 'dinosaur like' jaw and 'driller' cranes which were placed onto the roof. Holes were punched through each floor and out of the south wall, to allow demolished rubble to fall and be loaded into trucks. We, in the Old Entomology Block, watched the slow process of demolition floor by floor and the levelling of the site, which was finally covered with a veritable Chesil Beach of pebbles to hide the remnant foundations. Many small pieces of the rubble were taken as keep-sakes by previous denizens. A temporary raised and enclosed walkway was erected to allow public access to the DC1 atrium at Ground floor level. The atrium has glass fronted display cabinets for spirit jars containing impressive specimens, and windows allow views into the ground floor store. This link from the main Museum Waterhouse Building through to the first phase was closed and removed with the start of the building of DC2.

**Fig. 4.** The DC1 central atrium.

**Fig 5.** Demolition of the Zoology Spirit Building.

**Temporary Accommodation for the Entomology 'Decant'**

Then it was the turn of the Entomology Block to be emptied and demolished but the second phase of the Darwin Centre was planned to use the same footprint as the old building. We had to empty the Entomology Block of at least 28 million specimens in 139,000 drawers and store boxes and move the collections to a number of temporary localities. The Darwin Centre move represented the largest move the Natural History Museum had undertaken since the move from The British Museum in 1882. This would mean the geographic fragmentation of the Entomology Department.

The 'Origin of Species' gallery in the Waterhouse Building was emptied of exhibits and made available for collections storage. A free standing mezzanine floor was inserted (so that the internal terracotta fabric would not be damaged) for staff accommodation above the temporary collections storage below with small 'dumb-waiter' lifts up to the mezzanine level. The Entomology 'Decant' moves started on Monday 16th May, 2005. We used our existing Hill, chipboard and metal cabinets here and moved the Coleoptera, Orthopteroid, Neuropteroid, Trichoptera, Heteroptera and Homoptera: Auchenorrhyncha collections into this space. The mezzanine floor was furnished for staff with some new cubicle units and a lot of the old and historic Entomology Block furniture (Fig.6), including glass fronted bookcases which had housed the Entomology Library. We also cleared the Rowland Ward pavilion of the African dioramas of mounted giraffe

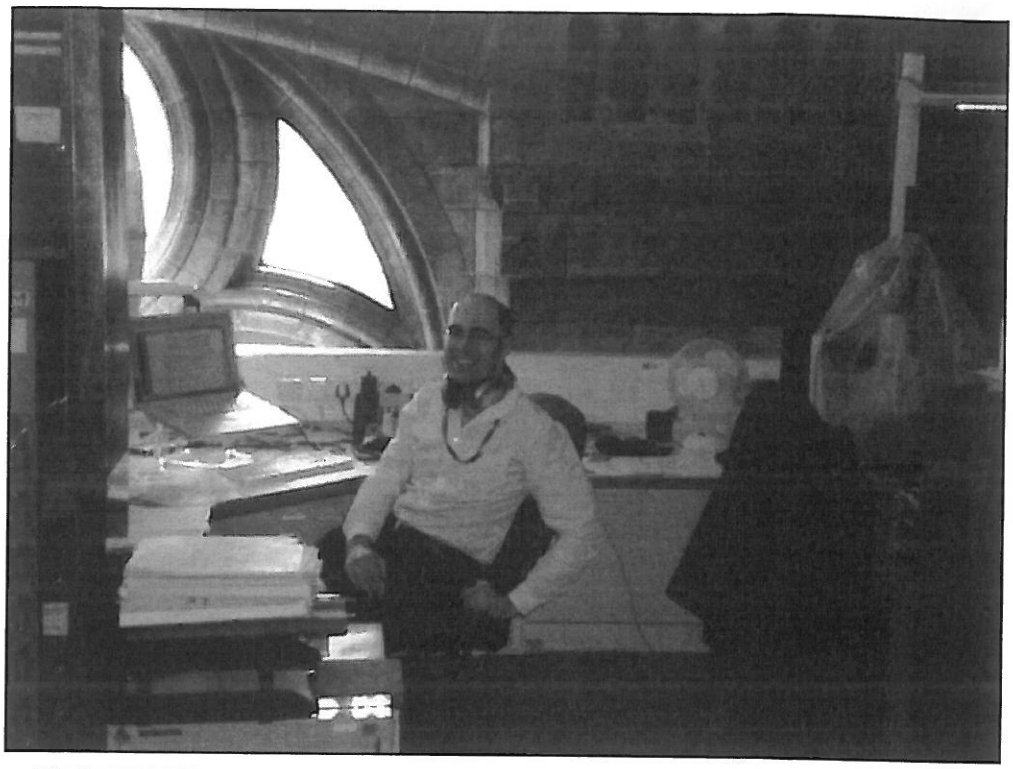

**Fig. 6.** Dr Vince Smith's 'temporary' bay on the Origins gallery mezzanine, photo courtesy of Ed Baker.

(*Giraffa camelopardalis*), okapi (*Okapia johnstoni*) and sable antelope (*Hippotragus niger*) specimens and used this space to house the Diptera collections (Fig. 7). Much of the Hymenoptera collection was moved to the windowless Spencer Gallery in the Waterhouse Building, previously available for corporate functions with valuable and very large paintings of rare and extinct birds, Incidentally, now that the move into the new building is complete, this space will be return as the Museum's new Images of Nature gallery showcasing the highlights from the Museum's natural history art collection. The British Gallery on the 2nd floor of

