Index

Editorial

The NatSCA Glasgow AGM 2008, was full of fantastic and innovative ways of museums working with different organisations. From working with the RSPB, to large museums working together to assist in secondary school science, in theory, the partnerships are unlimited.

One partnership I am not sure was acknowledged as much was that of the host partners; the Huntarian Museum, University of Glasgow and Kelvingrove Museum. They worked together, effortlessly, to ensure the conference ran smoothly; one day at the Huntarian and the second at Kelvingrove. Large museums working with smaller ones not only builds strong relationships, but assists the smaller museums by offering expertise that may otherwise not be there. (See 'Note from the Chair')

Partnership work and support from other museums can also assist museums with collections at risk. Contact NatSCA if you have any concerns.

On behalf of the whole committee, welcome to the new committee members, who will bring new ideas and thoughts to the committee. And thank you to those who have left, for their hard work!

- Jan Freedman

Peer Reviewed Journal for NatSCA?

I am hoping to find out about producing a peer reviewed journal for NatSCA, which would be a formal journal with peer reviewed publications from the Natural Science Collections Association members.

If any one has any thoughts, positive or negative about the idea of a peer reviewed journal, please contact me.

Or if any one has any suggestions, or advice, please contact me!

Jan Freedman (jan.freedman@plymouth.gov.uk)

Contributions for Issue 16, October 2008

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 October 1st 2008:

Jan Freedman [Editor, NatSCA]
Assistant Keeper of Natural History, Plymouth City Museum and Art Gallery, Drakes Circus, Plymouth, PL4 8AJ

email: jan.freedman@plymouth.gov.uk

View From The Chair

As your new Chair, can I pass to you my best wishes and greetings to all our membership.

I attended a meeting of representatives of the Subject Specialist Networks with MLA (Museums, Libraries & Archives council) where we were informed about their recent restructuring which has meant very little has happened over SSNs on the MLA side of operations. There are now many SSNs both old established groups and small new ones now in existence and in operation.

Helen Fothergill, now chair of the Geological Curators' Group, was also present and we had some very useful discussions as to what we might do together. We are also keen to develop good & proper working relations with the other groups concerned with natural science collections and conservation.

MLA asked the SSN representatives what we really wanted from them and comments from myself from our membership survey and from Helen included: not so much "help & training" from them but money for paying a part-time staff member to organise and administrate our training, seminars, events, bursaries, peripatetic curator / conservator help etc etc. We hope that the "Natural Sciences SSN" will not be dictated to by the MLA as respective groups already exist and operate extremely well as a network.

The MLA are offering support and an information gateway via The Collections Trust Collections Link website @:-
http://www.collectionslink.org.uk/find_a_network/subject_specialists.
We plan to link our website, along with GCG, to theirs as the "www.naturalscience. specialistnetwork.org.uk", thus maintaining a presence alongside other MLA-supported SSNs. An example exists at: http://www.portraits.specialistnetwork.org.uk/.

The next step will be to establish a SSN steering group comprised, where possible, of the following (practicing natural science) members: single reps from NatSCA, GCG, the 9 Regional Hubs in England, Wales, Scotland, NI, University Museums & the National museums (NHM, NML, NMGW, NMS). Maybe also with the Guild of taxidermists, Care of Collections Forum, Institute of Conservation, ICOM Natural History Collections Working Group etc.

The first suggested activity for the NS-SSN (based on the output from the regional meetings with natural science museum staff) is to create a fund to support peripatetic work. It is hoped that MLA will continue to support such work with funding, depending on how much money can be made available.

Peripatetic work divides comfortably into 3 categories:
Curator: Assistance with collections management/care/ identification/ understanding collection held
Conservator Assistance with collections care/conservation (remedial & preventive) / risks to collection/ risks to staff in contact with collections.
Other "expert" (External Consultant) Assistance with identification / understanding significance of smaller collection elements.
Any individual project must be able to demonstrate direct value to the collections/host institution regardless of value to the person carrying out the work. (Pure collections mapping exercises will not be funded.)

Following the creation of a steering group, it is expected that the fund will be available for applications and a formal application procedure will be developed and promoted. The steering group will judge such applications on their own merits.

For more details relating to the background of the NS-SSN please visit our website at http://www.nhm.ac.uk/hosted_sites/natSCA and GCG's at: http://www.geocurator.org

Watch this space for any future developments!

- Paul A Brown, Chair NatSCA, 28.vii.2008 written in collaboration with Helen Fothergill, Chair GCG.

Glass Eyes and Turning Down the Heat: A note to the NatSCA Anoxia Seminar, January 2008.

An article in Issue 14 of NatSCA news had a sentence which appears to have panicked a few people;

> "Advantages of anoxia over freezing are that some materials can de-nature during the freezing process - such as very old glass eyes splitting, etc. This does not happen in an anoxic environment."
>
> Anoxia Seminar write up. Issue 14. pg. 8 - 12

However, this is not a 'hard-and-fast' rule that glass eyes will split. If infested specimens are bagged and frozen in the normal way, this will greatly reduce the likelihood of split eyes. This type of damage generally occurs over prolonged periods of freezing (over 3 months). Importantly, glass eyes can be replaced if on an extremely rare occasion, splitting occurred, whereas specimens cannot.

Bagging for freezing, reduces ice crystal build-up inside the specimens. However, I have heard from one person who doesn't use bags when freezing and they have seen no effect. It would be interesting to hear people different experiences - what works and what doesn't work. Send articles to jan.freedman@plymouth.gov.uk.

There are articles out there about freezing, which may be helpful;

Raphael, T, 1994. An Insect Pest Control Procedure: The freezing process. *Conserve O Gram.* Number 3/6. pg. 1-4.

Kingsley, H. (Ed), 2001. *Integrated pest management for collections.* Manley.

Berkouwer, M. 1994. Freezing to eradicate insect pests in textiles at Brodsworth Hall. *The Conserv*ator. No. 18.

Hillyer, L., and Blyth, V. 1992. Carpet Beetle - A pilot study in detection and control. *The Conservator.* No. 16.

NatSCA Conference and AGM 2008 Minutes.

University of Glasgow, Hunterian Museum Zoology Section, Graham Kerr Building Lecture Theatre

Thursday 15th May, 2008, 1.45 - 2.30 pm

1. **APOLOGIES FOR ABSENCE** were received from Vicki Papworth, Nick Stafford, Helen Fothergill, Steve Thompson & Simon Moore. Paul Brown acted as Chair in Vicki's absence.

2. **MINUTES OF AGM SHEFFIELD** 2007 were signed by the chair as a correct record of the meeting.

3. **MATTERS ARISING FROM SHEFFIELD AGM MINUTES.** There were no matters arising.

4. CHAIRMAN'S REPORT

Paul Brown read out a message from Vicki Papworth, the retiring chair:
Farewell From The Chair

Dear Members,
It's been a busy year for NatSCA - considering our role in the Subject Specialist Networks, considering a potential grant for increasing public access to and involvement with the UK's natural science collections, and as usual, our conference and two successful workshops, on anoxia, held at the NHM, London late last year and on **Collection Conservation Assessment on** 4th April at Leeds Discovery Centre.

I am leaving the Botany Department of the Natural History Museum after nearly 10 years as a volunteer, temporary and permanent member of staff. As I am moving (perhaps only temporarily) out of science and out of the museum sector I did not think it appropriate to carry on as Chair of NatSCA. I have been approached by the private sector and will be joining *the Development Trust Association*, managing a team of 45 consultants who help communities to manage their business assets, as well as lobbying local and central Government.

I'm afraid I won't be able to make the conference this year, which I really regret as it has a set of interesting papers which will be of use to all of us. We have a really good committee at present, some new faces as well as some long-serving friends, and they will be contacting you soon to let you know who will be taking over.

I would like to say a big thank you to you all - I've really enjoyed working with many of you over the years as well as being part of the team that helped move the BCG and NSGC into the new group that is NatSCA. I think we've really breathed some new life into our programme of events as well as doing some hard thinking about what we want to do and where we want to be, and I've found it inspiring to be a part of that.

Very best wishes, Vicki Papworth

Paul Brown added the following
We hope to further develop our relationship with GCG and I am in discussion with Helen Fothergill over closer collaboration over SSN status, seminars and other related topics. Likewise, through our contact Clare Valentine, we will continue our relationship with SPNHC (Society for the Protection of Natural History Collections) in North America who are holding there annual conference on **Collection Stewardship: Challenges in a Changing World**, in **Oklahoma City** this week. They plan to hold a meeting in Leiden in The Netherlands the week of July 6-11, 2009, next year. We are also now an associate member of the National Biodiversity Network and will have a say in what is planned for national recording including any future for FENSCOR.

Part of our remit is to approach museums' governing bodies if there is a perceived problem with the future of a natural sciences collection or if there are cuts in suitable staffing levels for the care of such collections. We need to know if a collection is at risk, such as at Kendal and the staffing levels at Bristol Museum. In order to make a considered and well balanced approach to a governing body, we must be furnished with objective facts to build our case for defence. If you have a problem then do let us know!

5. SECRETARY'S REPORT: Paul Brown

Attendance NatSCA committee 2007-2008.

	16.viii.07 NHM	12.xi.07 Winchester	4.ii.08 Leeds	14.v.08 Glasgow
Kate Andrew	**X**		**X**	**X**
Jack Ashby	**X**	**X**	**X**	**X**
Paul Brown	**X**	**X**		**X**
Andrea Hallaway	**X**			
Tony Irwin	**X**	**X**	**X**	**X**
Miranda Lowe	**X**	**X**		**X**
Jane Mee	**X**		**X**	
Nicola McNicholas			**X**	**X**
Simon Moore		**X**		
Vicki Papworth	**X**	**X**	**X**	
Maggie Reilly	**X**		**X**	**X**
Douglas Russell				
Clare Stringer		**X**	**X**	**X**
Steve Thompson	**X**	**X**		

6. TREASURER'S REPORT: Kate Andrew

Natsca Accounts 1st February 2007 – 21st January 2008:

Natural Sciences Collections Asso-ciation Natural Sciences Collections Asso-ciation	**No 1098156**	**CC16a**

Receipts and payments accounts

For the period from	Period start date 01-Feb-07	**To**	Period end date 31-Jan-08

Section A Receipts and payments

	Unre-stricted funds to the nearest £	**Re-stricted funds to the nearest £**	**Endow-ment funds to the nearest £**	**Total funds to the nearest £**	**Last year to the nearest £**
A1 Receipts					
Subscriptions	**4,513**	**-**	**-**	**4,513**	**4,386**
Sale of back issues	**53**	**-**	**-**	**53**	
Conference and training	**5,585**	**-**	**-**	**5,585**	**5,020**
Grants/ awards from other bodies	**-**	**-**	**-**	**-**	**4,300**
Bank interest	**-**	**556**	**-**	**556**	**404**

Balancing sum from previous year	**4**	**-**	**-**	**4**	**-**
	-	**-**	**-**	**-**	**-**
	-	**-**	**-**	**-**	**-**
Sub total	**10,155**	**556**	**-**	**10,711**	**14,110**
A2 Asset and investment sales, etc.	**-**	**-**	**-**	**-**	**-**
Total receipts	**10,155**	**556**	**-**	**10,711**	**14,110**
A3 Payments					
Subsciptions	**75**	**-**	**-**	**75**	**35**
Insurance	**849**	**-**	**-**	**849**	**795**
Newsletter printing & postage	**2,069**	**-**	**-**	**2,069**	**3,522**
Committee travel expenses	**1,311**	**-**	**-**	**1,311**	**665**
Marketing & promotion	**51**	**-**	**-**	**51**	**67**
Operational expenses (postage, photocopying)	**67**	**-**	**-**	**67**	**191**
Conference and training course expenses	**3,730**	**-**	**-**	**3,730**	**4,992**
Bank charges	**10**	**-**	**-**	**10**	**10**
Bursaries	**348**	**-**	**-**	**348**	**1,009**
Web site	**50**	**-**	**-**	**50**	**150**
Sub total	**8,559**	**-**	**-**	**8,559**	**11,436**
A4 Asset and investment purchases, etc.	**-**	**-**	**-**	**-**	**-**
Total payments	**8,559**	**-**	**-**	**8,559**	**11,435**
Net of receipts/(payments)	**1,596**	**556**	**-**	**2,152**	**2,271**
A5 Transfers between funds			**-**	**-**	**1,500**
A6 Cash funds last year end	**4,652**	**22,484**	**-**	**27,136**	**730**
Cash funds this year end	**6,248**	**23,040**	**-**	**29,288**	**4,501**

Section B Statement of assets and liabilities at the end of the period

Categories	Details	Unrestricted funds to nearest £	Restricted funds to nearest £	Endowment funds to nearest £
B1 Cash funds	Bank accounts	**6,259**	**23,040**	**-**
	Uncleared cheques from 06/07	**-155**		
	Uncleared cheques 07/08	**146**	**-**	**-**
	Accounting error		**-**	**-**
	Total cash funds	**6,250**	**23,040**	**-**

	Details	to nearest £	to nearest £	to nearest £
B2 Other monetary assets		**-**		**-**

	Details	Fund to which asset belongs	Cost (optional)	Current value (optional)
B3 Investment assets			**-**	**-**

	Details	Fund to which asset belongs	Cost (optional)	Current value (optional)
B4 Assets retained for the charity's own use			**-**	**-**

	Details	Fund to which liability relates	Amount due (optional)	When due (optional)
B5 Liabilities				

Signed by one or two trustees on behalf of all the trustees	Signature	Print Name	Date of approval
		K.J. Andrew	Apr-08

It is with great pleasure that I present the final set of annual accounts in my role as retiring Treasurer of NatSCA. I have been involved with the group and its pre-cursor bodies since the very first meeting held at the International Symposium and First World Congress on the Preservation and Conservation of Natural History Collections in Madrid in May 1992. I've been Treasurer for fourteen of those years and Chair for two years, but I will be staying on committee as an ordinary member for another term of office.

The organisation is in good heart and has substantial reserves, some inherited from BCG, some as a result of our own careful management over the years. We do need sufficient reserves in hand to operate for a year and with diminishing museum budgets, we are now having to cover most committee members travel expenses to meetings. However, this still leaves enough to extend our bursary provision further, the possibility of supporting other small projects and we are looking into a project that will require a substantial amount of match funding.

I was delighted that Tony Irwin agreed to take over at last year's AGM and have enjoyed working with him over a handover period. Tony took on the role in full from the start of our financial year and has also helped to check this year's accounts (out by £2 despite extensive cross checks) .

A big thank you too, to Velson Horie, our independent examiner for checking and approving the accounts as a true representation of our activity.

The accounts were presented by the treasurer and accepted by AGM as proposed by David Lampard and seconded by Kathie Way.

7. MEMBERSHIP SECRETARY'S REPORT: Maggie Reilly

We ended the year with 237 paid up members of which 58 were institutional, 179 are personal. 2 of the personal members are students. We had 26 members who did not renew but this was amply compensated for by the 36 new or returning members we gained in the year. We have had some glitches with standing orders but this is generally working out satisfactorily. Standing order forms are available on the website and we would encourage members to use them. Our membership remains predominantly UK based with 23 overseas (EU and else) members. We continue to mail the Newsletters to 11 free-of-charge recipients. In the course of the year we have tried to get current email addresses for all members who have them. Institutional memberships quite often do not have a named staff member but a role i.e. Museum Curator or Librarian as contact. We have had quite a good response to the request for email addresses. We do still mail out a hard copy of important info on seminars/events to non email members.

Additional note:
After Vicki Papworth's departure as our webmaster and holder of the email distribution list, new arrangements are in place. Maggie Reilly now has the email distribution list so any requests for circulation of emails should be sent to her at mreilly@museum.gla.ac.uk. In order to keep the website running and up to date, Paul Brown has sourced a Natural History Museum volunteer, Ed Baker who can do the work for a modest fee. All updates to be sent Paul in the first instance at P.Brown@nhm.ac.uk.

8. EDITOR'S REPORT

NatSCA News continues but we apologise for the printers sending out the wrong issue, the contents of issue 8 reappearing instead of the contents of the real issue 13, unlucky for us, but the printers took responsibility and reissued the correct one. I'd like to welcome Jan Freedman as our new acting Editor although he was voted into place later during the AGM. He took over and produced issue 14, and so please, send your papers and various submissions to him at Plymouth City Museum. If you know of any meetings that are going on in your area or are aware of new staff being appointed, or positions being left empty, then let us know and we can publicise appropriately on our website and in NatSCA News.

Web site

Vicki was our Webpage person and on her leaving we have employed a webmaster in Ed Baker who is presently a volunteer at the NHM and who is very proficient in web managing. We have completed putting up copy of all 20 NSCG Newsletters & agents of deterioration, all 23 issues of *The Biology Curator* and issues 1-12 of *NatSCA News*. Future additions will be BCG newsletters pre *The Biology Curator* and the single volume of *The Journal of Biological Curation*. We will update the news site very regularly from now on.

Please note that our website is at http://www.nhm.ac.uk/hosted_sites/natSCA/, hosted by the Natural History Museum and not at natsca.org at present

9. NATURAL SCIENCE CONSERVATION REPORT

Simon Moore has sent his apologies. The chair stated that we continue to keep our relationship with the Institute of Conservation (ICON) and the International Council of Museums Natural History Collections Working group (ICOM), that we are planning more NatSCA seminars on Natural Sciences conservation subjects and that we are producing leaflets on Geology and Biology & Botany Conservation in conjunction with ICON.

10. ELECTION TO COMMITTEE

Election of Officers & ordinary members of NatSCA committee :

Retiring from committee are Vicki Papworth (Chair), Andrea Hallaway, Doug Russell, Steve Thompson

(and Kate Andrew as acting Treasurer).

Below are the nominees for NatSCA committee posts to serve from 2008 to 2010/11, which have reached the Secretary. Maggie Reilly has checked to see that those proposed, those proposing and those seconding are all paid up members of NatSCA.

1. Chair 2008-11 Paul Brown NHM, London
Proposed: **Helen Fothergill** Seconded: **Maggie Reilly**

2. Secretary 2008-11 Clare Stringer Leeds Museums
Proposed: **Pip Strang** Seconded**: Paul A Brown**

3. Editor 2008-10 Jan Freedman Plymouth Museum
Proposed**: Vicki Papworth** Seconded: **Paul A Brown**

4. Membership Secretary 08-10 Maggie Reilly Hunterian Museum, Glasgow
Proposed: **Geoff Hancock** Seconded: **Paul A Brown**

5. Conservation & ICON Rep 08-10 Simon Moore Hampshire Museums
Proposed: **Paul A Brown** Seconded**: Maggie Reilly**

6. OM 2008-10 **Nicola Newton (nee McNicholas)** Hancock Museum, Newcastle
Proposed: **Paddy Cottam** Seconded: **Steve McLean**

7. OM 2008-10 **Hannah Paddon** Bournemouth University
Proposed: **Vicki Papworth** Seconded: **Maggie Reilly**

8. OM 2008-10 **Gerry McGowan** Cliffe Castle Museum, Keithley
Proposed: **Clare Stringer** Seconded: **Pip Strang**

9. OM 2008-10 **Jeanne Robinson** Kelvingrove, Glasgow
Proposed: **Maggie Reilly** Seconded: **Geoff Hancock**

10. OM 2008-10 **Kate Andrew** Herefordshire Museums
Proposed: **Maggie Reilly** Seconded: **Paul A Brown**

As there are vacant posts and candidates to fill them, no election is required. There were no objections to the proposed candidates, so the motion was proposed that we accept and elect the listed people en block onto committee to serve for three years for Chair & Secretary and two years for ordinary committee members. Proposed by Nigel Monaghan & Seconded by Jack Ashby.