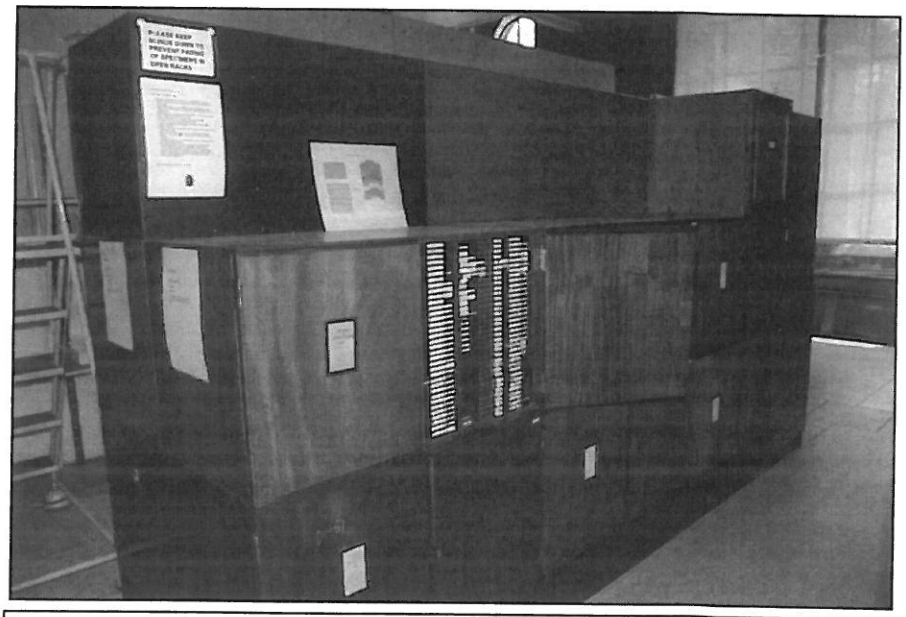

**Fig. 7.** Old 'Hill' Horizontal Diptera microscope slide cabinets in Rowland Ward Pavilion, once home to the Rowland Ward Giraffe, Okapi & Sable Antelope mounts.

the Waterhouse East wing above the Cryptogamic herbarium was emptied of its dioramas and temporary offices were built to house the Entomology Keeper's office staff, management and Trichoptera staff. Our packing room for incoming and outgoing loans was moved to the basement under the Waterhouse front 'Twin Towers'.

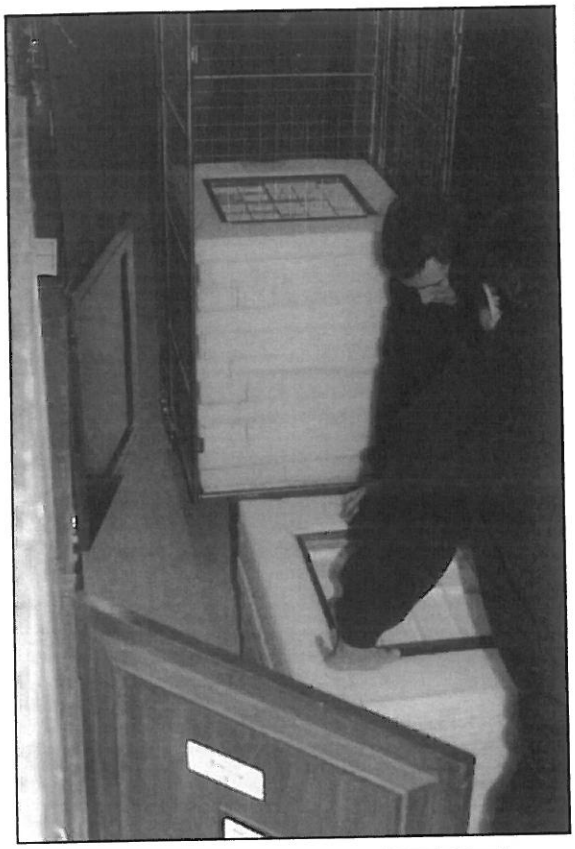

**Fig. 8.** Nexus loading insect drawers into pads and cages for removal

**Fig 9.** A Nexus lorry load of insect collection cages at the South London Store.

**Fig 10.** Mark Pearson of Nexus moving our card index files.

The windowless Oberthür room in the basement of Waterhouse (next to 'Zoology Store Room 1) was emptied of stored furniture and became our temporary store for sectional reprint collections and the Rothschild Flea and Diptera microscope slide collections. This room once housed the Charles Oberthür Lepidoptera collection and later became the setting room in the 1950s where junior staff set mostly Lepidoptera specimens. This room then had a bad reputation for pest problems. Ironically our quarantine and other freezers were latterly moved here too. We moved our DNA laboratory to the Seal Basement, under the Mammal Tower, and our Diptera culture and soil extraction labs moved into space vacated by Vaughan Southgate's biomedical parasitology section in the South West Tower of the Waterhouse Building, although permanent office and storage usage for this area was not permissible due to fire loading restrictions and lack of a lift. Our Diptera preparation and lacustrine deposits laboratory was moved to a vacant laboratory in the Palaeontology wing and renamed the Hall-Brooks Lab.

We also used the Museum's South London storage facility for our largest Entomology collection, the Lepidoptera, and the Hymenoptera: parasitica, the Homoptera: Sternorrhyncha, Psocoptera, Thysanoptera, Collembola and Phthiraptera microscope slide collections. Space was vacated by other Museum departments to allow us space in two windowless floors with environmental control. Link 51 were contracted to put in roller-racking compactors ready to take the old collection cabinets. The associated staff were housed on three floors of the office Block next door with the Entomology Library which was the first unit to move in June 2005. We had a very useful undercover loading bay in the basement, although unfortunately this area suffered from back flooding from the drains on occasion. Many of our staff who lived in South London had an easier commute and many were happy with the relaxed atmosphere of the storage facility. All these moves were done quickly and efficiently by Nexus Ltd (who specialise in moving Museum collections) and to move the many thousands of drawers in their correct order, we used 450 wheeled supermarket style cages with polyethylene foam insert pads cut to fit the three main drawer sizes involved, the 'Hill main' drawer, the 'accession' and the Rothschild & Rhopalocera drawers (20 drawers per cage) (Figs. 8, 9, 10). After initial briefing as to the delicate nature of our specimens within the drawers, the Nexus staff were very professional and efficient in moving the drawers for us under close curatorial supervision. Many lorry loads went to South London from South Kensington with a member of our staff 'riding shotgun' to ensure that the speciems came to no harm en route. In order to load the lorries in the Queens gate car park, we pushed out a window in the Entomology Block basement and put in a small external lift to ease loading drawers and cabinets going out to the South London Store. Only a few accidents occurred, with the potentially catastrophic fall of a fully loaded cage from a lorry tailgate only dislodging two specimens without damage within the 20 full drawers which showed how effective the cage/pad system is!

**New Buildings: The Second Phase of the Darwin Centre**

The move out of the Entomology Block was completed by November 2005 and Heery International Ltd immediately started demolition and, as with the Spirit Building, this was a slow and noisy process, finished by March 2006. The building was well built and had survived a number of near bomb blasts during WW2, so hammer drills had to be used on occasion to dismantle the harder bits. A funding campaign was started in autumn 2004 and phase two of the Darwin Centre plans by Danish architects C.F. Møller were finalised and the main contractor, HBG Construction, was appointed in August 2005, who started construction work in June 2006. The footprint for the second phase building varied slightly from the Entomology Block. It included the workshop courtyard that existed between the Entomology Block and the Spencer Gallery wall of the Waterhouse Building. It is also further back from Queens Gate in line with the west end of the Waterhouse facade, so as to impact less on the view of the 'listed status' Waterhouse Building frontage of the Museum. Also, we could not build above the roof line of the Waterhouse frontage for similar reasons. The second phase building consists of a reinforced concrete and glass faced atrium with an insulated sprayed concrete cocoon, faced with Venetian plaster inside and supported on piled foundations. The west façade glazing and roof are supported on steel columns and beams. The cocoon concrete also acts as part of the structural frame. Flooring includes limestone in the public areas and vinyl in the science areas. Glass fronted offices are at both North and South ends to house up to 250 staff. The cocoon is, at 65-metre-long and eight storeys high (Fig. 11), the largest sprayed concrete structure in Europe. Our first occupant was a red fox (*Vulpes vulpes*) which took up residence for a few days and left of its own accord after attempts were made to 'rescue' it and it now lives somewhere in the Museum's wildlife garden.

Part of the Darwin Centre second phase funding covered the manufacture and fitting out of compactor units and new collections furniture within the cocoon stores. The compactors were made and fitted by Rackline and the cabinet job went to tender. After much discussion with the companies short listed, we decided to