Still In Post:-

11.	Treasurer	Tony Irwin 2007-10	Norwich Museum
12	OM	Jane Mee 2007-09	Portsmouth Museum
13.	OM	Jack Ashby 2007-09	Grant Museum, London
14.	OM	Miranda Lowe 2007-09	NHM, London
15.	OM	Peter Stafford 2007-09	NHM London
16.	OM	Pippa Strang 2007-09	Yorkshire Museum

11. SEMINARS

We are holding our next seminar on October 8th 2008 on adhesives at the NHM, London. We will be planning further seminars/work shops on Paper conservation relating to labels and the use of Japanese Tissues, Osteology, Geology, Taxidermy, Freeze drying, Ethics, Looking after your archives etc. You can find a list of potential seminars on the website under the 'seminars and workshops' tab at the top of the page. If anyone has a wish list or a need for a particular type of training then let the committee know and we will do our best to arrange it.

12. STUDY TRIPS
We have not yet organised a field study trip abroad as yet but watch out for details on the website. We may visit Leiden during the SPNHC conference next year

13. ANY OTHER BUSINESS None forthcoming

14. DATE AND VENUE OF NEXT MEETING.
Date, venue and subject matter for our next conference and AGM has not yet been finalised. We might share with SPNHC in Leiden as a possibility? If you are keen to host our conference at your Museum then please let committee know.

15. VOTE OF THANKS
The chair thanked the hard work that has been done over the years by Kate Andrew who stepped down from Treasurer post (she has been NSCG chair and treasurer and NatSCA treasurer for the last 17 years but who has decided to help out as an ordinary member in the near future). Also Steve Thompson is leaving the Museum sector and has resigned from Committee after serving as Secretary of BCG & on NSCG committees as GCG coordinator and NatSCA for at least a similar period. Douglas Russell and Andrea Hallaway have also stood down from committee this year.

Also thanked were Maggie Reilly of the Hunterian Museum, Jeanne Robinson of Kelvingrove and all their helpers:- Richard Sutcliffe, Geoff Hancock, John Faithful, Mike Rutherford, Alastair Gunning & Julie Gardham, for all their hard work in planning this conference, for approaching speakers and organising the accommodation and trouble shooting. AGM showed appreciation in the time honoured manner!

16. CLOSE

Tax Relief on Subscriptions

The Natural Science Collections Association is now an approved organisation and is on the Inland Revenue list – see http://www.hmrc.gov.uk/list3/n.htm
This means that if you are a UK Income Tax payer, and belonging to NatSCA is relevant to your job, you can claim your subscription as an allowance and get tax relief.

Some of you may have been claiming tax relief already – BCG used to be an approved organisation. If you have already been claiming relief, it may be best to quietly continue as you are, but if you are not yet claiming, you can do so now. As far as I am aware you cannot claim retrospective tax relief on previously paid subscriptions – particularly as NatSCA has only been an Approved Organisation from this year.

I'm not a financial advisor (far from it!) but feel free to get in touch if you want any guidance on this subject (I have been reading quite a lot about it recently).

Tony Irwin (tony.irwin@norfolk.gov.uk)

Papers from the Conference

Glasgow 15th and 16th May 2008

"WORKING IT OUT—COLLECTIONS AND PARTNERSHIPS"

Renaissance for sciences in the North East? Regional Hubs and the rise of the Great North Museum.

Alec Coles, Director, Tyne and Wear Museums.

At the recent NatSCA meeting in Glasgow, I was asked to talk about the health of Museum Natural Sciences in North East England and also about the Great North Museum; two subjects that are inextricably linked.

North East England is a small region, in terms of both area and population. It has a correspondingly small number of natural science collections and associated specialists.

Changing Landscapes

It is some 16 years since I ceased being a specialist natural science curator; 8 years since I left the Hancock Museum. As a former committee member of Biology Curators Group, the NatSCA conference served to renew old acquaintances from those times. In many ways, it might have been like 'coming home' – but it was not, because the museum landscape is so different from that which I inhabited as a natural science curator: so what has changed?

Over this period there have been some great leaps forward, not least through two major initiatives which have impacted significantly on the 'museum ecology' of the North East (indeed, of the whole country). These are the advent of the Heritage Lottery Fund and, in England, the Renaissance in the Regions programme. Through both, the natural sciences have enjoyed a belated injection of both resources and interest.

The Heritage Lottery Fund has been largely responsible for an unprecedented refurbishment programme in The UK's museums. All around the nation, we have seen spectacular improvements to museums – none more so than Glasgow. In many ways, of course, museums were 'first out of the blocks', to use an Olympic metaphor: just as well, given what is happening now.

It is true that in the early days of HLF, museum natural sciences projects found little favour; thankfully, times have changed. All those years ago, as I cleaned out the aquaria in Sunderland Museum's dated wildlife gallery, I could barely have imagined that Sunderland Museum and Winter Gardens would not only be transformed, but that it would also become an exemplar in terms of demonstrating what can be achieved with HLF funding.

The English Renaissance, 2000

HLF really got going in 1996: four years later came one of the most significant reports in the recent history of England's regional museums: Renaissance in the Regions. The ensuing Renaissance programme, as it is now called, although never funded at the expected level, has provided millions of pounds of additional revenue to museums in England through a range of initiatives.

The major area of investment has, of course, been through the regional museums Hubs, but the total funding for Renaissance has been greater than this. The non-Hub spending has been split between programmes delivered through the, soon to be wound-up, regional agencies, predominantly to support learning and educational work, and the national Museums Libraries and Archives Council to support work such as the Subject Specialist Networks and the Diversify positive action traineeship programme.

Obviously, the creation of regional hubs has not been without its critics: the concept of Hubs and Hub-nots was invented, however, there has been a long-standing, some would say wilful, misunderstanding about the

purpose of Renaissance – many saw it as a Government Handout to support ailing museums: it was of course never anything of the sort. Despite this, i am proud to say that the North East Hub has worked with every registered museum in the region.

Natural Science Collections in North East England

The North East Regional Museums Hub comprises Tyne & Wear Museums, as Lead Partner, with the other Hub Partners being Beamish, the Bowes Museum and Hartlepool. This is significant in several ways: Firstly, in having TWM as the lead, 12 museums and galleries are already bound into the Hub: adding the partners, gives a total of 16, i.e. 20% of the 80 registered museums in the whole of the North East Region. In this respect, the North East Regional Museums Hub can claim to more representative of its constituency and its users than any other region purely on the basis of mathematics.

Secondly, although all the Hub partners have some natural science material, only TWM and Hartlepool have significant natural science collections, and only TWM, specialist Natural Science Staff. Even if you then add in significant collections elsewhere in the region, with the exception of Middlesbrough Museums, collection are mainly small and often ephemeral.

Thirdly, there has, historically, been limited investment in natural science collections per *se* in the region (although, of course there has been some a part of large museum schemes); furthermore, there has previously been little recognition by destination marketers, of the role of museums in the social and cultural regeneration of the region. You will have seen plenty of promotion of the major arts schemes in the area: the Baltic Centre for Contemporary Art; SageGateshead; mima etc.. You will see less about, for instance, Discovery Museum – our headquarters building that attracts more visits annually than Baltic; or the Hancock Museum, which has higher recognition on the streets of Newcastle than any of the other museums or galleries.

Early on in the development of the Hub we wanted to foreground collection care, so we created **curatorial needs projects** which considered collections knowledge. Because we had a very few large collections, but many distributed small and ephemeral collections, we took a region-wide approach. The programme included surveys of mollusc collections, herbaria and other botanical material, and natural history collection audits of specific museums.

The Great North Museum

Perhaps the Great North Museum is the main antidote to the lack of regional investment in the natural sciences and recognition of the potential of natural science collections and museums? This project sees the redevelopment of the Hancock Museum and its amalgamation with two other museum collections: Newcastle University's Museum of Antiquities and the Shefton Museum. It is a complex project, the result of a partnership between Newcastle University, Newcastle City Council, the Natural History Society of Northumbria, the Society of Antiquaries of Newcastle upon Tyne and Tyne & Wear Museums.

The project has a value of over £26 million and the Museum will open in early 2009. The new museum will feature the designated natural sciences and the world cultures collections of the Hancock, as well as the extremely significant archaeology collections of the Museum of Antiquities which include the most extensive collection of artefacts associated with the Hadrian's Wall World Heritage Site anywhere in the World, as well as a unique collection of prehistoric rock art from northern England. The Shefton Museum has a small, but extremely important collection of Greek and Etruscan material.

As part of the arrangements for managing the new Museum, Tyne & Wear Museums will also take on management of the University's Hatton Gallery.

The new Museum will foreground the Hancock's natural science collections in galleries featuring world biodiversity, wild Northumbria, geological history and North Pennine mineral treasures. There will also be a major gallery about Hadrian's Wall, its history and landscape, featuring a wonderful new interactive model of the Wall.

Then Hancock's ethnographic and archaeology collections will be augmented with loans to consider world cultures as well as life and death in Ancient Egypt: the Shefton collections will provide the basis for a gallery about Ancient Greece.

There will be an interactive 'discovery centre', enhanced public facilities and three things that the old Hancock never had: a comfortable (!) lecture theatre, a well-designed education suite and a dedicated temporary exhibitions space.

The project has been generously funded by, amongst others, the Heritage Lottery Fund, the European Regional Development Fund, One North East's Single Programme, the Tyne & Wear Sub-regional Partnership and the Northern Rock Foundation. Seed funding has been provided by Newcastle University and Newcastle City Council.

Explore Your Environment (EYE)
Concurrently, thanks to funding from Heritage Lottery Fund and Northumbrian Water, we have reinvigorated a moribund environmental database to create a truly interactive public participation project. The EYE website (http://www.eyeproject.org.uk/) uses wiki technology, combined with interactive Ordnance Survey mapping and Google Earth to allow the remote entry of environmental data by anyone who registers with the site.

In addition, a major programme of environmental education events has been developed to stimulate interest in the project. This is a powerful partnership with Newcastle University, Natural England and Northumberland Wildlife Trust.

The EYE project and its development are inextricably linked with the ethos and development of the Great North Museum.

The Future...
I still believe that museum natural sciences face serious challenges both now and in the future. There is a dearth of new natural science curators and conservators being either trained or employed. There are relatively few natural science displays being developed and there is a real danger of our sector losing interest in the natural sciences, which is ironic given the ever-increasing public interest in the natural world as demonstrated by the popularity of media-based natural sciences experiences such as Springwatch.

Meanwhile, museum-based environmental recording is hardly thriving as budgets for such activity diminish and the hard truth about impossible financial models dawns.

It is in this context that projects like the Great North Museum, the EYE project and the Hub's curatorial needs work in the natural sciences become so significant. Of course, they address long-standing issues of collections management, building fatigue and under-used databases. More significantly, however, they will create superb new visitor experiences, encourage public engagement, provide research linkages with higher education, and will contribute to environmental understanding, health and sustainability.

So, in what are undeniably difficult times for the natural sciences in English museums, we can point to unprecedented investment in this area in North East England. This investment has been secured on the basis of the heritage merit and research potential of the collections, on the degree of public participation planned, and on a demonstrable contribution to the regional tourism economy.

Huge investment; demonstrable public support and enthusiasm; identifiable research potential; recognition of the social, economic and environmental value of our collections: perhaps the future for the natural sciences in our museums is brighter than we thought...

Wildlife Crime Unit, West Yorkshire Police

Sally Smart, Force Wildlife Officer, West Yorkshire Police

I was delighted to be asked to speak on Partnership Working by NatSca as my experience in working with Clare at Leeds has and is invaluable. Although I have the role here with West Yorkshire Police as Force Wildlife Officer, my expertise is with the enforcement of wildlife legislation, the gathering of evidence and liaising with CPS and I believe that I can accomplish this from my training over the years as a police officer.

However, though I feel confident and knowledgeable with the Law, I know that with some wildlife issues I need to work with experts. People who are able to identify species, who have knowledge about their subject, who can advise on the condition, best practice, habitat, housing the list is endless and Clare has been able to offer advice on many occasion, and was a real asset on a raid the Wildlife Crime Unit carried out in connection with endangered species being sold via the internet.

This partnership also developed when I set up a CITES training day. Clare was able to provide an excellent venue for a 'hands on' look at some of the endangered species we had talked about before hand. The partners who attended were able to see first hand just what an excellent resource the museum was and I know from feed back just how valuable everyone found this partnership working.

The conference was an excellent opportunity for me to explain how I need your support and how happy I am to support you all and to show partnership working is undoubtedly the way to go, to provide the expertise and knowledge we need to get the message across and move forward.

I am also delighted to say that as a result of the conference I now have two booking for talks at Castle Cliffe, Bradford - thanks Gerry!!

'Making progress through partnership – examples of public engagement with science through the creation of novel networks'

Dr Gill Stevens, Head of UK Biodiversity, The Natural History Museum (Contact: G.Stevens@nhm.ac.uk)

We are living in a time when environmental issues are high on the public agenda and we as scientists and the science-based institutions have a critical and unique role to play in building a scientifically literate public. If we are to take full advantage of the opportunities for improving the quality of life offered by scientific knowledge and discovery, it is crucial that we bring scientists and the public closer together in a constructive dialogue to explore issues such as the quality of local environments.

Due to the special situation afforded to institutions such as the Natural History Museum, as both a collections-based research institute and a major visitor attraction, the 'museum community' has many opportunities to be involved and indeed lead public engagement activities. These include public surveys of charismatic species, development of publicly accessible identification guides, providing training and speaking to our visiting publics.

In this article, I share with you just a few practical examples of projects that have successfully 'extended the reach' of the institution in which I work in and how this work has integrated, or will be looking to integrate, the expertise of both professional and non-professionals in the search to 'know nature'.

I will introduce several examples of these initiatives which have involved experimenting with new ways of engaging the knowledge and enthusiasm of a wide variety of actors in nature and how fostering interaction at the science-society interface has helped new audiences better understand the world we live in.

Over the last 10 years, the Natural History Museum has been spear-heading a programme of research and associated activities focusing on UK Biodiversity; documenting, understanding and very importantly, communicating to a wide variety of audiences, the interest and relevance of our subject. This has been a gradual journey and has proved to be a rich learning experience for all involved. It has meant taking experimental approaches and adjusting our motivation and ambition along the way.

The experiment began on a fairly small scale and initially focused on very specific publics – the amateur experts – the national schemes and societies and voluntary groups where we had a common interest. The original drivers behind this work were rooted in conservation policy, when there was a clear recognition by the statutory agencies for conservation that the biodiversity knowledge needed to feed the BAP process, was embedded within the amateur community, a domain that they had hitherto largely neglected.

This is when we began working to rebuild the relationship between these two communities, taking on the role of 'honest broker' in a variety of partnership projects. A few examples of which are given here.

ElmMap:
The Elm Map project was one of the first of the NHM's UK Biodiversity initiatives. We launched it in 2003 with the Ramblers Association and it has since expanded to embrace 12 partner organisations. We asked wildlife enthusiasts to locate and survey the few remaining elms that have survived the ravages of Dutch Elm Disease – some 200 mature elms have now been recorded and databased. The information is being used for a number of purposes, one of which is to support the Conservation Foundation with their project to raise new trees from Britain's native stock. The Ancient Tree Hunt is continuing to encourage people to map 'old, fat trees' across the UK.
http://www.nhm.ac.uk/nature-online/biodiversity/elm-map/elm-map-index.html
http://www.ancient-tree-hunt.org.uk/

Survey of the Bryophytes of Arable Land
Arable land is known to support a distinctive bryophyte flora but our knowledge of this group of organisms is poor. Few bryologists had focussed on the arable habitat, particularly in recent years. It was suspected that along side major changes in the abundance and spectrum of vascular plants in this habitat, that the bryophyte flora of arable land was also changing and the widely held opinion is that it was generally in decline but hard data were lacking. In response to this The NHM, Natural England and the British Bryological Society (BBS) embarked upon a survey of mosses, liverworts and hornworts of arable land. BBS volunteers were involved in this national recording scheme over a three year period. In June 2005, the survey was completed, resulting in **825 completed record cards covering 812 arable fields. The results can be found on the society's website.** (http://www.jonathan.sleath.btinternet.co.uk/SBAL/intro.htm)

The Riverfly Partnership
The Riverfly Partnership is another project that is demonstrating the value that amateurs can bring to biodiversity conservation. The Partnership enables anglers to get together with scientists and environmental organisations to build expertise and address declines in riverfly populations. In the three years since its launch, the Partnership has organised riverfly training workshops, published guides to the riverfly groups for non specialists, and developed a methodology enabling fly fishermen to monitor water quality which has been adopted by the Environment Agency. (http://www.riverflies.org/)

These partnership projects targeted particular specialist groups to work with and to meet particular targets, or to provide or help compile a checklist for particular groups of organisms.

Building on our experiences to date we are now embarking on a programme to extend this approach to reach a much broader range audiences and attempt to look at the wider topic of natural history. This is part of a drive to increase the breadth of our science public dialogue – and build a scientifically literate public.

This outreach work is being driven by the development of a new Centre for UK Biodiversity study at the NHM. It is part of our new Darwin Centre building that will open Autumn 2009. This will hold large parts of our entomology and botany collections and is designed such that museum visitors can get a better idea of our research work and the collections that we house. The ground floor contains the centre focusing on UK natural history; it will have lab space and is in close proximity to our wildlife garden with its richness of urban biodiversity, so ideal for training and education. It will provide easy access to key UK specimen collections, museum staff and their expertise.

Our more recent projects are engaging with a more diverse audience and we have taken a new approach, exploring the potential for members of the public to help contribute to a programme of science research:

Bluebell survey
Bluebells are one of Britain's best-loved wild flowers yet little is known about the distribution of the different species and the impact of climate change and hybridisation. A research team has been working to establish taxonomy through molecular and morphometric analyses of new collections made across the species range. But in Spring 2006 the Museum called on the public to help with this research programme. We asked people to search for, identify and record bluebells in their local areas. An easy-to-use identification guide and online recording forms allowed everyone, from children to scientists, to contribute.

This approach of developing web-based public participation to help assess the bluebell status in the UK has informed both scientific and public audiences. We view this as a model for public engagement with science,

backed by exemplary specimen based cutting edge research. The survey is repeated annually. www.nhm.ac.uk/bluebells

Our most ambitious project to date builds on our previous experiences and will be a combination of all our previous approaches, but on a much more grand scale……

The Open Air Laboratories Network - Inspiring discovery and celebration of the natural world

The Open Air Laboratories (OPAL) network is an exciting new initiative which received a grant from The Big Lottery Fund in August 2007. OPAL is encouraging people to get back in touch with nature by enabling them to explore and study their local environments. Through partnerships nationwide, OPAL is running projects which anyone can get involved with.
From playing fields and window boxes to bus stops or beaches, all spaces are different and all are important. The five year programme will bring scientists and the public closer together, allowing environmental issues to be explored which have both local and global relevance. OPAL aims to create a new generation of nature-lovers by getting people to engage with the natural world around them.

What is OPAL? OPAL is an exciting new initiative that is open to anyone with an interest in nature. Whether you are an amateur naturalist, a school student, part of a community group, or simply interested in learning more about your local wildlife and environment, there is something for you. OPAL participants around the country are discovering nature near them and learning how it can be enjoyed and protected

Nature needs you! Wildlife faces a growing number of pressures with populations of many of our most familiar animals and plants changing at an alarming rate. In partnership with Imperial College and the Natural History Museum, five national centres and nine regional universities will be running a wide range of events to engage the public with nature. By joining us in OPAL activities, you can help to build a detailed picture of the environment local to where you live, and learn how to identify and monitor the wildlife that you find.

Regional activities Across England, OPAL is busy developing a wide range of activities suitable for different age groups. You could be measuring minibeasts or learning about lichens, surveying wild flower meadows or finding out about the wildlife of your local pond or park. Keep an eye on the OPAL website to find out what's happening near you.

National surveys OPAL is also running a series of nation-wide surveys, each examining a different aspect of the environment. There will be studies into soils, biodiversity, water, air and climate which anyone can participate in. The first of these surveys will be soils and earthworms launching in spring 2009. These events and surveys will help to generate new research information, whilst developing skills and inspiring communities to explore, study and enjoy the local environment.