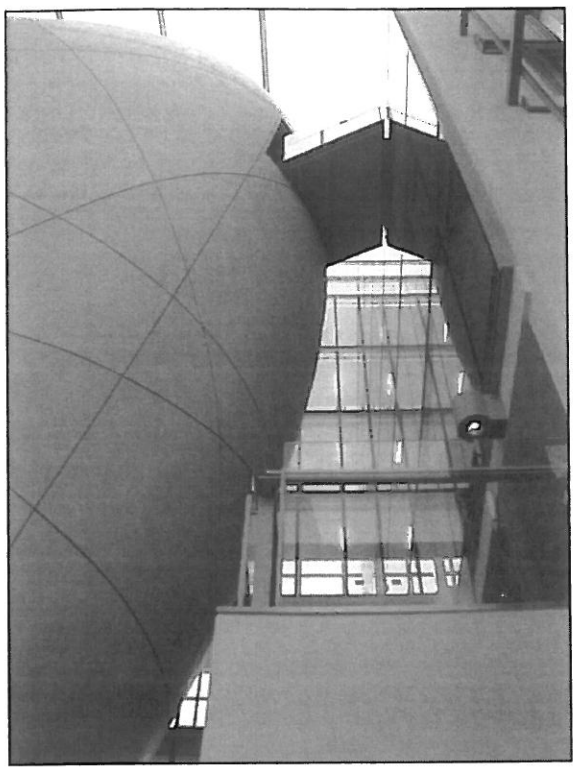

**Fig. 11.** DC2 cocoon looking up from the public atrium.

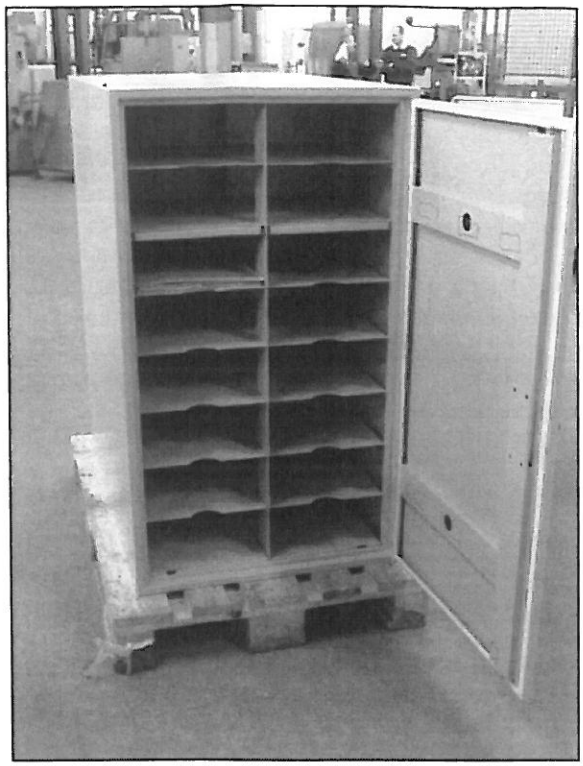

**Fig. 12.** Sheetmetal Ltd Botany cabinet. Photo by C & D.

use C & D Sheet Metals Ltd of Belvedere, Kent who gave us a cheaper, lighter yet stronger double backed design involving the welding of two 'U' shaped steel sections longitudinally. We have three sizes of Entomology cabinets to fit our 'main collection Hill', our 'accession moth box and our Rothschild & Rhophalocera drawers. The Botany cabinets with herbarium sized compartments look on the outside, very similar to our Entomology cabinets (Fig. 12). All the new cabinets were manufactured on computerised metal folding machinery so that the cabinets are the same throughout without the little variations one gets with individually made cabinets. A standard pale grey was chosen as our corporate cabinet colour for both Botany and Entomology collections (Fig. 13). An environmental monitoring system by Eltec was installed throughout DC2, in the cocoon and within cabinets with a controlled relative humidity of 45-55% and a temperature of 17°-18° Centigrade. This system is maintained and monitored by our Conservation Group and the Palaeontology Conservation Unit.

**The Entomology 'Migration'**

On completion of the second phase, we employed Nexus Ltd again to 'migrate' (as opposed to 'decant') the Botany collections for the first and only time and the Entomology collections for a second time (Fig. 14). First to move in were the DNA laboratory into the 6th floor with new lab furniture by Waldner Ltd and our imaging Sackler Biological Imaging laboratory into the 5th floor. The old seal basement has now been developed as the Wolfson Wellcome Biomedical Laboratories.

The decision was made to move the flowering plant collections and staff from Botany into the second phase so that not all the Entomology collections have moved over to the new building. The Coleoptera and Hemiptera pinned collections were left in the Origins Gallery with the Hemiptera: Sternorrhyncha microscope slide collections moving from the South London store facility into the space vacated by the Orthopteroids, Neuropteroids, Trichoptera & Odonata. Entomology has now occupied the 2nd floor with Diptera and Lepidoptera, 3rd floor with Hymenoptera and Lepidoptera again and the Phthiraptera, Thysanoptera and Collembola microscope slides and the 7th floor with Orthopteroids, Neuropteroids, Trichoptera, Odonata etc. Lepidoptera is also stored on the Ground floor and on the Lower ground floor where we also have both the Botany and Entomology British collections.

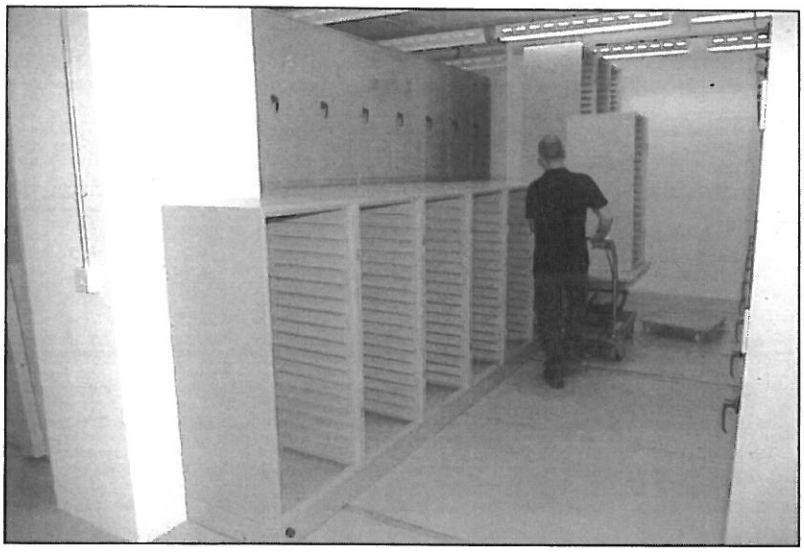

**Fig. 13.** Fitting out the Compactor units with new C & D Sheet metal Ltd insect cabinets in the Cocoon.

We moved the last of the specimens out from the South London Store on Friday 18th December 2009, thus completing the move which Nexus has again done exceedingly well for us. At present, we have left behind the Entomology Library which remains there and we continue to maintain a twice daily hybrid fuelled car shuttle service link with the Library.

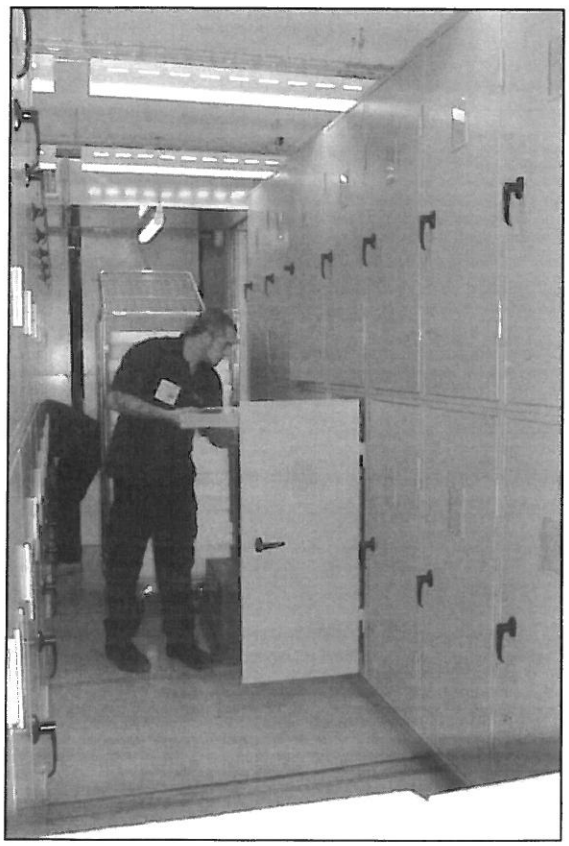

**Fig. 14.** Nexus putting insect collection into the new cabinets in DC2 cocoon.


**Fig. 15.** John Hunnex of Botany Dept removing the last cage of Frozen Botany specimens.

**The Botany 'Migration'**

The Botany general and European herbaria were moved from the 2nd floor west Waterhouse herbarium using smaller sized cages than the Entomology ones, with green corex tray inserts into which the herbarium folders were placed. The full cages were then taken down through the public areas of the Museum to be systematically frozen down to -30°C as part of the move, inside three Maersk 40 ft 'Magnum' freezer containers sited in the Museum's car park (Fig. 16). Maersk donated the freezers free of charge with Darwin Centre funding covering the cost of transport. There was an endemic, if low population of *Stegobium paniceum* beetles within the sheeted herbarium collection so freezing was required to remove the threat to collections in the new building. The Entomology collections were inspected drawer by drawer and any *Anthrenus* / *Reesa* infested drawers, of which there were very few, were frozen separately. These herbarium collections now occupy the Lower Ground, 4th and 5th floors of DC2. The last cage of European Herbarium sheets were moved from the freezer by John Hunnex on 23rd February, 2010 which represented the end of the main 'Migration' into DC2 (Fig. 15).


**Fig. 16.** Maersk 'Magnum' Freezers in situ in the Exhibition Road car park.

**Life in the Darwin Centre**

Entering the Cromwell Road museum entrance and turning left along past the dinosaur gallery, one soon sees the Cocoon ahead and light from the wildlife garden streams into the Waterhouse gallery from the extensive glass front and transparent roof of the new building. When it rains, the sound on the roofs resounds throughout much of the Darwin Centre. In the second phase, we now work in air conditioned, open plan cubicles with modern Godfrey Syrett furniture in a restful grey and blue combination with spaces for visiting researchers and curators (Fig. 17). Most collections work is done on the layout tables at the curved cocoon ends, linked but separate from the main storage areas. Some specimen preparation work, such as mounting microscope slides and field sample sorting is done in small laboratories and there are meeting rooms, two of each on each floor. Access to the working areas and collections stores of the new buildings is restricted to staff only with booking in and monitoring of bona fide visitors, to secure the collections and to keep the environmental controls steady.. One problem we have found within the cocoon, and many of the office areas, is that there is no mobile telephone signal due to the cocoon's 'Faraday cage' nature. There is a spacious common room with an open air veranda on the eighth floor for both front and back of house staff in the Darwin Centre.