Please visit the OPAL website, a resource that will be developing into a dynamic forum for online recording and discussion, encouraging participation and engaging new audiences.

We are fortunate in the UK that our biodiversity is one of the best documented and understood anywhere in the world. But it is constantly changing. If, as a society, we are committed to tackling the environmental challenges ahead then scientists and the public need to face the future together. Unless we engage with and help equip the wider publics, there is a danger that we won't be able to assess what is happening or understand how wildlife responds to environmental change. We know that there is an army of enthusiasts ready to come to the aid of the natural world – and we are doing everything we can to mobilise it.

Developing a collections centre in partnership with a specialist supplier

Katherine Andrew, Principle Heritage Officer, Herefordshire Heritage Service

Herefordshire and its museum service

Herefordshire Heritage Service, the County Museum Service for Herefordshire came into being in 1998 with local government re-organisation. In the first ten years of operation, the re-established county has gone through major change, undertaking major development and rationalising use of buildings.

Museum service buildings and collections

In the late 1990s, with collections stored in more than twelve different locations across at least eight different buildings, the need to create a single collection facility was recognised. Time wasted in travelling between sites, over-crowded and therefore inaccessible storage with conditions varying between acceptable to totally unsuitable (for example the Wye Street store regularly flooded to a depth of a metre) were the major drivers to achieving this goal.

The acceleration of an idea into reality was accelerated with the re-development into a supermarket of the Grimmer Road store for the social history and archaeology collections. The viability of Churchill House Museum, housing period room settings, the Brian Hatton Gallery and the stored textile and decorative art collections was also, at this point, called into question and plans were put in place to close this site, with the site vacated in the summer of 2002.

Fig 1. New storage for the taxidermy specimens , no longer in overcrowded shelves.

The Friar Street site

The service had been unsuccessfully trying to locate a suitable replacement building for some time. In 2000, it was given a few weeks to purchase a redundant telephone repeater station in Friar Street, central Hereford. This L shaped building consisted of two five-meter high large rooms, a two storey block of smaller rooms and a basement containing a nuclear bunker and the boiler room.

The Museum Resource & Learning Centre project

A tender for phase 1, a basic refurbishment of one of the large rooms to create a store, was let in 2001. A Heritage Lottery bid was also being developed, but time scales meant that a rapid refurbishment was needed to allow collections to be re-housed and so allow the Grimmer Road site to be demolished.

Ocean Design won the tender for the initial fit-out, designing a basic system of ten compactor units with shelves at 750mm pitches and about 20 drawers for small objects. The archaeology bays were designed to take the standard sized archive deposition box, three deep per shelf. Compactor rails were installed to run the full 20m length of the store, a cost effective investment, worth making in order that additional compactors could be added later. The second large room was filled with re-used wide span shelving from the Grimmer Road site.

Phase 2

The Heritage Lottery Fund awarded the project a grant of £585,000 in the summer of 2002. In October 2002, store 1 was filled, with 17 compactor bases (33 aisles) in total in order to accommodate the costume and textile collections from Churchill House Museum.

A major organisational re-structure had occurred by this point. With the arrival of a new museum manager, a detailed scrutiny of the plans was undertaken. These showed some significant flaws in terms of the best use of the space and sustainability. For example the new build element was drawn with two lifts yet only a stair lift was planned for the original building leaving the basement area inaccessible.

Working closely with the Heritage Lottery Fund monitor and using the Prince 2 methodology as the project management framework, both the refurbishment (phase 2) and the proposed new build extension (phase 3) were re-designed, allowing work to commence on the phase 2 refurbishment in the spring of 2004.

Ocean Design again worked closely with the service designing a small scale reference library compactor unit and re-designing the layout of store 2. One bay of racking from store 1 was re-located since the large number of compactors had become difficult to work with, with a single access aisle. A small mezzanine was created to store the least accessed large items (ploughs, harrows etc) and the racking system made most effective use of the ceiling height.

Project planning for phase 3

The service was awarded a Heritage Lottery Fund project-planning grant and commissioned a detailed storage needs assessment from Ocean Design as part of this process. A number of other museum collection facilities were visited to look at storage furniture and public access and interpretation of stored collections.

A lengthy process of refinement of layouts followed, working in conjunction with the architect to ensure that collections would fit into allocated spaces. A number of specialised units were selected, for example, cupboards with vision panels for decorative art collections, entomology cabinets capable of taking existing sizes of drawers, herbarium cabinets, large and small rolled textile storage units and two aisles adapted as visible storage in store 1. Major refinements were planned, for example adding 150 extra drawers to store 1 and extra shelves to reduce stacking of archaeology archive to two boxes high. Making best use of existing cabinetry was an important part of the planning process, with units that had been bought off-the-peg incorporated into the plans and adapted, for example, work surfaces added to plan chests and drawer units re-allocated into new store areas. Only the wooden Hills carcases become redundant in the process.

Phase 3

A further two stage bid process followed, securing £1.3 million of funding from the Heritage Lottery Fund in late 2005. The project was tendered with work starting on site in the spring of 2006. The good relationship developed with the supplier and their thorough understanding of the collections became a vital element in the success of the project. For example, as building work progressed, a number of errors on drawings or un-thought through issues became apparent, Ocean Design were able to adapt, or in some cases, completely re-design storage layouts to accommodate this.

The site was returned to the service in October 2007 and, since then, staff and the local removal company have been moving collections and putting material through a quarantine freeze cycle. The centre opened to the public.

Conclusion

Although work on the collections is on-going, it is clear that space calculations have been accurate, that the correct proportion, number and sizes of drawers, shelves and cabinets have been ordered and that the collection will fit in the new stores. The storage furniture works well; it is well finished and easy to work with. The store layouts allow effective behind-the-scenes tours to take place with eight public open days planned for the first full year of opening and numerous pre-booked groups visiting the site. The site achieved full Accreditation in March 2008.

Further information

The theory behind the planning of this collections facility using the ten agents of deterioration is set out in:
Andrew, K.J. 2006 “Minimizing risks from the ten agents of deterioration in two new West Midlands Museum Resource Centres” Collections Forum; 21(1-2):70-84

Further detail on planning the Herefordshire Museum Resource Centre can be found in:
Andrew, K. 2005 “Applying the theory of minimizing the risks from the ten agents of deterioration at Hereford Museum Resource & Learning Centre” Natsca News 6:23-26

Ocean Design & Management, the storage partner for this project can be contacted at Rye House, 29 London Road, High Wycombe, Buckinghamshire HP11 1BJ tel 01494 473350 www.odam.co.uk

Real World Science

Andrew Lee, Project Manager, Real World Science. andrew.lee@nhm.ac.uk

The Real World Science project provides museum-based activities to support and enrich the secondary science and geography curricula. The project aims to:

- To support and enhance students' learning at the secondary level and to inspire students to progress in scientific learning at secondary and higher level
- To enable students to understand the impact that science has on their lives
- To provide role models to inspire students to consider studying science post-16 and beyond
- To support the development of creative, critical thinking and communication skills

The four museums in the partnership; the Natural history Museum, The Manchester Museum, the Oxford University Museum of Natural History and the Hancock Museum provide a range of curriculum based activities for Key Stages 3-5 (11-19yrs) giving students the opportunity to engage with museum and university scientist, to handle objects from the museums' collections, go behind-the-scenes to see science in action and to participate in fun and inspiring science shows and practical workshops. Over 11,000 students a year are now participating in these activities. The project is funded by the Strategic Commissioning Education programme (DCSF/DCMS) and has been running since 2005.

The Real World Science programme brings breadth, stretch and depth to the curriculum and helps children make sense of it by using the authentic science and science communication expertise of natural history museums. The museums' considerable educational advantages are used to enhance understanding of science curriculum concepts:

- awe-inspiring specimen collections
- exhibitions designed by specialists in science communication
- interactive exhibits and props designed to support science concepts
- museum staff skilled at capturing students' interest and engaging them in discussion
- links to the history of science and society.

The museums provide a real-world context for the science the students encounter in the classroom. Students see the importance and status science has within our society, by the museums' very existence and the quality of the displays and science on show. Students see that in this public place, science is for all, and meet enthusiastic museum scientists who counter stereotypes and open students' eyes to career possibilities. Some science encountered on a museum visit will fall outside the curriculum, providing background knowledge, context and complementing school science.

Responses from students involved in the programme allow us to monitor the overall impact of the programme. For example, students attending the A-Level Biology Study Day at the Natural History Museum are asked 'Has your visit [to the museum] affected any plans you may have for studying science further?' This has enabled us to report that in 07/08 that 27% of students attending this session stated that their visit has positively affected their plans to study science further.

Teachers' evaluation responses help to ensure that the programme meets their objectives in terms of both the content, quality and the practical logistics of the visit. Teachers are also provided with the opportunity to suggest areas for improvement. In the project year 05/06 we published the result of our consultation with Teachers *'How can natural history museums support secondary science teaching and learning.* Some examples of this feedback from teachers:

> '*They were fascinated. Very successful, linked in well with current syllabus.'*
> (Cardinal Vaughan Memorial School)
> '*Some excellent ideas here. Good lively presentation. Physical modelling was fantastic.'*
> (Icknield High School)

> '*They* [students] *looked fascinated! Great stuff. We'd like our teachers to teach like this!*' (Richards Lodge High School)

'*I thought the interactive nature and use of technology was very well used and created an exciting visual and kinaesthetic learning environment.'* (Thornden School)

'*All the students were really engaged. Some were truly* inspired.' (St Martha's R C School)

'*There was a tremendous depth and breadth of science presented in an accessible way.*' (Henry Box school)

The changes have been made in response to our evaluation. Alterations have been made to the timing and frequency of programmes; for example extra shows have been scheduled due to high uptake, and A-level programmes with increased capacity have been, and are being developed. Workshops have been scheduled later to allow for transport problems. The length of workshops has changed in response to feedback; a workshop was lengthened, for example, to allow for more time for students to search for microfossils under a microscope. Some teachers suggested that we include more practical demonstrations in our science show which we have done.

Real Earth Science - the partnership has just completed a 6 month feasibility study to facilitate a three-year project supporting the teaching and learning of earth sciences through on-site programming in museums (with natural history collections), video conferencing, online interaction and Continuing Professional Development of secondary science teachers. This bid is now awaiting a funding decision from a commercial sponsor.

Re-living the Great Debate; on of the interactive sessions with secondary school pupils engaged in Real World Science at the Natural History Museum, London.

The partnership has also been in discussions with museums, MLA, STEM, Science Learning Centres and other regional based organisations regarding the establishment of a national network to support secondary science teaching and learning with an overall desire to support museums wanting to provide programming for this audience. We are now considering the next steps to take this forward.

Aren't Birds Brilliant – in Glasgow

Naila Akram, RSPB

Aren't birds brilliant! In Glasgow is a two-year project that was set up to help inspire people about the amazing wildlife that inhabits the heart of this buzzing city.

It is based at Kelvingrove Museum, situated in the west end of Glasgow, which is currently Scotland's most popular visitor attraction, with over 3.5 million visitors each year. Kelvingrove has a deep-rooted significance to many Glaswegians, who visit it time and time again throughout their lives, and it was recently voted Glasgow's favourite building.

The surrounding Kelvingrove Park and nearby River Kelvin, are teaming with wildlife, providing a haven for many garden and woodland birds. Kingfishers, goosanders and sand martins breed along the river and even a pair of peregrines are prospecting to nest nearby.

However, this fantastic wildlife is completely unknown to many of the local people and visitors to the city. Working in close partnership with Culture & Sport Glasgow and Glasgow City Council, this project aims to address this need by better connecting people with their local natural environment and raising their awareness about urban wildlife. Situated in the heart of the city, people from a wide range of backgrounds are able to learn about and appreciate the fragile natural world that surrounds us.

We are doing this by:

- Sensitively installing CCTV cameras at appropriate wildlife sites, to beam live images from nest sites back to the Museum's Environmental Discovery Zone.

- Employing two Information Officers to help interpret the local natural environment and live CCTV images, engaging with over 16000 visitors p/a within the Museum. They lead daily-guided walks through the park, and offer a series of stimulating talks about local wildlife and natural environment in the museum.

- Establishing an environmental field teaching programme we engage with around 3000 school children, all the activities encourage children to get outdoors and experience nature at first-hand.

- We are developing an interpretation trail along the River Kelvin and through the Park, enhancing people's enjoyment of the area and raising their awareness of the wildlife.

Volunteers

We have a team of 15 volunteers who play a vital role in the delivery of this project. They engage with the public within the museum, carry out guided walks and support the Information Officers in delivering a programme of talks in the museum.

Additionally, volunteers help carry out bird surveys in the park and along the River Kelvin, enhancing our understanding of wildlife within the park and assisting the Park Rangers in creating better areas for biodiversity. This has included work to improve the banks of the river, naturalising the duck pond and planting areas of wild meadows to encourage more wildlife to thrive in this urban oasis.

Support

This project has received tremendous support from the local community, Glasgow City Council and Glasgow University. The Heritage Lottery Fund and Scottish Natural Heritage fund the project until March 2009.

Using DNA to verify sex and species identity of dried bird specimens: a tool for correcting specimen records

Patricia L. M. Lee, University of Swansea. E-Mail: p.l.m.lee@swansea.ac.uk

Meticulous archiving of biological material in past centuries has left us with a legacy of natural collections. The Natural History Museum's bird collection is an example: it includes a million skins and a million eggs, representing 90% of known species. These are rich sources for research, and archive collections represent a bank of DNA diversity for research. The sex of any given museum specimen has implications for its research potential, since sex is a key variable in a wide variety of studies, and correct identification of specimens is obviously critical for any study. Applying DNA-based tools to museum collections may be a means for checking and correcting species and sex information in specimen records.

PCR (polymerase chain reaction) technology has undoubtedly increased the potential for research using such DNA-based tools as it enables amplification of DNA fragments many thousand-fold from a small quantity of DNA template. However, museum material still present challenges because maximum PCR amplicon size declines significantly with specimen age, and fragments larger than 300 bp are difficult to am-

plify consistently. For example, Lee & Griffiths (2003) used a popular set of avian sexing primers to validate the recorded sex of moorhen skins. This utilizes differences in the length of two introns within the sex-linked CHD1 gene as markers for the Z and W chromosomes, producing amplicons in the region of 300–400 bp.

The oldest sample that could be sexed via this method was collected in 1910 and there was a significant relationship between specimen age and the success of molecular sexing. The effect of specimen age on amplicon length was confirmed using primers to amplify a range of different sized fragments of the mitochondrial cytochrome *b* gene (Lee & Griffiths 2003). Similarly, the 'barcode' method suggested as a standard DNA technique for verifying species identity of birds (Hebert et al. 2004) uses primers targeting a fragment of approximately 751 bp, too large for successful PCR of degraded archive DNA. One possible solution is to reduce the size of PCR amplicon targeted by primers.

Recently I examined the feasibility of extracting DNA from archive blown eggs, and PCR amplification of short DNA fragments (Lee & Prys-Jones 2008), and demonstrated improved DNA sexing methods for use with museum skin samples with primers targeting smaller amplicons than previously (Bantock et al. 2008). For the latter, two different techniques were designed for nonpasserine and passerine birds (Neognathae). The technique for nonpasserines was based on a new primer which, in combination with one existing primer, targeted a smaller amplicon in the CHD1 sex-linked gene than previously. Primers targeting ATP5A1, an avian sex-linked gene not previously used for sex identification, were developed for passerines. Comprehensive testing across species demonstrated that both primer pairs sex a range of different species within their respective taxonomic groups. Rigorous evaluation of each method within species showed that these permitted sexing of specimens dating from the 1850s. For corn bunting museum specimens, the ATP5A1 method sexed 98% of 63 samples (1857–1966). The new CHD1 method was similarly successful, sexing 90% of 384 moorhen specimens from six different museum collections (1855–2001). In contrast, the original sexing method only identified the sex of less than half of 111 museum moorhen samples.

A protocol was developed for extracting DNA from egg membranes and other internal debris recovered from the interior of blown museum bird eggs. A variety of commercially available DNA extraction methods were found to be useful. DNA sequencing of PCR products for a 176-bp fragment of mitochondrial DNA was successful for most egg samples (> 78%) even though the amount of DNA extracted (mean = 14.71 ± 4.55 ng/µL) was significantly less than that obtained for bird skin samples (mean = 67.88 ± 4.77 ng/µL). For PCR and sequencing of snipe (Gallinago) DNA, eight new primers for the 'DNA barcode' region of COI mtDNA were tried. In various combinations, the primers target a range of PCR products sized from 72 bp to the full 'barcode' of 751 bp. Not all possible combinations were tested with archive snipe DNA, but a significantly better success rate of PCR amplification for a shorter 176-bp target compared with a larger 288-bp fragment (67% vs. 39%) was found.

Currently work continues in establishing the minimum amount of sequence data required for species verification among snipe species.

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Collections and Partnerships in Birmingham

Leslie Noè, Thinktank, the Birmingham Science Museum.

Thinktank, the Birmingham Science Museum, is an independent charitable trust and in many ways is a unique organisation. The museum was built and fitted out as a Millennium Project (the largest outside London) at Millennium Point in the Birmingham regeneration area of Eastside – part of a wider project to develop a new learning and leisure quarter for the City. This will include a new Eastside City Park, the largest new park in Birmingham for over 100 years. The City Park will pass immediately in front of Thinktank.

Thinktank, although a museum, does not hold or own collections, but displays specimens belonging to the City of Birmingham and held by Birmingham Museum and Art Gallery (BM&AG), as well as other organisations and individuals, hence, the whole of Thinktank's work depends on partnership working. Currently, Birmingham as a City is significantly under provisioned with respect to the Natural Sciences so we are planning to develop and expand our provision to include not only enhanced museum displays and a presence in the City Park, but also additional school, community and outreach work. This year's NatSCA conference 'Working it out - Collections and Partnerships' was, for these reasons, of great interest and relevance to our developing plans. This short article will briefly explore Thinktank's current partnership arrangements, what was learned from attending the 2008 NatSCA conference, and how this will inform our future plans.

Internally Thinktank is organised into a series of 'teams' that requires partnership working both within and between teams. Regular Team meetings ensure commonality of purpose and guarantee everyone is fully apprised of the undertakings of other team members. Curatorial and display work is undertaken by the Exhibitions and Collections Team, and although communication between team members is excellent, we find it invaluable to hold weekly update meetings. The Exhibitions and Collections Team works closely with other Thinktank teams including: Formal Learning, for schools and booked groups; Informal Learning, which targets our drop in visitors; and Outreach, which takes daily pre-booked shows and workshops to schools and other external venues. Our work is supported by technical teams that maintain exhibits and interactives, and ensure safe, regular running of our historical exhibits (which for Science and Industry includes the world's oldest and third oldest working steam engines). Each Team leader is a member of, or seconded to, the Senior Management Team and this ensures good communication, top to bottom, throughout the organisation.

Thinktank's external partnerships are many and varied. Those critical to the Natural Sciences include our relationships with BM&AG and with the University of Birmingham's Lapworth Museum of Geology (LMG). This latter partnership is crucial, as it is anticipated the City's geology collections, comprising rocks, fossils and minerals, will soon be transferred to the LMG on long-term loan. However, experience shows that it is personal relationships that are so important to a sound working partnership. In this respect the NatSCA conference was excellent – the talks made the faces of speakers familiar and more approachable during breaks. Tea, coffee and lunch breaks were long enough to both refresh yourself and mingle amongst the participants, and the afternoon visits arranged you in one or more groups with a common goal. The wine reception and the annual dinner was an excellent opportunity to wind down, chat and have a drink, and the Saturday post-conference field trip threw participants together in a truly idyllic setting - and the lunch was, in true field centre style, home made and wonderful!

For me, perhaps the most useful programmed talks were those by Sally Smart, the West Yorkshire Police Wildlife Liaison Officer and Gill Stevens of the Natural History Museum in London on the first day, and Naila Akram of RSPB Scotland and Jo Mould of the BTCV on the second day. It was fascinating to hear Sally Smart's presentation on 'Police-Museum Partnerships', and how the Wildlife Crimes Unit was working with other organisations such as the RSPCA, HM Customs and museums, as well as networking and providing public education. I thought this was an interesting alternative 'view from the field' of the value and use of museum collections and staff expertise. Gill Stevens presentation 'Public engagement with science through novel networks' was valuable in attempting to tap into the large amount of information embedded in the amateur community by working in true partnership with various bodies. The museum provided a scientifically sound base, but ensured projects were 'owned' by the societies and their membership and not the Museum – a great lesson for all of us. Her emphasis on the importance of setting clear, shared goals, establishing clear ownership, of long term support such as adequate funding and offering of comple-

mentary skills was well made. The brief mention of the OPAL (OPen Air Laboratories) Network showed that no single approach is universal, the value of evaluating the needs and requirements of partners early in a project, to nurture goodwill and be realistic, share control, make resources sustainable and provide support for participants was excellent. These are lessons that we will undoubtedly take forward in our future endeavours.

In the afternoon I found the tours of the University Library Special Collections, with some truly amazing historical Natural History books, stimulating. The Anatomy Museum was wonderfully specimen led (although not strong on interpretation), but really brings home the value of real material if you want to fully understand a subject as complex as the human body. The tour of the Zoology stores, which covered a huge range of material, was of great interest – and I was never quite sure what would be found round the next corner.

Naila Akram's talk was, for me, was the best of the conference. The HLF funded project to engage visitors within the museum and outside in the adjacent Kelvingrove Park struck me as both innovative and invaluable. It also relates directly to Thinktank's prime position on the doorstep of Birmingham's planned Eastside City Park. Naila described using new staff and volunteers to take visitors on a bookable field teaching service, including guided walks and pond dipping. Two information officers are on-gallery 7 days a week providing fun, innovative interactions and guided tours showing endangered wildlife, outreach services and giving monthly talks.

Jo Mould's talk on 'Training the next generation of Naturalists', gave details of a project to train new naturalists in high-level identification and field skills covering specialist areas of the Natural Sciences. This was an excellent partnership between university departments, museums and an active conservation charity. Although too academic for Thinktank's core audience, it gave a fantastic idea of the partnerships that are possible between bodies with different skill sets. Both this and the previous talk reinforced, for me at least, the importance that museum Natural Science collections have for education and enlightenment of audiences of all ages. It also showed the importance of using the outdoors, which can include parks and green spaces close to the museum. This seems particularly important in urban settings like Birmingham where access to wildlife is often limited. Only by engaging with people in these ways can we hope to inspire a new generation of naturalists.

In the afternoon I managed an all too brief run round the Kelvingrove Museum and Art Gallery displays (to which I must return). Thence onto the Fossil Grove, which was an instructive visit to a unique, locally preserved and much loved locality. The Saturday trip to the field centre on Loch Lomond was a chance to get out and experience what museum work sometimes limits – time in the field. Not only a wonderful place to see plants and wildlife, but a site that has erected an interesting new building, the first built within the new National Park regulations, constructed of local materials with a built in low carbon footprint.

My attendance at the NatSCA conference gave me valuable insights into partnership arrangements in a wide range of organisations. I made valuable contacts, and was able to feed important information back to the Collections, Education and Outreach Teams here at Thinktank. Our plans to expand our Natural Sciences provision have undoubtedly been enhanced and we will plan to make full use of Birmingham's new Eastside City Park development on our doorstep. Thank you NatSCA!

Institutional Abbreviations and addresses:
BM&AG – Birmingham Museum and Art Gallery, Chamberlain Square, Birmingham B3 3DH
LMG – The Lapworth Museum of Geology, University of Birmingham, Edgbaston, Birmingham B15 2TT
Thinktank – the Birmingham Science Museum, Millennium Point, Curzon Street, Birmingham B4 8JZ

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Glasgow Botanic Gardens Tour. Friday May 16th 2008.

Lindsey Loughtman, Manchester Museum

A beautiful sunny afternoon saw a group of 7 of us from NatSCA walk up to the Botanic Gardens in Glasgow's West End. It is free, open every day from 7am till dusk and therefore accessible to all. It was also very busy with picnickers, dog walkers and families – and has around 500,000 visitors per annum. Paul Matthews, Curator, gave us an informative tour on the history, development and activities of the Gardens.

The gardens date back to 1817, but have occupied their current grounds since the late 1930's. Professor William J. Hooker, Reguis Professor of Botany at the University of Glasgow (1820-41), took an active part in the development of the Gardens, and went on to become the first Director of Kew Gardens. Local man John Kibble started building his enormous glass house near Loch Long in the 1860's. It was then decided to move it to Kelvinside so it was dismantled, moved to Glasgow by barge and rebuilt in the Botanic Gardens. Its original function was as an entertainment venue, but ventilation was added in 1880 to allow plants to be grown. Kibble was quite a local character. Having inherited money from his parents, he cycled across Loch Long on a floating bicycle, and also built himself the world's biggest camera – a horse-drawn one!

The Kibble Palace, after restoration.

The Kibble Palace closed for restoration in September 2003 and reopened to visitors in November 2006 at a cost of £7.2 million, funded jointly by Glasgow City Council, Historic Scotland and Heritage Lottery. During this time, the plants were moved out of the Grade A listed glass palace, although there was more concern from the public about the fish in the pond; some of the carp were over 30 years old! Of the cast iron structure, over 500 parts were dismantled and transported to Yorkshire to be restored. Now, more than 98% of the original structure remains, with new strengthened glass, benches, and artist designed glass interpretation panels.

The Kibble Palace, one of Glasgow's most famous attractions, now holds a wonderful display of Killer Plants, showing convergence of evolution, and a geographical representation of many well known plants in the main dome, such as Rhododendrons, Jasmine, *Camellia* and *Banksia.* We also saw the National Council for the Conservation of Plants and Gardens (NCCPG) Tree Fern Collection.

The other large glass house in the Glasgow Botanic Gardens, known as the Main Frame, has 11 sections, including economic plants, arid plants, a tropical pond and Orchids, including the National Collection of Dendrobium. It also houses the National Collection of Begonias, and volunteers from the Begonia Society manage a potted begonia display in this glass house, which is rotated to ensure there are always flowers on display.

Education. In the past, the Director of the Botanic Gardens has also held the post of Professor of Botany at Glasgow University. Plants here were then used to teach taxonomy. Now there are around 90 school visits a year, looking at topics such as rainforest, woodland, and plant uses. There is one member of education staff. The Horticultural College in Ayr, Plant Kingdom courses at Strathclyde and Glasgow Universities and the Royal Botanic Gardens Edinburgh visit annually. During our visit a school had taken over the grass area in front of the Kibble Palace for their sports day, which was wonderful to see.

The Glasgow Botanic Gardens holds an annual Weekend Orchid Fair which attracts around 5 to 6,000 visitors. Other events held here include such as Moths, Bats and Owls Night, Shakespeare plays and meetings of local horticultural societies are hosted.

The museums of Glasgow.

Clare Stringer. Curator, Natural Science, Leeds Museum Discovery Centre.

Glasgow is blessed with two excellent natural science collections: the city's and the university's. Where other cities have let one or other of these fall into, at best, 'disrepair', Glasgow has invested and taken pride in both these assets.

NatSCA delegates were treated to tours of Kelvingrove Art Gallery and Museum and the university's Zoology Museum, Hunterian Museum, Anatomy Museum, Hunterian Art Gallery, Mackintosh House and Special Collections in the library.

The Zoology Museum

During much of the first day of the conference we were fortunate to be located in the Zoology Museum. Based deep within the university's Environmental and Evolutionary Biology department, this one-room gem features everything you would expect from a working university biology museum mixed in with more universally appealing displays. Older, hessian-lined cabinets had been thoughtfully revamped with simple colour-coordinated backdrops. Occupying the same space as some of the large taxidermy, without being cut off by glass, was also pleasant (Fig 1.).

Sadly, it was not quite possible to ignore the temperature. Apparently fifteen years of struggles have still not resulted in the museum being anything but stifling. Fans were employed to keep the guests cool but it was difficult not to wonder what effect the heat was having on the display objects. Some of the taxidermy on open display did have splits in the skin but it was difficult to tell if this was modern damage.

Fig 1. Inside the Zoology Museum at the University of Glasgow.

A recent addition to the gallery has been the insect displays. A model centipede helpfully uses its sections as an excuse to show off parts of the entomology collection. Specimens have been grouped into stories – beauties, rarities, form, function, popular culture etc. – with the opportunity to find out more through a large number of display drawers. As is so often the case, the opportunity for layered investigation was one of the reasons that this exhibit was a hit – it was as easy to skim over the areas of little interest as it was to find out more about the absorbing ones. The other feature that made this display a success was, of course, the large number of *actual specimens* it used.

Peppered around the room were other well-thought-out treats. The glass case of living harvest mice provided something slightly out of the ordinary and was a nod to the work on animal structures carried out at Glasgow. The enormous python in the corner and leatherback turtle suspended from the ceiling were both eye-catching. Lastly, a small display on shed tarantula skins had me engaged for far longer than I would have expected.

The Hunterian Museum

Scotland's oldest public museum reopened to the public in May 2007 after a complete redisplay. The work was carried out by an in-house team to a high standard – they have done well with a smaller budget than a lot of recent large museum overhauls.

Centre stage, and rightly so, is Dick Hendry's elephant skeleton. Originally located in the Zoology Museum, the re-hung skeleton now dominates the entrance hall (Fig 2.). Its display is further enhanced by the speeded-up footage of Dick and his team disassembling and then reassembling the elephant – a great way

to exploit the universal appeal of 'behind-the-scenes' activities.

There appeared to be a good deal of respect given to the natural science collections at the university by the displays at the Hunterian (Fig 3.). Whole cases were dedicated to just one or two natural history specimens - their story was not lost in a case full of other objects. The oversize mineral and entomology drawers were inventive and the Thylacine was listed as the top 'must see item' of the displays (Fig 4.).

Fig 2. Dick Hendry's elephant skeleton displayed proudly in the centre of the entrance hall.

Fig 3. One of the displays at the Huntarian.

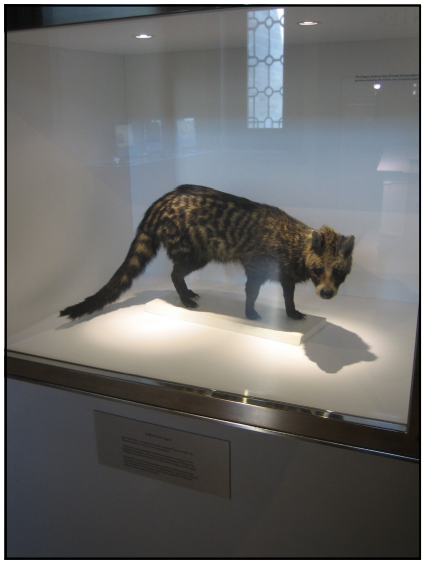

Fig 3. The recently extinct Thylacine.

The Anatomy Museum

The Anatomy Museum is open to the public by appointment only but it was full of people when we arrived (and not because we had arrived!). Students and visitors regularly visit the balconied room for study and literally out of morbid curiosity. Not for the faint hearted, this extraordinary collection includes William Hunter's famous plaster and lead casts of the gravid uterus along with a spectacular array of human and animal parts, diseases and foetuses. It was a treat to be admitted – may it never be changed or 'updated'.

Special Collections Department at Glasgow University Library

This addition to our tour was a welcome one, despite juggling the logistics of getting thirty-odd curators in a lift (you can't by the way). The Department had kindly put out a display for us of some of their botanical and zoological gems: from old tomes on classification and identification to beautiful hand-coloured illustrations – Audubon's *Birds of America*, bought on subscription by the aspiring university in the 19th century, being a highlight.

The Hunterian Art Gallery and the Mackintosh House

No visit to Glasgow is complete without some reference to Charles Rennie Mackintosh. The Hunterian Art

Gallery has a reproduction of his house in an annex – crisp white rooms and his distinctive style dominate, of course, and there was more than one whisper of 'Ikea'. The Art Gallery itself is packed with treasures including an impressive J. M. Whistler collection.

Kelvingrove Art Gallery and Museum

The second day of the conference was held at Kelvingrove Art Gallery and Museum. Re-opening to the public in 2006 after a three year, £27.9 million restoration programme, the museum is now looking fabulous. The stonework shines and the displays are noisy with excited kids and nattering visitors).

As in the Zoology Museum, much of the large taxidermy is on open display. A lot of work was put in to creating psychological barriers to visitors and in some cases these have been a success. Where they have not worked, glass screens have been put up to stop wandering hands (Fig 5). With open display comes the constant worry of pest and light damage and controlling the temperature and humidity. Laurence Simmen, the natural history conservator at Kelvingrove, makes constant checks of the galleries to guard against this but light still pours into the main display areas. Having written that: there are no obvious signs of damage, the taxidermy looks amazing and the public love it.

Fig 5. Glass screen to protect specimens from touching.

Eye-catching centrepieces were a deliberate design feature in the redisplay and they work very well. Orientation was considered complicated in this symmetrical building and so Giant Deer, fighting stags, spitfires etc. can be seen from a good distance away (Fig 6).

Another success at Kelvingrove has been the guided tours. At the leatherback turtle we ran across a very enthusiastic RSPB guide explaining the details of cloacal breathing. The gathered school group were rapt. The museum runs tours daily, a great service to offer new and, especially, repeat visitors.

Kelvingrove's other great design choice was to start with the story rather than the object. This meant plenty of natural history mixed in with other disciplines. Shark jaws lie alongside shark-tooth swords and the flight of the spitfire is discussed alongside gulls and butterflies.

Fig 5. Large natural history centre pieces throughout the galleries.

All in all the 2008 NatSCA conference was an engaging and very enjoyable event. And how could it not be? - interesting people, interested people, good speakers, passionate hosts and, importantly, wonderful venues.

It was interesting to see so much taxidermy on open display. I think I would be too scared to try it myself but it did look stunning and was certainly appreciated by the visitors.
It is unusual for a natural science museum to have competition in the same city but Glasgow is spoilt. We were lucky enough to be hosted by two institutions with outstanding natural science collections and the displays to boot. Many delegates left with not a little jealousy.

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Report on the NatSCA Conference at Glasgow – 15th-16th May 2008

Claire Sturman, Natural Science Officer at Portsmouth City Museums and Records Office

This is a summary of the eight talks and the tours that took place at the NatSCA conference. They were all enjoyable and showed a selection of many different partnerships that museums can be part of. They gave me something to think about and new ways of promoting the museum I work at, particularly the natural history collections.

I travelled up to Glasgow on the Wednesday and found the B&B rather quickly – it was only 1 minute from the Kelvinbridge tube stop. I made myself comfortable then went off to find the Zoology Museum ready for Thursday morning.

After registration and being issued with the conference pack and name badge, it was the welcome by Mr Ewen Smith, the Director of the Hunterian Museum. We then settled down for the first presentation of the day. Alec Coles from Tyne and Wear Museums gave a talk on the new Great North Museum to be opened early 2009. It is in the old Hancock Museum and incorporates the Museum of Antiquities, Shefton Museum and the Hatton Gallery. It hopes to renew an interest in Natural Science and archaeology in the North East region. It wants to be able to put a view of the whole world in one place and for it to be a "gateway to the landscape". Partners on the project include University of Newcastle upon Tyne, Natural History Society of Northumbria, Society of Antiquities of Newcastle upon Tyne, Tyne and Wear Museums and Newcastle City Council.

The project sounded exciting with the combining of all the museums into one area. Much consultation took place with visitor groups such as disabled and other focus groups. Each stage was signed off once completed and only one person had full control. This would help the project move forward and ensure nothing was missed along the way. Also by only having one person sign things, the standards and ideas were consistent throughout. This sounded a simple yet effective way of making the partnership works.

The second presentation was by PC Sally Smart. She gave an interesting lecture on the work of a Wildlife Liaison Officer in West Yorkshire and her responsibilities in training and coordination of the other Officers within the Division. She has made contacts and partnerships with many different organisations including museums, bird of prey training, gamekeepers, wildlife groups and Customs and Excise. The Police work in partnership with volunteer wildlife groups by sharing skills and data. For example, the Police use their rope access skills to retrieve chicks from birds of prey nests. The wildlife groups have the expertise in handling chicks to take DNA samples from them and complete the records. The two groups then share the DNA data to help protect the birds from poachers and to detect nest tampering.

The Wildlife Liaisons attend roadshows to bring the issue of Wildlife Crime to the public. They do this in partnership with museums (who lend them articles for display) and other organisations that wish to be promoted.

The biggest partnership the Wildlife Liaisons hold is with Museums. The Museums can provide training venues, object handling and identification skills. They also help with identification in raids and for members of the public. I enjoyed the talk, as it was an area I had not explored myself, and will now think more about how the museum I work in could work with outside organisations

Dr Gill Stevens is the Head of UK Biodiversity at the NHM, the speaker of the third talk on the partnerships between amateur-expert groups and the scientific community, and how the NHM acts as a link between the two. They came about from the need to collect data from the environment and as a way to unlock the data held by the amateur-expert groups across the country. One such project using this partnership model was ElmMap. It was aimed at mapping the survivors from the Dutch Elm disease by using rambler groups trained in the skills to record and identify the trees found on their walks.

Dr Stevens pointed out that such projects only work well when there are shared goals and good will is nurtured from the beginning. Clear ownership of the project is essential so that the correct acknowledgement is given. Scientific underpinning is also vital to give trust and authority to the groups bringing in data. An interesting point that was made was the role of the Social Scientist – they are invaluable in helping groups work together and giving advice on mediation.

The other partner that Dr Stevens talked of was the general public, but getting them involved in the same way as the amateur-expert groups was trickier. Lessons were learnt from a bluebell survey done several years before. When it was re-launched, the scientific and public explanations were simplified and the project was a success. By giving clear scientific purpose to the project, people are more willing to get involved as they can see how they are contributing. Another project was the Open Air Lab Network (OPAL) to encourage the next generation of naturalists and environmentalists, aimed at encouraging people to meet real scientists and to study, enjoy and protect their local environment

The final talk of the day was given by Kate Andrew, the Principal Heritage Officer from Hereford Museums. The presentation was on the new stores that were designed and installed by Ocean Design. Whilst not a partnership in the same manner as the previous talks, it highlighted the need for consultation with designers. One aspect that had to be included was the need for open storage as the store had Open Days throughout the year. Two rows were chosen to have glass-fronted cupboards and glass-topped drawers at wheelchair height. They had to be accessible to the curators as the contents were changed depending on the day's theme. One idea I will be using in the future is the fixture of magnets to the bottom of mounted birds so they are held in place on the metal shelving – easily accessible but without having them slip around.

In the afternoon, I went on the Zoology and Thurso Street stores tours. It was intriguing to hear how curators have hardly touched the Hunterian Collection. Even when moved to new drawers, the specimens were photographed and put back in exactly the same order. Geoff Hancock showed us the collection of old collection boxes. I liked the ones disguised as books, yet the "titles" gave them away. The King collection showed a glimpse into the collector himself – he worked in an art collage (lots of pencil boxes) and had a love of cigars! We were then allowed to have a wander around to explore for ourselves, peering into cupboards and drawers. The Thurso Street stores, which held the geology and ethnographic collections, proved to be ideal conditions despite its location (between a garage and flour mill) due to the thickness of the walls keeping the temperature relatively steady. The Hunterian deals with bulk entries by assigning a HUG number (Hunterian Un-catalogued Group), but no individual numbers are given out. This fulfils accreditation and at a later date, individual numbers can be given. The highlight of the tour was being allowed a glimpse of the mineral proustite. The rare mineral is very sensitive to light, starting as a ruby red colour, then fading to dull grey – this specimen was still ruby.