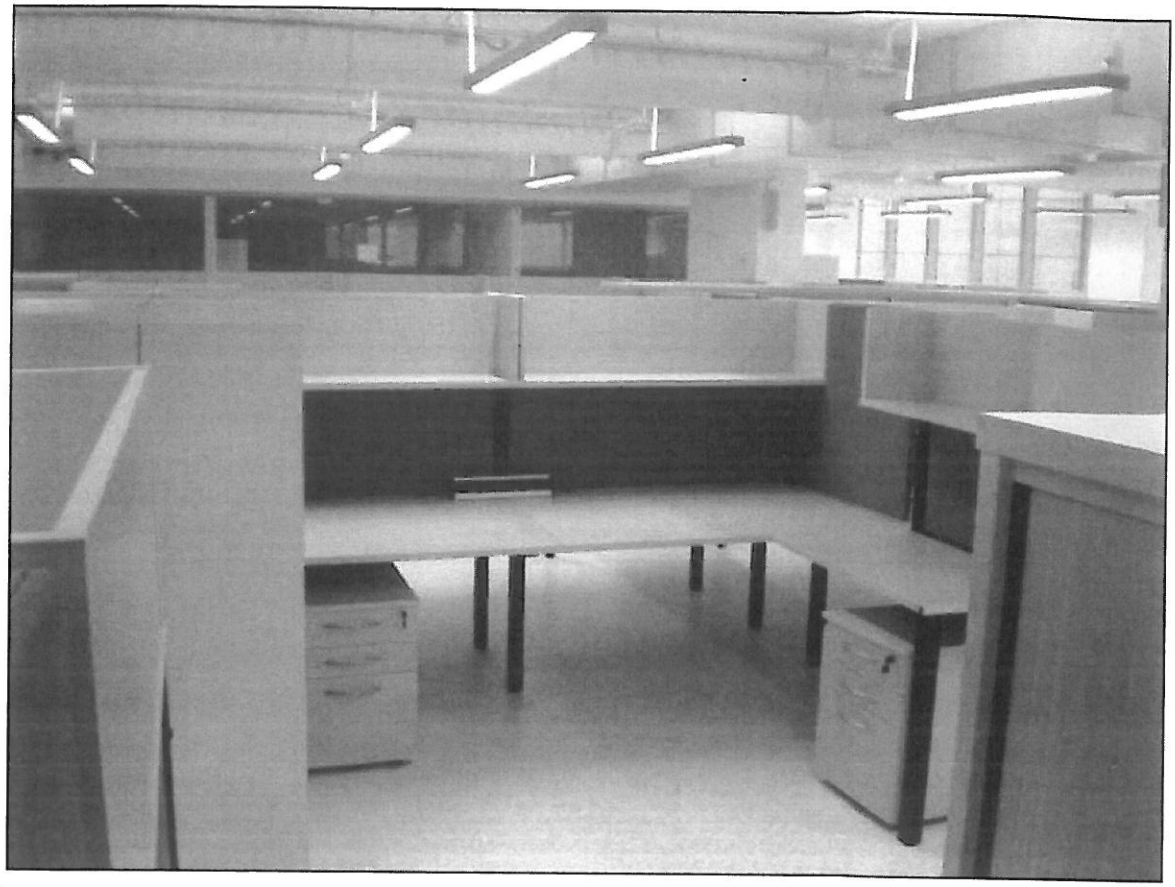

**Fig. 17.** Our new office bays in DC2 North, photo courtesy of Ed Baker.

As part of the public offer and to fulfil the requirements for some of the funders, the building has been designed for public entry and interaction, with a public gallery through the Cocoon. The free self-guided tour starts as you enter the lifts which take you up inside the atrium with panoramic views of the cocoon and the west gardens. The journey then enters the top of the Cocoon where there are displays and video loops (with subtitles); introducing the tour are virtual Museum Curators and Scientists; a view into the historic Botany collections; cracking the DNA code with views into the DNA Laboratories; and field work, which includes videos of Museum expeditions to Panama, The New Forest, Taiwan, Thailand and the Museum's Wildlife Garden. To illustrate the preparation of specimens for our collections and for research, we have our Specimen Preparation Area where we prepare plant specimens and sort insect samples from lacustrine deposits, soil and leaf litter samples and intercept trap catches collected from expeditions. We have fume extraction for spirit work, plant presses, a microscope camera and screen and connection for laptop use so that many different jobs can be done. Here, the public have the chance to speak to Botany preparators and Entomologist Scientists and curators behind a glass panel through an intercom system (Fig. 18). Then there is a view into the Sackler imaging laboratory and final views into the 5$^{th}$ floor Botany cocoon store. With our colleagues in 'Public Engagement', we are improving the design and user friendliness of the Cocoon exhibits. We have a team of visit planners and learning staff who frequent the atrium and Cocoon, who are there to answer questions from and to care for the public. I have lead tours of the cocoon and lab areas for these staff members so that they know what we have behind the scenes and to furnish them with additional facts.