Friday 16th May 2008

After the welcome by Alison Reid, the Visitor Service Manager to the Kelvingrove Museum and their new facilities, Andy Lee gave the first talk of the day from NHM. Andy is the Project Manager for Real World Science, a partnership between NHM, OUNHM, Manchester Museum and the Hancock Museum, which began in April 2004. The aim of Real World Science is making science relevant to secondary schools and to promote it as a career choice. It also aimed to give basic science to those choosing not to follow it after GCSE's. After consulting with schools it was revealed that the priority was to give more support to those teaching science subjects at KS3 and KS4. It was also felt that more should be done to highlight the differences between museum and school learning styles by offering formats not found in the classroom. Partnerships with people who have experience of secondary teaching were also created. Changes in the National Curriculum, such as the provision more school trips and the inclusion of 5 hours of culture into the week have helped museums get schools in. By working with the schools, many of barriers surrounding school trips have been removed or reduced.

The Projects is down to the amount of promotion and the addition on online resources. The MLA has begun to encourage student teachers to take placements within museums to let them see what a great resource they are and to encourage future visits. This is still mainly being done with primary schools, but it is hoping to attract more secondary schools. The Real World Science Project receives continuous feedback to help it expand and keep up with needs. It hopes to include more sites in the future, reaching into all areas of the country.

The second talk was given by Naila Akram from the RSPB. A partnership was formed between the Kelvingrove Museum and the RSPB to educate people about the environment around them. It was astonishing to hear that people thought the blue tit was an African bird and were surprised to learn they could attract it to their own gardens! The park near the Museum has plenty of wildlife to offer; from cormorants to otters. The Glasgow City Council, Park Rangers and the Department for Culture and Sport in Glasgow have supported

the partnership. Funding has come from the HLF, Scottish National Heritage and by providing lots of muffins! New staff have been employed to specifically work at the Museum with the aim to introduce a balance between the formal teaching of the interpretation and schools with the informal of people having a chat on their days out. Volunteers also help the staff in these roles.

To compete with the shops to get visitors interested, smaller projects were added to the programme and the most successful was the blue-tit webcam whose images were added to the website. The Staff also offered guided tours of the Museum, combining the Museum collection with the wildlife of today allowing people a close up view of the creatures they could expect to find. Guided walks around the park help people to appreciate the landscape and wildlife, and also get the communities involve. It would also have the effect of getting people out to the nature reserves near the city and vice versa.

As with all projects there were hurdles to overcome. The main one was the difference in approaches to bureaucracy, procedures and deadlines within the various partners. The other was convincing the RSPB to allow the use of stuffed animals. By explaining only those from reputable sources were to be used and that it will help people help future creatures not end up in that state they became convinced.

Jo Mould, Development Manager from the British Trust for Conservation Volunteers (BTCV), presented the third talk. She talked the BTCV apprenticeship scheme in environmental volunteering. A skills gap has been recognised in the environment sector as many of the existing work force are approaching retirement age and there are no replacements coming forward. The Apprenticeship scheme works by providing placements with partnership museums and other organisations. Each successful applicant is given a bursary, a mentor and sometimes a specialist too. A development programme is devised which can also include conferences and workshops alongside the normal training. With the demand for specialist, not generalists, being high the programme gives the Apprentices focused training in the chosen field. The roles of BTCV and the partnership organisation are clear from the start, which helps contribute to the success. BTCV provides the money, the apprentices through advertising and interviews, additional conferences and workshops and also advice on how to construct the programmes. The partnership organisation gives the apprentice the practical experience, daily supervision and the direction of the work.

At the end of the programme emerges a fully experienced and accredited Apprentice ready to take on the chosen subject. The hope of BTVC is to keep them within Scotland and Northern Ireland where the scheme is being piloted and funded, but they realise they can't stop them. BTCV hopes the scheme can be extended to England and Wales and is looking for organisations willing to take on apprentices. I thought the scheme sounded a great way to train the environmentalists of the future and would suit graduates and also those wanting a career change. By working with museums, the apprentices will also gain curation of collections, documentation and identification skills not found elsewhere.

The final talk of the day was given by Dr Patricia Lee from the University of Swansea. This was a fascinating talk on the use of DNA to determine bird species. It was delivered well, and even I could understand the science behind it all. A technique has been developed to determine the DNA of birds from eggshells and feathers. An example was given from the mis-identification of British Sparrow hawks. The male and female birds have obvious differences in size, but the complete bird is needed to see this. DNA can help to re-label birds that may need conformation.

The University of Swansea has been working with collections as far back as 1850's. They have found that small samples work better and the *primer* used depends on the age of the specimen. It is hoped to create a bank of DNA barcodes of the many species but no one can decide which segment to use. The sample is taken from the membrane inside the egg, leaving the shell untouched and using a hole already present from blowing. The technique is still destructive, but the overall appearance of the egg is not affected.

This was an interesting talk on how museums can be part of a greater partnership with science. They are stores of information, much of which is not available in the wild any more or not easily accessible. By using museum collections, costs to institutions are greatly reduced as there are no fieldwork fees – all the samples and data are already collected. Museums also receive the benefit of having the collections scientifically checked for species and the unidentified finally being named so their records are updated.

In the afternoon I joined the trip to Fossil Grove. This is a site in Victoria Park where several fossil tree stumps where uncovered landscaping of the park. Their significance was noted and a structure was built to

preserve them. The roof has been replaced since, but the rest of the building still stands. The site is run by a partnership of UKRIGS (Strathclyde Group), Glasgow City Council, Scottish National Heritage and Geological Society of Glasgow. There are interpretation boards in the building and plans to update the structure.

On Saturday I went with others to brave the midges at the Universities Field Centre near Loch Lomond. They have purpose built centre, and I was surprised to hear that the rooms planned for the new building included en-suite rooms for the students! I don't remember having anything like that on my field trips.

I really enjoyed the whole conference. It was good to hear about the different experiences of partnerships from a variety of speakers. I also feel more confident about forming partnerships, and what makes them work successfully, but also how to work with any problems that can occur. I also enjoyed meeting other curators with Natural History and swapping stories and believe that events such as this one are great places to make new friends and contacts within the field.

Acknowledgments:
Thank you to all those that organised and gave presentations at the Conference for a superb event. Also thank you for providing the bursary that enabled me to attend – it was certainly worthwhile.

New Professionals Conference—Liverpool. October 7th 2008

It is our pleasure to invite you to attend the **New Professionals Conference** (NPC) organised by Bournemouth University and National Museums Liverpool. This one-day museums conference will focus on the experiences of students and new museum professionals, as well as highlighting current research and topical issues in museology. The Conference will take place at the **Merseyside Maritime Museum, Liverpool on October 7th, 2008.**

The aim of the NPC is, first and foremost, to provide a platform for students and new professionals in the field of museums to share their research. The day will afford the opportunity for networking with fellow museum professionals and academics as well as current students and graduates.

The NPC is unique to the museums sector. Currently, there are no other symposia, conferences or colloquia that give museologists from across the UK, or internationally, the opportunity to come together and present research or professional practice and understanding. So with this in mind, we strongly encourage students and new professionals to consider submitting abstracts for presentations. The NPC is an excellent forum to present and demonstrate findings, methods, and approaches that have proven successful.

Also, if you would like to attend without giving a paper or poster presentation, please register at the website above by going to the 'How to register' page. The cost of registration has been generously subsidised by National Museums Liverpool to encourage as many budding museologists to attend as possible!

If you have any further queries about the Conference or submissions and registration, please contact Hannah Paddon at: npcenquiries@bournemouth.ac.uk

We look forward to seeing you there!

Conference Organiser: Hannah Paddon
Programme Leader, Bournemouth University: Yvette Staelens
Representative from National Museums Liverpool: Francoise McClafferty

Taxidermy in Museums…is it dead?

Elieen Hoey. Postgraduate, Newcastle University. (E.B.Hoey@newcastle.ac.uk)

I have always been fascinated by Natural History and archaeology and attempted to combine both interests in my undergraduate dissertation *Analysis of the Ichthyological Remains from Garumelé, in the Medieval Sahel (900-1600 AD)* (awaiting publication) which was based on the material excavated by Dr. Haour in 2005 in Niger. Although this was a very challenging piece of work, in that I had to create my own photographic reference collection, due to a lack of material on the subject, and prepare some of my own specimens, it was incredibly rewarding and spurred my enthusiasm for faunal osteology (Fig 1.).

This encouraged me to enrol on the Museum Studies course at Newcastle University, in the hope of taking the Natural Sciences module. Throughout the course of this module I worked closely with the Natural History Society of Northumbria and the Hancock Museum and was fortunate enough to be allocated an incredible specimen in the form of an albatross which I was to actively research and conserve in preparation for its display in the new biology gallery in the Great North Museum (GNM).

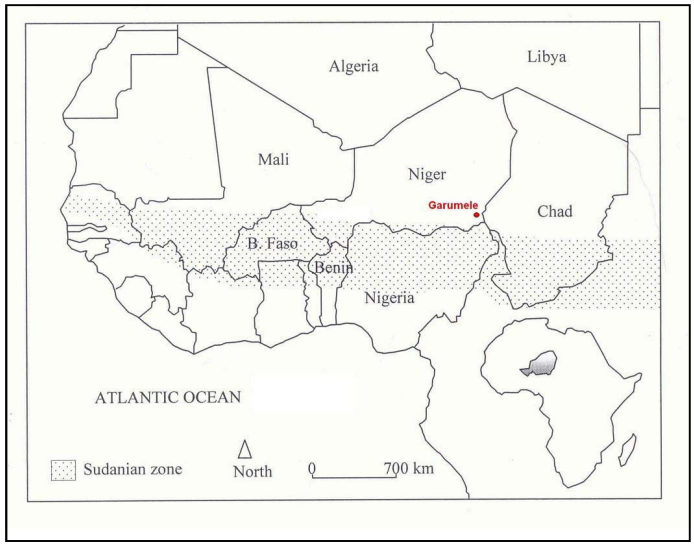

Fig 1. Map showing Garumelé, in Northern Africa.

Whilst working on the specimen I attended a Taxidermy Training Day hosted by Les Jessop at Sunderland Museum and Winter Gardens. This, in addition to various museum outings, inspired me to explore possible research questions for my dissertation that were taxidermy related.

After careful deliberation I narrowed the aim to the issues surrounding the open display of taxidermy in museums. It has become a popular choice for many museums through the UK and continental Europe and the impact that open display has on an individual is more intense than that which is gained when viewing a specimen from behind a glass barrier. The individual is free to get up close, explore it from all angles and get a sense of perspective. It's a personal interaction and above all it's memorable. However, there are issues which occur with open display and it is these problems that I hope to discuss in my post graduate dissertation; *Taxidermy in museums…is it dead?* The research aim is to investigate the potential conservational problems which occur when taxidermy specimens are placed on open display.

The paper will address the history of taxidermy and its display in museums (Fig 2.). Potential conservation issues surrounding the control of relative humidity, light, pests and dust, on openly displayed specimens, shall be the main focus of the paper and the plausibility of maintaining a constant supply of replaceable specimens will be addressed i.e. will the supply meet the demand when specimens begin to look worn? Do museums budget for the replacement of specimens? Are there enough taxidermists employed by museums today?

Fig 2. A stuffed albertros.

The NatSCA conference provided an excellent opportunity for me to research these issues. Kelvingrove Art Gallery and Museum, allows the public a lot of access to their collections and it was interesting to see how the museum has overcome some of the initial teething problems of their new £27.9 million refurbishment; i.e. finding the balance between accessibility and protecting specimens by introducing a minimum distance of just over an arms length between the specimen and the visitor (Fig 3.).

I hope to use the knowledge I gained from this year's conference as a foundation from which I can tailor my research towards other museums and their practices with regard to the open display of taxidermy.

If anyone has any thoughts, or contributions to my research, please get in touch!

Fig 3. The 'stampeed' at Kelvingrove Museum. Displaying these large mounted animals in one of the main galleries allows people to see the real size and the detail of the specimens

Pest Management in Practice – 2008 - 10th December 2008
Kelvingrove Museum and Art Gallery, Glasgow

ICON
THE INSTITUTE OF CONSERVATION

It is now 6 years since the pioneering conference "2001 - A pest odyssey" held at the British Library. Many of the new developments in IPM, which were first aired or discussed at that meeting, have now been put in to practice. Others have been refined or maybe even overtaken by changes in practice. At the ICON "Pest Management in Practice" meeting, held at the Imperial War Museum in 2007, we heard the experiences of those who have implemented IPM in many different collections since 2001. We also found out which are the most effective treatments to use for treating collections and how well they work in practice. Promoting the value of IPM to the many small museums and houses by training and sharing experiences was also shown to be very successful.

For further details visit: www.icon.org.uk

Another update on computer printer inks and papers for internal labelling of fluid-preserved specimens

Simon Moore, Senior Conservator of Natural Sciences,
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Chilcomb Lane, Winchester SO23 8RD.

Abstract
Since the advent of the PC there has always been a debate to improve the appearance of labels in jars of biological specimens preserved in fluids ('wet collections'). The debate centres around which ink and which paper is going to look the best and last indefinitely? The problem is long-term testing.

Introduction
Ever since my first label was written in the Natural History Museum's arachnid section back in 1968 I have always maintained that the best way of retaining vital data on a label immersed in preserving fluids, of which many are also solvents, is using handwritten Indian ink on 'Goatskin Parchment' paper. Bear in mind that these fluids are continuously being contaminated with dissolved organic compounds from the preserved specimens.
Since personal computers appeared there has been an ever-increasing number of inks that purportedly 'last for ever' in preserving fluids of all kinds. In reality these may be stable during our working lives but may not last beyond another 30 years.
I have always maintained that a back-up label in the fluid is essential, comprising goat skin parchment with required data written in Indian ink (see also inks).

Papers
There are various papers which have been found to be suitable for this purpose:
Goatskin Parchment (Arjo Wiggins and Wiggins Teape –see suppliers), Tyvek and Resistall. None of these was apparently perfect since Goatskin Parchment used not to be not white enough for some, although there has been a white version available for some time.
Tyvek is also white but tends to be fibrous and ink can bleed into it giving a slightly smudgy and unsatisfactory data set (Fig. 4). However it has been found to be good for printing (see further down).
Resistall also is good but recent research shows that it is acidic due to its manufacturing process and can lower pH levels in smaller containers (up to c. 400ml).

Inks & pens
Computer inks will produce a perfect-looking and professionally-styled label but the problem is of longevity.
Studies were carried out back in the 1990s to find which was most suitable.
Some faded or gradually dissolved away in the fluid and turning it blue, other inked letterings lost their adhesion to the paper and detached to the bottom of the jar as 'alphabet soup' (Wheeler *et al.*, 2001)
The debate is still continuing today although many notable improvements have since been made.

Pigment ink pens are good and those supplied by Edding (1800 or 1880 series) have lasted well since 1991 and show little or no sign of fading in an assortment of preserving fluids, including (alkaline) potassium acetate and glycerol mix (Kaiserling 3).
Pigma pens have shown a slight instability in alcohol (IMS or Industrial Methylated Spirit) and have noticeably faded (Bristol University Pers. Comm.).
In each case the ink should be left to dry for at least 5 minutes prior to immersion.

Test against fading and solution over 7 years
Samples of Old (cream coloured) and New (white) Goatskin Parchments and Resistall were labelled using an old Amstrad PCW dot matrix printer (normal print an bold, and no longer available!), Indian ink, and Edding profipen pigment ink. These labels were immersed into 80% IMS, 10% formalin (4% formaldehyde, aqueous solution), Formol-Saline (as before but with additional 1% sodium chloride), Kaiserling 3 Preservative, Steedman's fixative (10% formalin, propylene glycol and propylene phenoxetol) and Steedman's PFP (post-fixation preservative: same formulation minus the formalin). There were no specimens or additives put into the jars – the testing was purely for fading and any ageing effect of solution on the inks and papers.

The 'Goatskin' labels were immersed in the fluids on 6.12.1999 and the Resistall (after a delay in delivery) on 10.2.2000.
pH reading of the fluids were taken and the jars were stored at the back of the laboratory, subject to day-to-day UV dosage, fluctuations in humidity and temperature. To ensure evenness, the printer ribbon was renewed for the two dates.
On 11.5.2007, the labels were removed, rinsed in deionised water, blotted and air-dried and then photographed without flash and using the same light source for each. pH readings of the fluids were also taken to check for any difference but bear in mind that all of the papers were in the same jar of each fluid for the duration of the test.

Results

(GP = Goatskin Parchment paper)

Table 1
Dot Matrix with lower line of print emboldened
(Fade number: 0 = no fading ---- 7 = ink barely visible

Fluid	GP old	GP new	Resistall	pH start	pH finish	
80% IMS	2	0	3	8.0	5.5	
Steedman fix	2	0	3	7.5	5.5	
Steedman PFP	2	0	3	8.2	7.5	
Kaiserling 3	1	1	1	7.4	8.0	
Formalin 10%	0	0	0	7.9	5.0	
Formol-Saline	1	0	2	7.9	6.0	

Table 2
Indian Ink (fade number: 0 = no fading ---- 7 = barely visible)

Fluid	GP old	GP new	Resistall	pH start	pH finish	
80% IMS	0	0	0	8.0	5.5	
Steedman fix	0	0	0	7.5	5.5	
Steedman PFP	0	0	0	8.2	7.5	
Kaiserling 3	0	0	0	7.4	8.0	
Formalin 10%	0	0	0	7.9	5.0	
Formol-Saline	0	0	0	7.9	6.0	

Table 3
Edding pen (fade number: 0 = no fading ---- 7 = barely visible)

Fluid	GP old	GP new	Resistall	pH start	pH finish	
80% IMS	0	0	1	8.0	5.5	
Steedman fix	1	1	1	7.5	5.5	
Steedman PFP	0	0	0	8.2	7.5	
Kaiserling 3	1	1	1	7.4	8.0	
Formalin 10%	1	1	1	7.9	5.0	
Formol-Saline	0	1	0	7.9	8.0	

Conclusions from tests
More recent computer printer inks were unavailable to be tested with this batch of labels.
The reduction in pH of all of the fluids is significant.
Because the labels were together in each jar of fluid, it was not possible to tell which one might have lowered the pH although the presumed acidity of the Resistall may have been responsible. The dot matrix double line survived well throughout the test and should be still visible after 10 years in these fluids. The white Goatskin Parchment came out best of this test. Others (including A.Bentley) have found dot matrix printing to survive well but due to the paucity of such printers this result is unfortunately obsolete!
The Indian ink showed no fading at all throughout for each paper in any of the fluids.

The Edding pen showed the slightest fall-off in the same conditions, which was not due to its being less intense than Indian ink.
The results show that for the three papers tested, the fall-off in visibility was slight; new Goatskin Parchment came out the best overall and the Resistall only came off slightly worse with the dot matrix printer.
The above tests were carried out without specimens purely to test the ageing effect of the fluids and any allied effect on the papers and printings.

Other problems
There are several problems to take into account when testing inks and papers in jars of natural science specimens.
Contamination of the preserving fluid by the specimen: lipids that oxidise, natural pigments and many other organic compounds can leach into the preservative over years and can contribute to (non Indian-) ink and paper degradation especially if the contamination is due to lipid or fluid dilution through evaporation.
Lipids that leach out into preservatives will eventually oxidize into fatty acids and lower the pH of the fluid, endangering both the specimen and its label.
Contamination though decaying agents such as fungi are well-known, occurring in jars of fluids whose levels are low and where IMS or formaldehyde concentration levels have also fallen. Fungal hyphae have been noted in IMS at 30% strength and in 1% formaldehyde (2.5% formalin) and will start to produce a mixture of digestive enzymes as concentrations fall further.

Abrasion can occur through the movement of hard-bodies in jars: arthropod exoskeletons, claws, beaks, horns &c., rubbing against the label surface each time the jar is moved. For geological specimens the same applies to almost any type of specimen, especially grits, that can rub against the label.

Dense fluids such as oils, glycols including glycerol can soften some papers particularly if the fluid's pH level is below 4.5. Solvent clearing agents such as turpentine and methyl benzoate will cause a label to become semi-transparent and may cause it to embrittle over time.

Updates on printers and inks - the debate continues…
This information has been taken from Yale University's NH- COLL forum.
A M Snyder says that the Epson LQ870 (ESC P2) works well with Resistall and Tyvek labels and still holds up after 20 years, but also recommends a back-up label using 'Eternal' ink.
Zala *et al.* tested laser inks and labels, incoporating artificial ageing using microwaves. Some labels were sprayed with acrylic resin. This exercise was carried out over a 14 year period but with no specimens in the jars. Also, since the containers were small, the labels were in tight contact with the glass of the jar so that letter damage through abrasion in the jar, was inadvertently kept to a minimum.
Erik Ahlander, Sweden (pers. comm.) has used laser-printed labels at NRM, Stockholm originally sprayed with Letraset spray (cf. Letracote) but due to unavailability of this product uses a hot iron with the labels face down on a sheet of clean paper, to ensure ink fastness by thermal welding. He also noted three drawbacks:
1 Lipid/oil-rich fish, including eels and salmon may destroy the labels.
2 When sending loans (in poly-bags) the text could bond with the plastic bag surface, requiring the label to be folded and pencil-marked with the accession number.
3 When the printer is low on toner, the text becomes *(sic)* sensible (=more sensitive).
Andy Bentley (2004) of Kansas University and who manages fish collections, states that the solution lies in thermal transfer printer technology and spun-bound polyester media with a wax/resin combination ribbon which is sold by Alpha Systems in Virginia: www.alphasystemsva.com

Conclusions
This paper has outlined many varied techniques and possible panaceas to the ongoing problems of producing museum-quality labels for wet collections.
With ever-shrinking budgets and staff levels, in-depth research time is becoming increasingly dificult.
The main factor is that artificially ageing or accelerating the experiments will produce false parameters.
To bear this out, Oliver Crimmen (pers. comm.) has found that after 20 years some hitherto finely-(computer)-inked labels started to delaminate.
This rather leads onto to the thinking that a back-up accession number written in Indian Ink is still advisable.
Genuine (long-term) ageing seems to be the only real test for these printer inks and papers. By the time

they have outlasted this generation of conservators and curators IT will have advanced so much that these results (like my dot matrix printing) will have been long obsolete!

Suppliers of papers
Goatskin Parchment/s: Arjo Wiggins www.arjowigginsfinepapers.co.uk
Minimum order of £250 via Antalis www.antalis.co.uk
Wiggins Teape Ltd., Gateway House, Wade Road, Basingstoke RG24 8QN.
Cream or blue-white 500 sheets minimum order. Telephone 01256 724724.
Resistall (made by Byron, Westall Paper Company) and Tyvek: Preservation Equipment Ltd, (PEL), Vinces Road, Diss, Norfolk IP22 4HQ. www.preservationequipment.com Telephone 01379 647400.
Spun-bound polyester media with a wax/resin combination ribbon:
Alpha Systems in Virginia: www.alphasystemsva.com

References

Bentley, A C: 2004. Thermal transfer printers – applications in wet collections. *SPNHC Newsletter* **18** (2): 1-2 & 17-18.
Wheeler T A, Huber J T & Currie D C: 2001. *Label data standards for terrestrial arthropods.* Biological Survey of Canada (Terrestrial Arthropods). Ottawa, Canada.
Zala K, Pentcheff N D & Wetzer, R: 2005. Laser-printed labels in wet collections: will they hold up? *Collection Forum* **19** (1-2): 49-56.

Samples of White (new) Goatskin parchment, Resistall and Cream (old) Goatskin parchment' printed with dot matrix (normal and bold) and Indian ink and Edding profipen (pigment ink). Samples result after with-drawing from preserving fluids on 11th of May 2007, started on 6th of December 1999 and (Resistall) on 10th of February 2000.

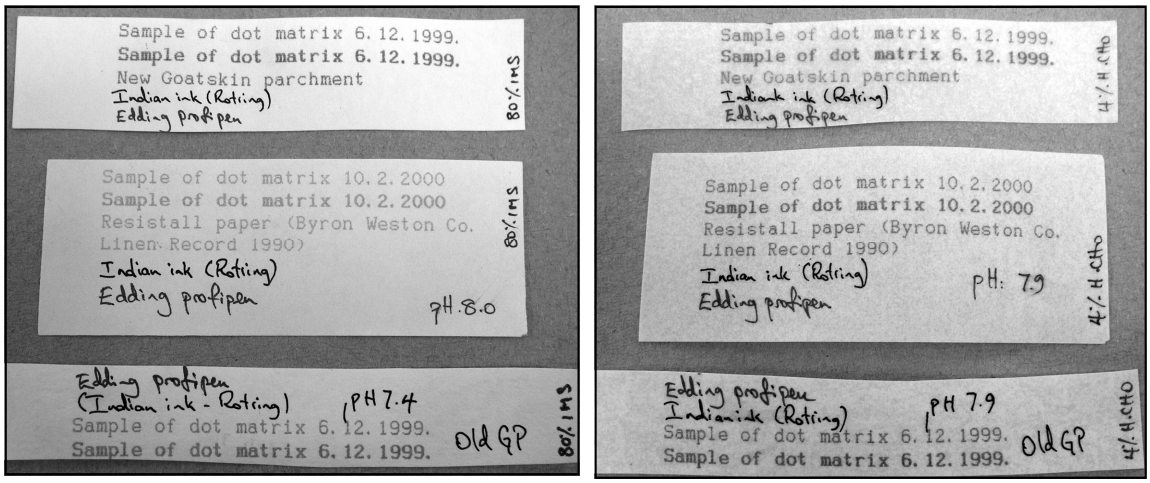


Fig 1. From preserving fluids 80% IMS (left) and 10% formalin (right)

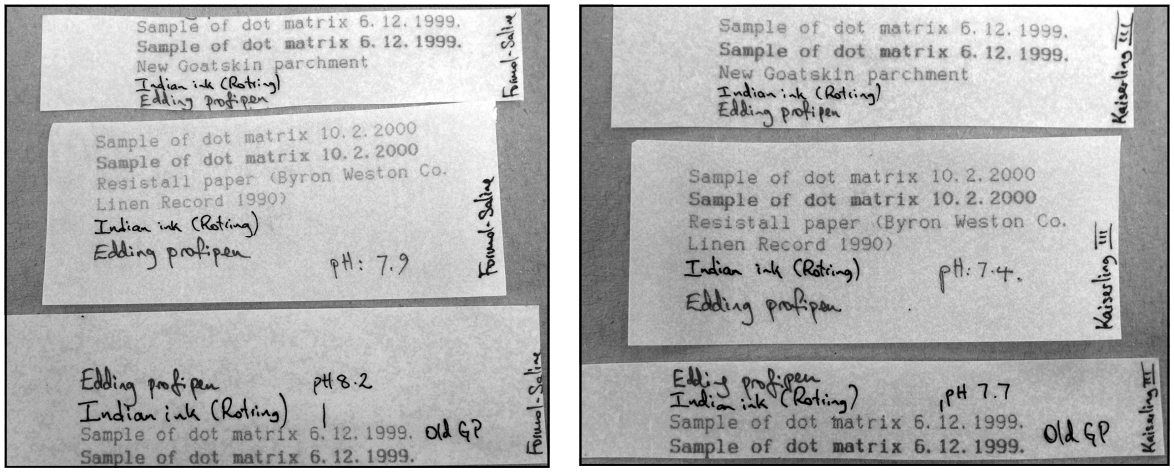


Fig 2. From preserving fluids 10% formol-saline (left) and Kaiserling III (right)

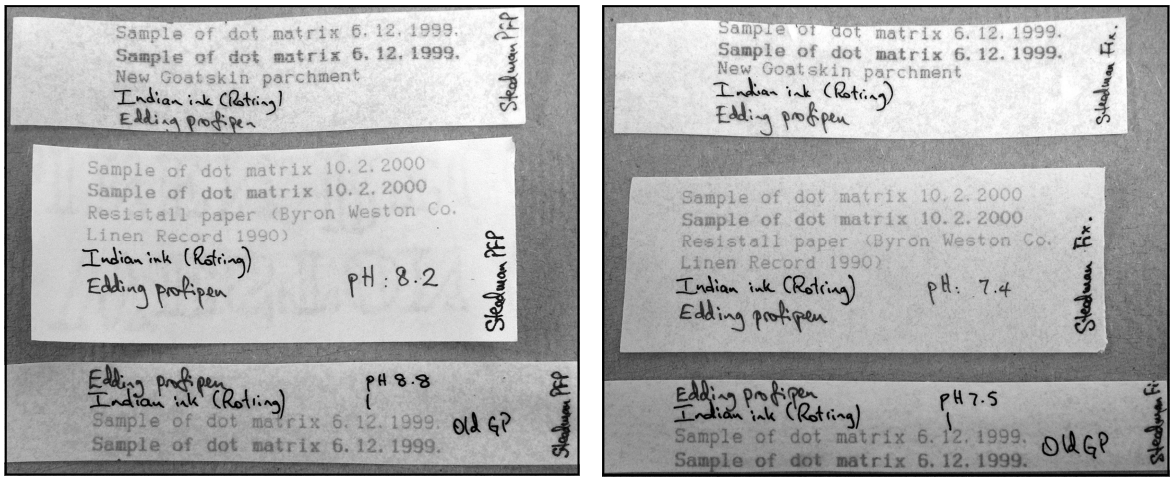


Fig 3. From preserving fluids Steedman's poft-fixation preservative and Steedmans's fixative.

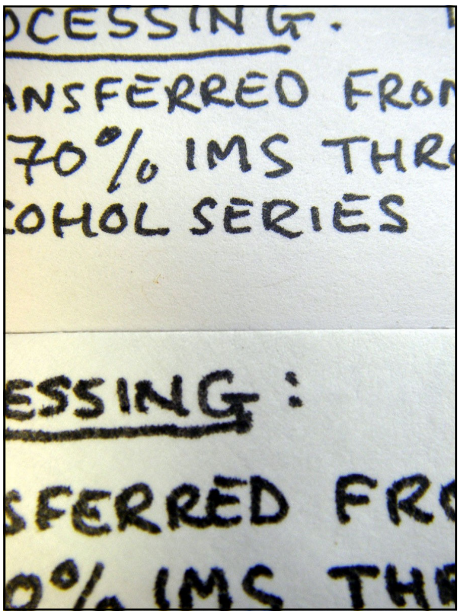


Fig 4. The fibrosity of Tyvek (lower) causes ink to leach out slightly into the paper giving a smudgy effect before immersion.

The Scottish Fossil Code

Collin MacFadyen, Scotish Natural Heritage (Colin.MacFayden@snh.gov.uk)

Abstract
After two years of preparation, involving a public consultation, the Scottish Fossil Code was launched by Michael Russell the Scottish Government Environment Minister in Cromarty on April 11th 2008. Probably the first national code of its kind, the Scottish Fossil Code aims primarily to help conserve the fossil heritage of Scotland.

Scotland has a remarkably rich geodiversity that spans nearly 3 billion years of Earth's history. Part of this 'Earth heritage' is the record of the development and evolution of life on Earth in the form of fossils. The fossil heritage exists in the natural environment, and importantly is also preserved in museums and private collections. It comprises an irreplaceable and finite resource that has uses in science, education and recreation. This element of Scotland's Earth heritage is vulnerable to abuse and damage and so requires a degree of safeguard and management to ensure its survival for future generations.

The Nature Conservation (Scotland) Act 2004 included provision for Scottish Natural Heritage to prepare the Scottish Fossil Code. The Code, produced with assistance from palaeontological researchers, land managers, collectors and others with an interest in Scotland's fossil heritage, provides advice on best practice in the collection, identification, conservation and storage of fossil specimens found in Scotland. The Code aims to enhance public interest in the fossil heritage of Scotland and promote responsible use of this resource for scientific, educational and recreational purposes.

Fossil collecting is an essential activity that provides the basic material and data for the science of palaeontology. It is hoped that following the Code will increase the personal interest and satisfaction that can be gained from forming a fossil collection; result in new finds to add to our record of past life and environments on planet Earth; and help conserve the fossil heritage of Scotland.

The essentials of the Scottish Fossil Code:

- **Seek permission** - *You are acting within the law if you obtain permission to extract, collect and retain fossils.*
- **Access responsibly** - *Consult the Scottish Outdoor Access Code prior to accessing land. Be aware that there are restrictions on access and collecting at some locations protected by statute.*
- **Collect responsibly** - *Exercise restraint in the amount collected and the equipment used. Be careful not to damage fossils and the fossil resource. Record details of both the location and the rocks from which fossils are collected.*
- **Seek advice** - *If you find an exceptional or unusual fossil do not try to extract it; but seek advice from an expert. Also seek help to identify fossils or dispose of an old collection.*
- **Label and look after** - *Collected specimens should be labelled and taken good care of.*
- **Donate** - *If you are considering donating a fossil or collection choose an Accredited museum, or one local to the collection area.*

The Code may be viewed and downloaded from www.snh.org.uk/fossilcode. Alternatively to receive a paper copy contact:

Scottish Natural Heritage
Publications Department
Battleby
Redgorton
Perth
PH1 3EW

T: 01738 444177
e: pubs@snh.gov.uk

A specimen of *Diplacanthus crassisimus* found at Hugh Miller's collecting locality in Cromarty, one of the specimens used in a workshop for pupils from Cromarty Primary School on the subject of fossils held on the occasion on the launch of the Scottish Fossil Code.

PRISM Fund supports conservation and purchase of Natural History Collections

Katherine Doyle, PRISM Fund Manager. (prism@mla.gov.uk)

It has long fallen to the natural history curator to battle against the deterioration of collections and dwindling acquisition budgets. However, there is help at hand. The Fund for the Preservation of Industrial and Scientific Material (PRISM Fund) exists to support public institutions and charitable trusts looking to conserve or add to their collections.

Since 1973 the PRISM Fund has been awarding grants to help save items of importance to our scientific or industrial heritage. All fields of science and industry are eligible, including natural history, medicine, photography, engineering and geology.

The PRISM Grant Fund, managed by the Museums, Libraries and Archives Council (MLA), has a pot of £250,000 each year to support the acquisition and conservation of this type of material. PRISM can offer funding of up to 50% of the project costs, up to a maximum of £20,000.

Applicants do not have to be accredited institutions but they do need to have charitable purposes and exist for the public benefit. The grant-aided item must be kept in the public domain and cared for properly. When making decisions about which projects to fund, priority is given to rare and unique objects.

Recent projects supported by PRISM include:

Plymouth City Museums & Art Gallery were recently awarded £1057 to mount or create study-skins for some currently frozen donations including a Mute Swan, a Mink and Polecat. As well as increasing awareness of indigenous fauna in the Plymouth area, this project will also create the potential for more research into local biodiversity (see Fig. 1)

Fig. 1. Skeleton of a mute swan mounted as in flight at Plymouth Museum. One of 9 birds in the foyer of the museum, prepared by Luke Williams, osteological preparator, in Staffordshire, with the support from PRISM funding. Disarticulated mammals were also prepared as part of the funding.

Torquay Museum have recently been awarded £5712 for the conservation of the palaeontology collection from Kent's Cavern. This essential work will secure the future of the collection; enabling researchers to use this valuable asset from the Pleistocene period for many years to come.

Sunderland Museum & Winter Gardens have been awarded £3500 for the acquisition of the John Bell Fossil Fish Collection. This collection of Permian fossil fish from Marl Slates, Durham includes many rare specimens currently not represented in the British Museums.

Oxford University of Natural History have been awarded £20,000 for the conservation of the Fluid-Preserved Vertebrate Collection. This extensive project seeks to stabilise the collection – important as a record of the history of preparation and preservation of specimens and the history of teaching science – as well as creating a new database detailing conservation treatments and where known, the original locality of the specimens.

If you are planning a project that may benefit from PRISM do not hesitate to get in touch. For further information please contact Katherine Doyle, PRISM Fund Manager, on 020 7273 1446; email: prism@mla.gov.uk. Guidance notes, application forms, and the latest annual report are available on the MLA website at http://www.mla.gov.uk/website/aboutus/grants/PRISM_Grant_Fund

A Guide to Insect Collections in the British Isles.

Jeanne Robinson, Kelvingrove Museum and Art Gallery

Introduction

The aim of this very brief guide is to give an overview of insect collections – why we have them and how we use them. Whether you are an amateur entomologist with an established collection, a student wanting to prepare specimens from a project, an artist who wants to use insects for inspiration, or are just curious, we hope there is something useful for you and pointers to find out more.

There are around 10 million insect species in the world- in the British Isles alone there are more than 25,000 species. As well as being numerous, insects are the most diverse and successful terrestrial animals on our planet. Their compact size and relatively short lives make them ideal for study and give us vital insights to the world around us. Insect collections provide the foundation for these insights.

People have been making insect collections since the 17th century. Some of these earliest specimens are housed in London's Natural History Museum and are still in surprisingly good condition. Appropriate care and housing are vital. Specimens that are well cared for have survived for over 300 years. The oldest collections are very important both scientifically and historically.

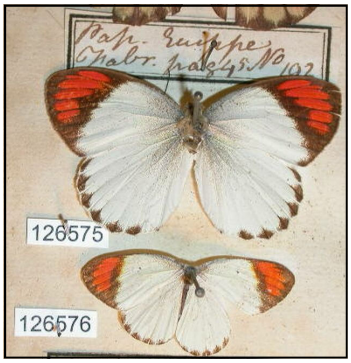


Fig 1. Specimens collected in the 18th Century from the Hunter Collection, Huntarian Museum, Glasgow.

Fig 2. Specimens collected in the 18th Century from the Hunter Collection, Huntarian Museum, Glasgow.

Scope of this guide

1. What are insect collections used for?
2. What is in an insect collection?
3. How are collections established and expanded?
4. How to donate, bequeath or sell your collection
5. Enhancing the value of a collection
6. Insect collections with specialist staff
7. What do the specialists responsible for insect collections do?
8. How to access insect collections
9. Want to work with insect collections?
10. Contact details for insect collections with specialist staff
11. Other useful contacts
12. Useful references
13. What is the ICMG?
14. How you can contribute to this guide

1. What are insect collections used for?

Work on preserved biological specimens held in museum collections underpins all aspects of biological science including anatomy, biodiversity, bioinformatics, biotechnology, conservation biology and evolution. In addition to their importance to the scientific community, such collections are also an excellent tool

for engaging with the wider public.

Uses of insect collections include:

a. Insect identification
b. Repository for type and other voucher specimens
c. Taxonomy and systematics research
d. Production of identification guides
e. Studying changes in species distribution over time
f. Collections-based training and education
g. Public displays
h. Primary sources for artists
i. Resource for medical and forensic work

a. *Insect identification*

Accurate species identification is of paramount importance; it underpins biodiversity, taxonomic, evolutionary, ecological, genetic, behavioural and physiological research. Without knowing the species name of an insect, you can't access the information already known about it. If insects are jeopardising health, crops, livestock or buildings we need to know what they are to combat them. Conversely, if they are eating pests, pollinating certain plants or helping recycle waste we want to know how to encourage them. The sheer number of insect species makes identification difficult at best and in many cases impossible without reference to extensive collections. Superficially similar insects may belong to different species, have different habits, distribution and economic importance. This is why accurate identification is of paramount impor-

Fig. 3 and 4. Entomologists identifying insects at the National Museums Scotland (left) and the National Museums Liverpool

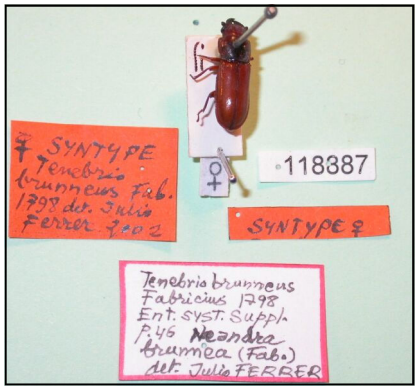
tance. Identification guides are not available for many insect groups, particularly less popular ones. Those that are available are not always user-friendly and still require reference to a collection for comparisons.

b. *Repository for type and other voucher specimens*

Type and other voucher specimens are very important parts of an insect collection. Accessible voucher specimens are critical for accurate identification and subsequent verification of a species. Type specimens are those that were first used to describe a species. Each new species is allocated a unique name. The types show us what is unique to the organisms of that name, and allow us to distinguish them from similar species. They are the reference points for application of the name. Sometimes on closer examination, a supposedly 'new' species is found to be part of an existing species and is not distinct enough to warrant its own species name. Further study may show that what was once thought to be a single species is actually a group of closely related species. In this case new names for each additional species in the group are required. There is always a need for subsequent researchers to re-examine types to know which name applies to which species.