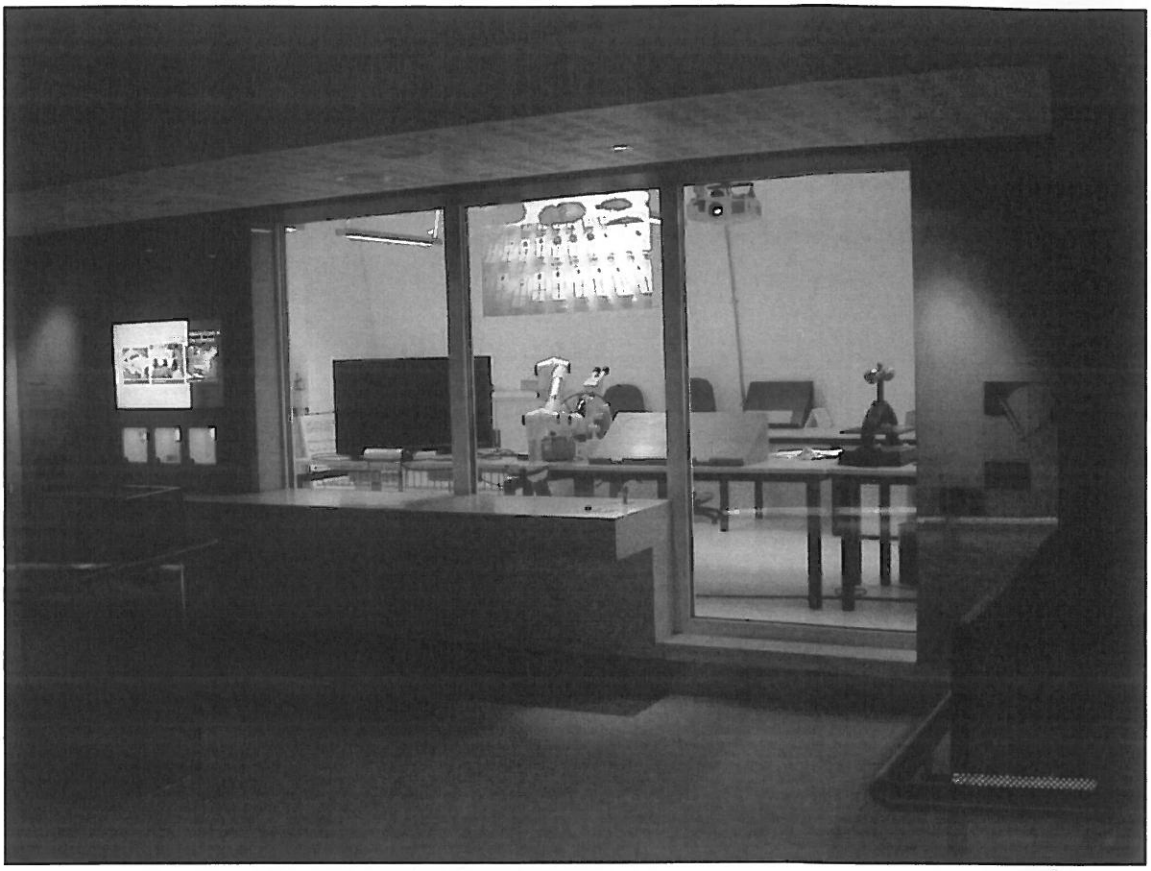

**Fig. 18.** The DC2 Specimen Preparation Area (SPA) where the public can speak to the Scientists and preparators.

**Fig. 19.** Prince William with the NHM Director, Michael Dixon at the DC2 opening ceremony, 14th September

The visitor leaves the Darwin Centre knowing what, why and how we collect, care for and research our collections. Even though called the Darwin Centre, there is strangely no mention of Charles Darwin or the 'Theory of Evolution' in the exhibition content. Off the Ground floor atrium, we also have the state of the art, Attenborough Studio which is the home of the Museum's Nature Live events where staff present their research and curatorial work to the public. Off the Lower Ground floor of the atrium, there is the Angela Marmont Centre for UK Biodiversity. Here we have identification and advisory services, synoptic British collections and the London Natural History Society Library and a suit of facilities for external natural history training courses. There is access out of the second phase across the courtyard, into the wildlife gardens so that course participants can view and catch specimens and bring them into the Angela Marmont Centre for closer study. The second phase allows visitor access again to the first phase ground floor displays of the Zoology spirit collections.

The grand Darwin Centre opening occurred on 14th September 2009 with His Royal Highness Prince William and Sir David Attenborough attending (Fig. 19). If you have not visited us already, why not come and be amazed by our new iconic buildings and book to join the free public tours! If you wish to visit any of the collections area within the cocoon one needs to book an appointment with the relevant Botany and Entomology Collections Managers.

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**Information from:-**

NHM Zoology, Entomology and Botany Departmental annual reports
'Decant Rant' & 'Migration News' NHM circulars.
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# Book Review

## Science Exhibitions: Curation and Design. Editor: Dr Anastasia Filippoupoliti. Pages: 512. Published by MuseumsEtc

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Science exhibitions; Curation and Design is a new book published by MuseumsEtc. Guest edited by Anastasia Filippoupoliti, at the Democritus University of Thrace, Greece, this is the first of two new volumes examining the different ways in which science exhibitions are developed in science institutions around the world. This volume examines in detail the set up and design of a plethora of different science subjects. The second volume focuses on how the exhibitions are communicated to different audiences and how they are evaluated, and is being reviewed for *NatSCA News* Issue 21.

Science exhibitions; Curation and Design is filled with articles about different types, and styles, of exhibitions. Often books, and articles, written about best practices in museums are written by people who may have never worked in a museum before: each chapter in this book, however, is written by the individual or colleagues who work at putting the exhibition together. Real case studies provide new ideas and inspiration when developing our own exhibitions, and this book provides a close look at the processes involved and why certain decisions were made.

The book is divided into five parts, with a selection of essays in each part. Part 1 includes chapters focusing on different methods of 'making science public'. Beginning with an historic look at the science exhibit at the yearly conference held by the American Association of Medicine, which ended in 1986, this chapter illustrates different methods used by doctors showcasing their research. Interesting ideas were used, from live broadcasts of caesarean sections in the 1920s to stands with graphs and 'living demonstrators' using new artificial limbs. The following chapter discusses overcoming the potential challenges of displaying medicine to the public at the Wellcome Trust, London. Open forum discussions were developed where members of the public were invited to to discuss current scientific topics. Lead by different experts, these sessions provided the opportunity for members of the public to hear about, and challenge, some scientific topics than they would otherwise not have been able to.

'Curatorial Challenges' is the second part of this book and illustrates innovative ways of displaying more challenging science topics. Developing an interactive exhibition based on historical science objects relating to physics was one challenged for the Science Museum, London. As well as an informative brief history of science, this chapter shows how a simple grasp of the seemingly complex science of physics can create a successful, interactive, friendly exhibition. The following chapter outlines the process and delivery of an interactive exhibition at the Thackray Museum, Leeds, based on a person and not objects. This was an impressive twist; generally exhibitions are created based on the collections, but this exhibition was created around a person, with no accompanying objects. However, the focus was on Dr Waldon, who studied neurology and child development, and this exhibition successfully incorporated several interactive highlighting the different ways in which people learn. Part 2 of this book reminds us that we can look beyond the specimen, or the person, and develop something that will relate to the general public.

Members of the public may not have prior knowledge about a scientific subject, and the first chapter in Part 3, from Sharon MacDonald, at the University of Manchester, is a an appropriate introduction to this section of the book 'Cutting Edge Research Exhibited'. It is an interesting analysis of what the visitors get out of science exhibitions, and taking this into account when we are developing our own exhibitions. Leading on from this, Sharon Davies, at Arizona State University, discussed the history of

science displays in museums, and how museums are adapting to involve visitors through feedback and interactive. The third chapter in Part 3, specifically looks at an exhibition about nanotechnology in France. This is no easy feat; nanotechnology involves the science of the unseen world and with medical and technological advances, it also opens up debate about ethical and social issues. The exhibition outlines different uses of nanotechnology, and involved the public, allowing feedback from their thoughts on the uses and the future of this micro-world. Finally, Part 3 finishes with a interesting chapter discussing the idea of artists working with scientists to produce exhibitions creating a human touch on the science.

Part 4 is dedicated to 'Art and Science' projects, outlining successful projects using science to create inspiring art; and understanding the science behind the art. The first chapter outlines an exhibition which was built upon from a concept of observing the dendritic form of a horse chestnut tree. The endless ideas, from hydrological graphs, to the fragile, intricately delicate glass reconstruction of the inside of a human lung, were just a few examples of many imaginative art instillations produced for this exhibition; all from a chance and fruitful observation from a window. Detailed, yet simple, line drawings were the focus of the next chapter. Scientists and members of the public used pencil and paper to draw from the Royal College of Surgeons, Huntarian Museum collections, which allowed the collections to be looked at in much more detail than ever before. Finally Part 4 concludes with a large scale art work on the American Prairies. Giant images of the endangered American Bison, the Gray Wolf, and the Bald Eagle, were etched out from the great prairie landscape. This chapter opens up new ways of looking at collections and shows how specimens can be interpreted in different ways; often it demonstrates that we can see new things with our collections that have never been seen before.

The final section of the book, Part 5, focuses on 'Design Outlooks', and includes several case studies of good practice methods for science institutions. It begins with a chapter discussing the importance of graphic design in science exhibitions to convey the scientific information in the most clear and informative way to the public. The following chapter describes a new and interesting method of creating an exhibition, at the Liberty Science Centre, USA. This exhibition takes 'public consultation' to a new level, by creating a social network from the very beginning of the exhibition set up, the public literally had an input into what they wanted to see in the exhibition. It may appear like a lot of work, but the idea was very interesting, and had some great outcomes. Nanotechnology was the focus of the next chapter, outlining what worked well and what didn't work in this design. Storytelling was the theme of the penultimate chapter, discussing an interestingly different way of developing a science exhibition. The final chapter researched how maritime museums can, and have, played a role in science displays. This section of the book highlights a variety of different methods for creating science exhibitions; it also reminds us that we can be adventurous in developing exhibitions in our own museums.

Science exhibitions; Curation and Design is an interesting book. It can be compared to a text book, with numerous detailed case studies from science institutions around the world. Each author has included detailed background information behind their topic, and behind the process of the exhibition development. Importantly, the authors include information about what worked well and what didn't. It was interesting to read about how some case studies showed that sometimes the old ideas work perfectly well. Other chapters reminds us that there is nothing wrong with having a new and innovative method for developing an exhibition; sometimes they may be slow to take off, but there are many ways to interact with the public. I found the variety of chapters useful, and made me think more about developing future exhibitions. In particular, I hadn't thought about doing a display on nanotechnology due to the subject matter, but I will go back to the examples in this book.

We often develop exhibitions with such enthusiasm for the topic we know and love so well. This book reminds us to take a small step back and thing of new, and sometimes old, ways in which we can get the best out of our topic for the public.

Science exhibitions; Curation and Design is available from www.museumsetc.com, or contact service@museumsetc.com.

Jan Freedman. 9th December 2010.

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