Other voucher specimens are those that allow reliable verification of the identity of species used in biological studies or ecological surveys, particularly published research work. The preservation of voucher specimens is important for other researchers to refer to. This is of importance when the identity of the study or-

ganism is suspect or needs to be clarified in the light of taxonomic advances. The people who conduct biological and ecological studies are not necessarily insect specialists so there is a risk of misidentification.

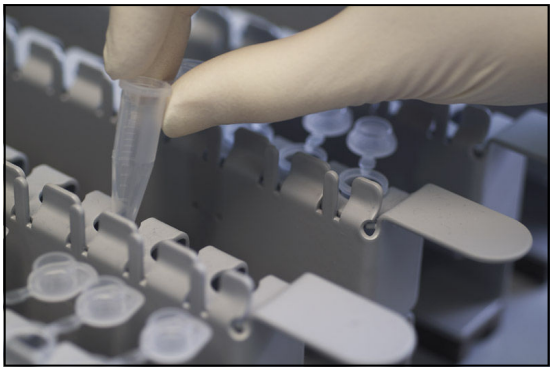


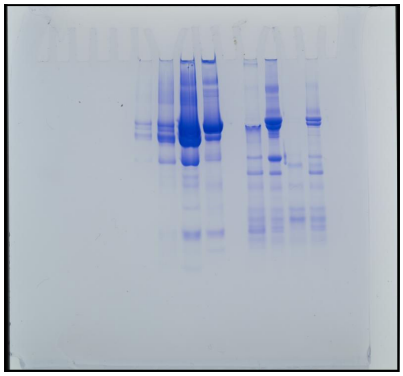
Figures 5 and 6. Type specimens from Manchester Museum (left) and the Hunterian Museum, Glasgow (right).

c. *Taxonomy and systematics*

Insect collections are a primary resource for taxonomy because they are used in the delimitation and description of new species. They can also be used to investigate the evolution and classification of insects. Such research is still necessary for most insect groups. The staff of an institution responsible for a collection or external researchers may carry out the work.

Modern scientific advances, including 'gene-sequencing', DNA amplification methods and analysis of cuticular hydrocarbons (CHCs) have added another dimension to our collections. The DNA or CHCs from existing specimens can be analysed to enhance our knowledge of taxonomy, systematics and evolutionary relationships (phylogeny). The suitability of specimens for analysis is highly dependent on the nature of the killing agents and preservatives they have been exposed to and the age of specimens. CHCs may be adversely affected by long-term storage in spirit and by certain preparatory chemicals. DNA degrades over time and certain preparatory chemicals damage it. However, as techniques develop a greater variety of older specimens can be analysed, so historical material will become more valuable for such studies. Insect collection managers must consider preserving insect specimens in ways which minimise changes in order to maximise their potential for future analysis. A piece of a specimen must be removed and ground up for genetic analysis. For CHC analysis, the specimens are washed using non-destructive chemicals and the resulting solution is analysed. Traditional taxonomic work sometimes requires another kind of destructive sampling. An insect may need to be dissected to examine internal features, but the dissected parts are retained with the specimen for subsequent examination. Museums have policies on destructive sampling in order to define what can be done to specimens for gene-sequencing and potentially other kinds of analysis.





Figs 7 and 8. Molecular analysis in action - Crown Copyright, Central Science Laboratory, 2008.

d. *Production of identification guides*
Specimens in collections are used to devise, update or improve identification guides. The guides are best used in conjunction with a reference collection to identify insects but they can be a useful starting point for people who cannot easily access suitable collections..

e. *Studying species distribution*
Records and data from specimens and field research have enormous value for building knowledge of life on our planet. Studies of ecology and distribution are required for effective conservation of species and their habitats. Many of these studies depend on museum collections. Reliable data from museum specimens can be used to compile species checklists and distribution maps for locations around the world. Because collections have been built up over a long period they can provide much more data than could be obtained in the course of a single field study. These data give a baseline to investigate changes in animal communities in response to human activity and environmental fluctuations over time.

f. *Collections-based training and education*
Most museums have active education programmes targeted at a wide range of age groups to encourage people to engage more with the natural world. In addition to enthusing the wider public, insect collections are used to train tomorrow's entomologists (insect specialists). This may be through schools, universities or more vocational organisations.

Examples:
CoBiD-UREKA - An international summer research programme for undergraduate students in Dublin, funded by Science Foundation Ireland [www.ucd.ie/ureka]
IDQs – Identification qualifications. Accreditation of identification skills through the Natural History Museum, London. [www.nhm.ac.uk]
BTCV Natural talent scheme. Apprenticeships that develop field and identification skills in numerous disciplines including Entomology (Scotland and Northern Ireland only) [http://www2.btcv.org.uk/display/naturaltalent]

'If you are interested in working with insect collections please see **Section 9** below.

Fig 9. BTCV apprentice Coleopterist and mentor, Glasgow Museums

g. *Public displays*
Insects that are well displayed allow the public to explore many key biological themes without requiring a vast display space in which to do so. They are particularly useful for illustrating biodiversity, form and function, disease epidemiology and pest biology.

h. *Primary sources for artists*
Collections give artists access to much more of the diversity of insect form and function than would otherwise be easily available; they often capture the imagination of artists. Specimens are sourced by artists to inspire them in their diverse endeavours. See **Section 8** to find out how to access insect collections.

i. *Resource for medical and forensic work*
Preserved specimens are sometimes lent out to clinical psychologists. They are a useful tool for helping people to come to terms with 'entomophobia' (fear of insects) and museum entomologists are called upon in cases of delusory parasitosis and certain aspects of forensic investigations. See **Section 8** to find out how to access insect collections.

2. What is in an insect collection?
Although there are collections dating back to the 17th century, few institutions are lucky enough to have material from that time. By the end of the 18th century the benefits of preserved collections of specimens with associated data on where and when they were collected had come to be appreciated. This approach forms the basis of current preservation methods. The Victorians were voracious collectors of natural his-

tory material; consequently British museums are home to a lot of material amassed by amateur entomologists in the 19th century. More recent specimens come directly from research projects, field surveys and enquiries, but collections made by amateur and professional entomologists are still important.

Figs. 10 and 11. Jewel beetles (left) and African Butterflies (right) from Manchester Museum and Glasgow Museums respectively.

An insect collection will typically comprise dried insects mounted on pins (either directly or staged on a card on the pin). It may also include:

- Dried insects stored in paper envelopes e.g. lepidoptera (butterflies and moths)
- Insects stored in alcohol
- Microscope slide preparations of whole or parts of insects
- Examples of insect labour i.e. nests, leaf-mines, galls, wood bored by insects, dung balls etc….
- Archives and associated library
- Historical insect collecting equipment

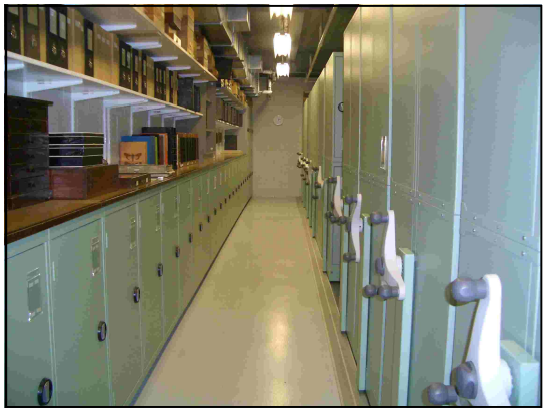
Figs. 12 and 13. Giant earwigs on card and ladybird slide (Manchester Museum).

Insect collections are predominantly comprised of pinned and card mounted specimens and specimens in spirit. These may be housed in their original wooden entomological cabinets or in modern alternatives. Pinned insects are usually kept in shallow, glass-lidded drawers within wooden or metal cabinets. Some collections are housed in wooden store boxes. In either case they are lined with cork or plastic foam into which the pins are stuck. Insect collections are generally arranged taxonomically. This means that closely related species are kept together, so even when a collection is not fully catalogued, specimens can be located with ease and readily compared with similar ones.

3. Establishment and expansion of insect collections
Collections are established and expand by a number of means.

- *Fieldwork* – Museum staff contribute specimens directly to the collection.
- *Donation* – Owners of collections (private and public) donate or bequeath material. Researchers who have amassed material donate collections on completion of their project/s.
- *Enquiries* – Museums receive specimens from the public for identification purposes, many of which are deposited in collections.
- *Swaps* – Exchanges may be made between individuals or institutions to enhance collections and fill gaps.

- *Purchase* - Collections sometimes become available through auction or private sale. Museums generally have very limited acquisitions budgets and competition for grants is very high.



Figs 14 and 15. Entomology cabinets, National Museums of Scotland (left) National Museums Liverpool

Figs 16 and 17. Fieldwork in progress with Malaise trap (top left) and dipping net (top right) – Glasgow Museums.

Due to the huge number of insect species, there are always gaps in entomology collections. No single museum could possibly contain examples of every known insect. Museums must take into consideration the initial expense of transporting, pest checking/cleaning, the subsequent housing and long-term curation of each acquisition of specimens. Storage space comes with a cost and is often at a premium and each acquisition must be carefully justified. Collections that enhance existing holdings and have good research potential (historic or scientific) are likely to be favoured.

4. If you wish to donate, bequeath or sell your collection

There are hundreds of institutions/museums that have natural history collections and many of these have at least a few insect specimens but only a few museums in Great Britain and Ireland have designated staff for entomological collections. Such specialists provide the best care for, access to and interpretation of insect collections.

If you want to know which collections have see **Section 6**.

Unfortunately, storage space, staff and funding are not infinite. Consequently, the institution that you may

prefer your collection to go to may not be able accept it. If your chosen institution is unable to take some or any of your collection, you may wish to donate it somewhere else. The museum you have approached may be able to advise you of other suitable places to try. Institutions with a general natural history curator will still be able to offer a good standard of care for, access to and security for your specimens. If several institutions are interested; visiting their collections and meeting the staff who care for them may help inform your choice.

The Insect Collection Managers Group (ICMG) or the Natural Sciences Collections Association (NatSCA) can advise you and help you find a suitable home your collection. See **Section 11** for their contact details

There are ways in which you can make your collection more appealing to potential custodians. See **Section 5** for further details.

Please note, an institution will generally require proof that specimens have been acquired legally where applicable. This could be proof of purchase where ownership may be disputed. It may be licences/permits for specimens from protected sites or of protected species (collecting and export permits) that have been collected in more recent years. Copies of these should be made available to your chosen institution.

5. Enhancing the value of a collection
The value of individual specimens and small collections can be greatly enhanced by organising them in a well-curated collection. As an individual collector or custodian of a collection, you can also make your collection more appealing in the following ways.

The physical condition of the specimens
Protect your collection from physical harm. Physical damage, exposure to light (particularly sunlight), moisture or pests may destroy or reduce the quality of your specimens. Keeping all specimens in well-sealed receptacle, storing them in a cool dark place and checking them periodically for pest damage is advisable. Specimens stored in alcohol should be regularly topped up to protect from damage if the spirit evaporates.

For more specific advice on collection housing and care contact NatSCA or ICMG - see **Section 11** for their contact details. Alternatively you could contact an entomology curator/collections manager near you - see **Section 10** for details.

The quality of associated data
A collection has little value unless each insect is individually and accurately labeled. The most important pieces of information are where and when a specimen was found and who collected it. If someone has identified the specimen, the name of the determiner and the date at which the determination was carried out should be recorded on a separate label. If the specimen is a type, cited in a publication or figured (pictured in a publication), a label should indicate this. Details of biological associations, such as the host an insect is associated with, details of the habitat/microhabitat in which it is found and any added notes about behaviour are potentially very useful. All data that you have about a specimen should be on a label(s) with it. Supplementary notes in a field notebook or diary further enhance the interest and utility of a collection. Never rely on memory or a system that links primary data to specimens via a numbering system. Many collections are rendered useless by the subsequent loss of the associated catalogue.

Ideally you should have a maximum of six lines per label. If you are producing labels on a computer, the font Times New Roman, size3.5 or 4 point is recommended.

Label 1**:** Data label - Who, what, where, when?

The following information should be included
COUNTRY: Region
Locality, altitude
GPS reading/Map co-ordinates
Date(s) collected
How collected/ or on new label (see below)
Collectors
Label 2: Habitat/Trap data label

Example:

BOLIVIA: Dept. Santa Cruz
Comorapa, 1841m alt.
S17º55'59" W64º30'17"
29.xii.2004 coll. Mann, D&

Include information on habitat information, method of capture or biological associations etc….

Examples:

Reared from pupae on dock (*Rumex* sp.) leaf
Emerged 26.vii.2007

Inter-Andean dry forest
open habitat, sandy soil
ex. cattle dung on road verge

Label 3: Determination label

Details to include:
Species name (author) in italics or underlined
Determiner/Identifier
Date of determination

Example:

L*ucanus cervus*
(Linnaeus, 1758) ♂
Det: D. J. Mann, ix.2007

An institution that takes on a new collection is likely to incorporate it into their existing one because of the benefits this brings. If each specimen is fully labelled it can be easily combined with the existing collection whilst retaining its data or provenance. If you have lent material to an expert for identification your labels will prevent any mix-ups with the experts own material.

The quality of materials
It is important to use the right materials in preparing specimens. Label data should ideally be recorded using good quality permanent ink or laser printed on acid-free paper or card. The ink will need to be alcohol-proof for use with specimens in spirit. This will help insure that the associated data lasts as long as the specimen itself. Good quality stainless steel entomology pins should be used for dried, pinned specimens, as these have the best longevity. Specimens mounted on cards should be on acid-free card and water-soluble glue and pinned with stainless steel pins. Specimens stored in spirit need containers with good seals to help reduce evaporation. Additions of small quantities of glycerol can also help reduce evaporation. For information on the best equipment or current suppliers contact ICMG or an entomology curator/collections manager near you.

For detailed advice on specimen preparation see specialist publications, for example the handbooks produced by the Royal Entomological Society and the Amateur Entomologist's Society or Carter et al (1998). See **Section 12** 'for details of useful references.

Multiple specimens
Like humans every individual insect is unique. Individuals can look different because of their sex, where they come from or due to environmental differences. Consequently, having one perfect specimen of each species would be of limited use as a reference tool and for research. For an insect collection to be most useful multiple specimens of each species are required to show the full variety within that species. Series of specimens should not be harvested indiscriminately; all collectors should follow Joint Committee for the Conservation of British Invertebrates (JCCBI) code of conduct. For further details visit http://www.buglife.org.uk/NR/rdonlyres/C78F6DB3-7C26-4E92-A185-B71BCEA81156/0/CodeofConduct.pdf or http://www.benhs.org.uk/code.html.

Archives and historical information
A bibliography or archive associated with the collection, biographical information about the collector/s and their collecting activities will be of interest to the wider community that will use the collection.
The insect groups covered
The most popular and commonly collected insects are butterflies, macro-moths and the larger beetles. Less

commonly collected groups will generally be in greater demand amongst institutions with insect collections.

6. Insect collections with specialist staff

There are hundreds of institutions/museums that have natural history collections and many of them have at least a few insect specimens. However, only a few such institutes in Great Britain and Ireland have dedicated entomologists who oversee the insect collections. These specialists go by a number of names, most commonly entomology curators or collection managers. Such specialists provide the best care for, access to and interpretation of insect collections. The following institutions have designated entomologists that care for insect collections (see **Section 10** for contact details)

Fig 18. Multiple specimens of the Swallowtail butterfly - Papilio machaon from the Manley Collection, Glasgow Museums.

Fig 19. Leaf insects (Manchester museum)

Central Science Laboratory, York
Glasgow Museums, Culture and Sport Glasgow
Oxford University Museum of Natural History
Hunterian Museum, Glasgow University
Manchester Museum
Natural History Museum, London
National Museums Liverpool
National Museum of Ireland, Dublin
National Museum of Scotland, Edinburgh
National Museum of Wales, Cardiff
University Museum of Zoology, Cambridge
Ulster Museum

7. What do the specialists responsible for insect collections do?

Curating an insect collection is a fascinating and important job. In general terms the curator facilitates all the activities that insect collections are used for (see section 1) and ensures the collections are developed and cared for in the best possible way. In larger institutions, some of these tasks may be split between a number of staff. In smaller institutions, the curator is likely to be directly involved in several of them.

Entomology curators assess new material offered to their collection for quality and compatibility with their existing holdings. They assess the condition of newly acquired material to determine if it needs treatment before being incorporated in the existing collection. The curators decide how best to house material within the collection, to ensure long-term preservation and to facilitate access. They monitor the collection to ensure its condition doesn't deteriorate and treat or repair specimens as required. They oversee the cataloguing of the collection. They research it to enhance its scientific and historical value and facilitate the access by external researchers to do the same. They promote the collection amongst potentially interested parties and the wider public, such as other museums, research institutions, conservation agencies, natural history socie-

ties, education staff, artists etc. They provide consultancy and often training in all aspects of entomology such as collecting, preservation, biology and conservation. They provide an insect identification and enquiry service. Entomology curators undertake fieldwork for research projects, collections enhancement (e.g. missing species/groups) and to generate data for biological recording. They support students involved in collections-based training and work on displays and provide interpretation for display material.

If you would like to know more about working with entomology collections, see Section 9.

8. Accessing insect collections

A small proportion of museums' insect holdings are on public display at any one time. Insect collections are predominantly a research tool and are kept in accessible stores. Collections may be housed in the museums itself. In recent years due to the cost and/or practicalities of storage, collections have been moved out of the buildings housing public galleries to dedicated storage facilities. Wherever they are stored, these museum collections are best accessed by making an appointment with a staff member responsible for them, most commonly the entomology curator or collections manager. If in doubt, the main switchboard of the relevant institution should be able to advise you who to speak to. Contact details of insect collections supervised by a dedicated entomologist are provided in **Section 10**.

In addition to visiting a collection in person, museums can arrange loans of material that are in good enough condition for transportation / posting. This strategy is generally exploited by international researchers who need to access material. Material may also be borrowed for others reasons such as displays, art projects or psychology sessions. To discuss the possibility of borrowing material you should contact the member of staff responsible for the collections.

Many entomology collections are trying to make their collections more accessible on the internet with customised databases although this is very much work in progress. The collections are large and the task huge.

Here are a few examples:

The Cockayne collection: British & Irish butterflies and moths part 1: Butterflies
http://www.nhm.ac.uk/research-curation/projects/cockayne/

Coleoptera Collection and Card Index
http://www.nhm.ac.uk/research-curation/projects/coleoptera/

The Wallace collection
http://www.nhm.ac.uk/nature-online/collections-at-the-museum/wallace-collection/themeslist.jsp

O.U.M.N.H Entomology database
http://www.oum.ox.ac.uk/database/entom/moreinfo/collects.htm

The Hunterian Museum, Glasgow – General search
http://www.huntsearch.gla.ac.uk/

9. Want to work with insect collections?

If you want paid work in a museum as a curator or collections manager you will need a degree in a relevant discipline and usually a postgraduate museum qualification. It is generally a strong advantage to have been a museum volunteer. The Museums Association offers excellent guidance on starting out and developing a career working with museum collections (also see '*Contact details*') http://www.museumsassociation.org/. Leicester University teaches museum studies with potential for specialising in Natural History http://www.le.ac.uk/museumstudies/; as does Newcastle University http://www.ncl.ac.uk/sacs/postgrad/icchs/gallery.htm

Also see **Section 1. f** *'Collections-based training'*
If you wish to volunteer you may have to approach a number of institutions. Remember that smaller institutions may not seem as glamorous but may be better placed to take you on and to offer a more varied experi-

ence. Larger institutions often have a volunteer co-ordinator for you to arrange your placement through. If not, the curator/collections manager of the relevant collection should be able to advise you. You may wish to advertise your willingness to work through http://www.natsca.org/ or the ICMG.
Be warned: much of the work can be repetitive; sample sorting, labelling and curatorial duties are not all glamorous!
Jobs are advertised at
http://www.natsca.org/
http://www.museumjobs.com/
www.le.ac.uk/museumstudies/jobs

10. Contact details

Central Science Laboratory, York
Sand Hutton,
York,
UK,
YO41 1LZ
Tel: +44 (0)1904 462000
Fax: +44 (0)1904 462111
E-mail: info@csl.gov.uk
Web: www.csl.gov.uk

Hope Entomological Collections
Oxford University Museum of Natural History,
Parks Road,
Oxford, UK,
OX1 3PW
Tel: +44 (0)1865 272950
Fax: +44 (0)1865 272970
E-mail: entomology@oum.ox.ac.uk

Manchester Museum
Manchester University,
Oxford Road,
Manchester, UK,
M13 9PL
Tel: +44 (0)161 275 2634
Fax: +44 (0)161 275 2676
E-mail: museum@manchester.ac.uk
Web: www.museum.manchester.ac.uk

National Museums Liverpool
World Museum Liverpool,
William Brown Street,
Liverpool, UK,
L3 8EN
Tel: +44 (0)151 478 4393
Web: www.liverpoolmuseums.org.uk

Glasgow Museums
200 Woodhead Road,
South Nitshill Industrial Estate,
Glasgow,
Scotland, UK,
G53 7NN
Tel: +44 (0) 141 276 9300
Text Phone : +44 (0) 141 276 9428
Fax : +44 (0) 141 276 9305
E-mail : museums@csglasgow.org
Web: www.glasgowmuseums.com

Hunterian Museum (Zoology), Glasgow
Graham Kerr Building, University of Glasgow, Glasgow, Scotland, UK,
G12 8QQ
Tel: + 44(0)141 330 2194
Fax: + 44(0)141 330 5971
Web: www.hunterian.gla.ac.uk

Natural History Museum
Entomology Dept.,
Cromwell Road,
London, UK,
SW7 5BD
Tel: +44 (0)207 9425000 (main switchboard)
Website: www.nhm.ac.uk

National Museum of Ireland
Marketing Department,
National Museum of Ireland,
Collins Barracks,
Benburb Street,
Dublin 7, Ireland.
Tel: +353 1 6777444
Tel LoCall: 1890 687 386
Tel LoCall: 1890 MUSEUM
Fax: +353 1 6777450
Email: marketing@museum.ie
Web: www.museum.ie

National Museum of Scotland
Entomology Dept.,
Chambers Street,
Edinburgh,
Scotland, UK,
EH1 1JF
Tel: +44 (0)131 247 4422 (main switchboard)
Web: www.nms.ac.uk

National Museum of Wales
Cathays Park,
Cardiff,
Wales, UK,
CF10 3NP
Tel: +44 (0) 29 2039 7951
Web: www.museumwales.ac.uk

Ulster Museum
Ulster Folk and Transport Museum,
Cultra, Holywood,
County Down,
Ireland,
BT18 0EU
Tel: +44 (0)28 9042 8428
Fax: +44 (0)28 9042 8728
Web: www.ulstermuseum.org.uk

University Museum of Zoology, Cambridge
Downing Street,
Cambridge, UK,
CB2 3EJ
Tel: +44 (0)1223 336650
Fax: +44 (0)1223 336679
E-mail: umzc@zoo.cam.ac.uk
Web: www.zoo.cam.ac.uk/museum/

11. Useful organisations

The Amateur Entomologists' Society (The AES)

PO Box 8774, London, UK, SW7 5ZG

E-mail: contact@amentsoc.org

Website: http://www.amentsoc.org/aboutus.htm

The British Entomological and Natural History Society
The Secretary, c/o The Pelham-Clinton Building, Dinton Pastures Country Park, Davis Street, Hurst, Reading, Berkshire, U.K, RG10 0TH
Website: http://www.benhs.org.uk

BTCV (British Trust for Conservation Volunteers) Natural Talent Scheme Natural Talent, BTCV Scotland, Balallan House, 24 Allan Park, Stirling, UK,
FK8 2QG
Tel: +44 (0)1786 479 697
E-mail: Natural-Talent@btcv.org.uk
Web: http://www2.btcv.org.uk/display/naturaltalent
ICMG (the Insect Collection Managers Group) – Web address?

Leicester University
Department of Museum Studies, University of Leicester, 105 Princess Road East, Leicester, UK, LE1 7LG
Tel: +44(0)116 252 3963
Fax: 0116 252 3960
E-mail: museum.studies@leicester.ac.uk
Web: http://www.le.ac.uk/museumstudies/

The Museums Association
Museums Association, 24 Calvin Street, London, UK, E1 6NW
E-mail: info@museumsassociation.org
Web: http://www.museumsassociation.org/

Museum Jobs
Latitude 56 Ltd, Lunga Estate, Argyll, Scotland, UK, PA31 8QR

Paradise at Kendal Museum

Carol Davies, Natural History Curator, Kendal Museum

Introduction

Kendal Museum has quite wonderful collections of Victorian taxidermy. These collections resulted from the generous donations of Victorian and Edwardian benefactors to the museum, people who themselves were amongst the foremost natural historians of the day and active in the local natural history societies. Indeed the museum was founded by the Kendal Natural History Society in 1835 and built up with donations of individual collections and records by this and its successor societies during the rest of the century, donations which form the basis of the museum collection as we know it today.

The Kendal Museum support group has been a great help in my work with the collections and we have been able to work on small projects leading to new displays. Many of the support group members are inspirational people with detailed specialist interests in the field of natural history. In times of recent uncertainty one of the ways in which we can maintain an active cataloguing programme to promote the collections is to draw on this area of support.

Paradise

One such project has been the recent display together with the cataloguing and conservation of three magnificent cases of Birds of Paradise. These cases are attributed to H. Murray and Son and are part of our large collection of this celebrated late 19th century/early 20th century taxidermist.

Fig 1. Case 1 displaying 7 birds of paradise.

In each of the three cases, the birds are arranged in a diorama setting. Although these are beautiful to look at, there were no names for the individual birds, the original records, if they ever existed, having been separated from the cases. Our first task was to name them all.

I am indebted to two members of the current Kendal Natural History Society who together, over several months, researched a full catalogue for these and several other cases of exotic birds.

My next job was to move/conserve and clean the cases for their new position in our World Wildlife Gallery. Our plan was to display the cases near the main Australian dioramas together with an information board. My intention is that this board can 'standalone' so that this display could have the potential to move out from the museum and form a small temporary display serving to advertise the museum collections if needed.

Fig 2. Close up of Raggiana Bird of Paradise *Paradisanna raggiana in* Case 2.

Finally we decided to produce a line drawing of each case naming the specimens, using the artistic talents of another of our supporters. As well as making attractive information sheets for the

public, these have already proved useful for school projects!

Conclusion

With each new project the promotion and celebration of the collections is very much in our minds, as we endeavour to appeal to a greater number of visitors.

We await the joinery needed to build the shelves on which the cases will finally be housed and bring together all the component parts but you will agree that these magnificent cases deserve to be shown off.

Acknowledgements

Mrs Judith Robinson: For help, advice and support for each stage of this new display and who, together with the help of Mr Gordon Clark researched the final catalogue for the Birds of Paradise.

Mrs Sarah Harvey: For the meticulous and quite beautiful line drawings used in the information sheets

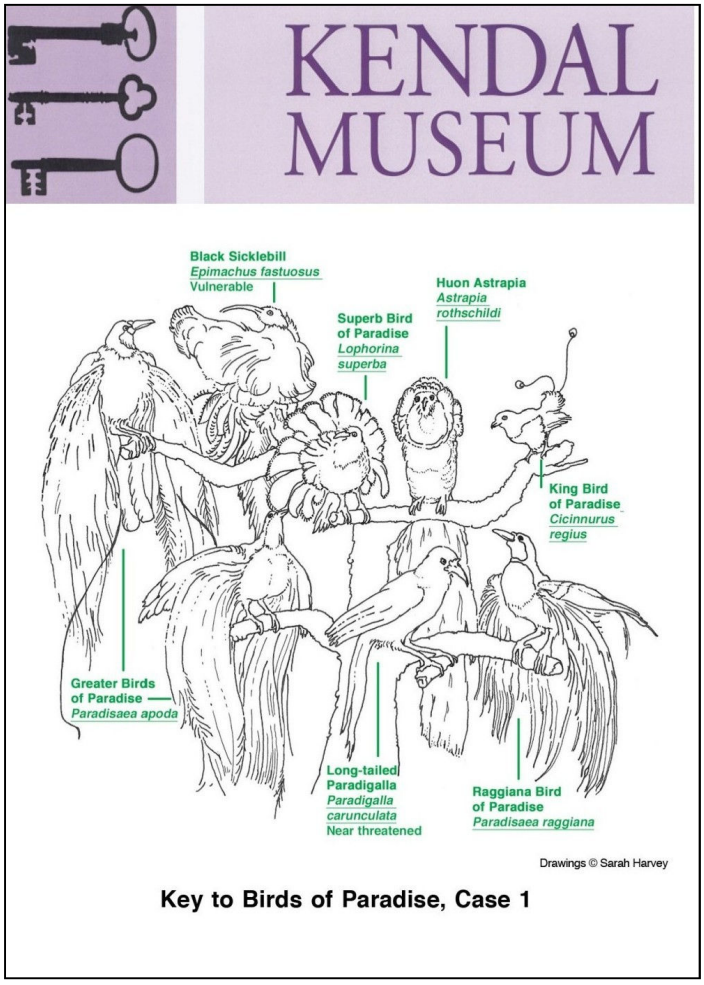


Fig 3. An example of one of the information sheets to accompany the newly revamped cases. Each sheet was specific to its case.

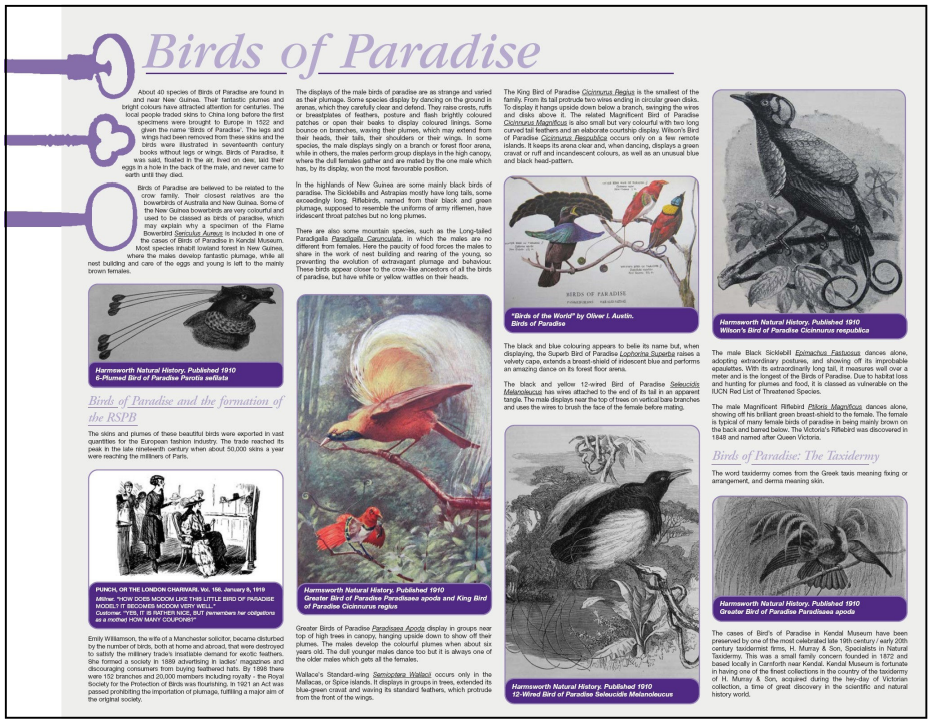


Fig 4. The standalone board with detailed information about the history of birds of paradise and why they were collected.

NEWS

Notices, Adverts & Meetings

SPNHC is coming to Europe!

SPNHC
BRIDGING CONTINENTS 2009

It is with great pleasure that the National Museum of Natural History Naturalis and the Leiden University Medical Center LUMC announce that for the second time in history the Society for the Preservation of Natural History Collections is coming to Europe.

Four years after the first conference in London, Leiden will bring together curators and managers in natural history collections from different continents.

The LUMC and Naturalis will host the 24th annual meeting of SPNHC:

Bridging Continents

New Initiatives and Perspectives in Natural History Collections

6 - 11 July 2009, Leiden, The Netherlands

Bridging Continents presents new, large-scaled infrastructure projects in natural history collections, the state-of-art in collection care and best practice, the latest on digitization of collections and much more.

Join us to make it the largest event in Europe dedicated to natural history collection preservation, management, and strategies. You will meet old friends and new colleagues from natural history museums all over world. Share your ideas and experiences with them.

We welcome you to the charming city of Leiden, university town since 1575, birthplace of Rembrandt and hometown of the Dutch Constitution. Discover a world of canals and bridges, of tradition and innovation, of making things possible. Just 15 minutes from Schiphol International Airport and 30 minutes from Amsterdam. (**www.spnhc.org**)

IIC CONGRESS 2008: Conservation and Access

15-19 September 2008

IIC is proud to present the 22nd biennial IIC Congress, its first in London for over 40 years. It will be held in the Queen Elizabeth II Conference Centre in the heart of Westminster.

A full programme of social events is planned, including a reception in the British Museum and the Conference Dinner on a Thames Riverboat. There will be poster displays and a trade show by suppliers and service providers.

Enabling people to see and enjoy art and heritage is our shared aim. Cultural institutions throughout the world strive to provide and encourage physical and intellectual access to their collections and sites. Conservators and conservation scientists play a vital part in enabling cultural heritage to be enjoyed while not compromising its condition or survival.

The programme will examine the central role of conservation in the presentation and protection of the world's cultural heritage. It will explore the many ways that heritage professionals engage in this sharing worldwide, whether that involves people going to see that heritage or the heritage itself travelling the globe. An impressive range of over 44 speakers is lined up to report on contemporary thinking, current research and examples of best practice. Topics will include conservation involvement in:

- managing the exposure of venerable objects and sites
- collaboration in education projects and enabling handling of collections
- strategic conservation management and prioritising access
- the use of computer technology for access
- safe packing and transport
- public engagement with conservation
- discovering public attitudes towards restoration

The varied locations for conservation involvement cover the range of archaeological sites, monuments, historic houses and churches, museums, libraries and archives. The types of object dealt with range from manuscripts to murals and from fossils to fireboats.
The approaches vary from technical experimentation to philosophical analysis, yet there is a common theme of assessing risks and judging the critical balance between access now and preservation for the benefit of future generations.

Registration fees:	Non-members individuals -	£335
	IIC Individual members and Institutional members -	£295
	IIC student members -	£185
	Student non-members -	£195
	Speakers and poster presenters -	£295

The fee covers: Attendance, morning and afternoon refreshments, and buffet lunch from Monday - Thursday.
The printed Congress Preprints and CD, Prior on-line access to abstracts and papers.
Attendance to evening receptions
Half day visits on Friday.
A free two week pass to National Trust and English Heritage properties.

Separate payment is required in advance for the all-day visits, at the time of registration. Payment may be required for some of the half-day visits, bookable during the congress.
There is an additional fee for the Congress Dinner, which must be booked in advance.
Registration for the Congress is now open. The registration fee is discounted for members of IIC.

BOOK REVIEW

Walter Potter and his museum of curious taxidermy
P.A. Morris 2008

You can buy *Walter Potter and his Museum of Curious Taxidermy* directly from MPM Publishing, West Mains, London Road, Ascot SL5 7DG
Soft-back (ISBN 978-0-9545596-8-7) @ £18.50
Hard-back (ISBN 978-0-9545596-9-4) @ £46.00

Review by Helen Fothergill
Keeper of Natural History (Plymouth City Museum & Art Gallery)

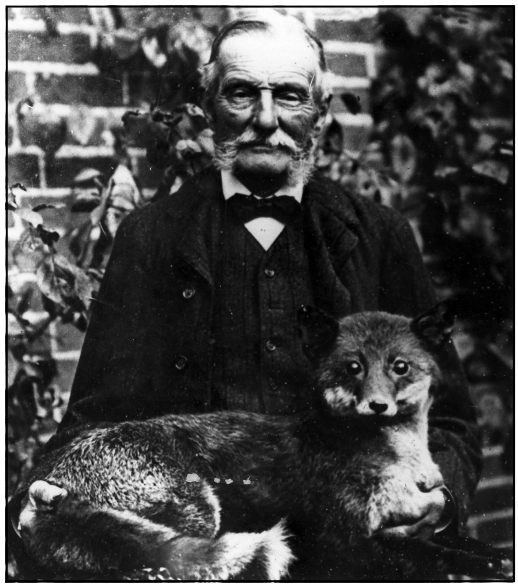
I would be amazed if museum bods working in the natural sciences have not seen or at the very least heard of the astounding Walter Potter. However if this is indeed the case, this publication about his life, works, heights and demise of his museum should be read.

For those of us lucky enough to visit one of the museum's many incarnations, it is a wonderful reminder of what we have lost as an "entity" and perhaps a warning to the museum world as a whole that we are in danger of not seeing the wood for the trees. Many of us operate within strict collecting policies that either limit the scope of what we collect or direct us to only amass "scientific" material. Walter Potter and later custodians were wonderfully free of these restrictions and collected what appealed. We, on the other hand, miss these wonderful eclectic groups that don't sit comfortably within our policies and the responsibility of preserving them usually falls to enterprising individuals (c.f. the Robert Opie collection). The foreword by Errol Fuller stridently sums up my feeling extremely well and the final chapter should give pause for thought to those responsible for acquisition budgets. Morris erroneously supposes no public museums were interested in buying from the final auction, but should be reminded that for natural history curators a purchase price of thousands is difficult to find.

The book documents the techniques used in stuffing and mounting, modelling and arranging the tableaux. This includes x-rays of the stuffed animals with distinctive wiring and hand carved chalk blocks used to cast tiny tin instruments for guinea pigs to play; sourcing carcasses; discussions about the shortcomings of Potter as a taxidermist; illuminating the social commentaries of the tableaux; illustrat-

ions of the displays, publicity and publications and a little repetition. I particularly enjoyed the decapitated kitten's head as a page number marker!

There is some loose speculation and inference in the book, perhaps to make the reader consider what might have been going through MR. Potter's mind, but also due to the lack of much original documentation.



Never the less, it is an excellent commemoration of a remarkable man and museum: charting the transition from fascinating freak show and anthropomorphic animal tableaux to apologies and statements that none of the animals had been killed specially for the displays. It is not only a piece of museum and taxidermy history, but a graphic and beautifully illustrated representation of changing attitudes and perhaps as interesting in (our) modern overreaction to Victorian values as the snap-shot of those Victorian mores themselves. If the only place the history of Potter's collection survives intact is on the bookshelf, then perhaps we should at the very least ensure that this happens.