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**Charles Arthur William “Bill” Pettitt (20 August 1937 – 26 March 2009):
Zoological Curator at Manchester Museum**

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Fig. 1. Charles Arthur William Pettitt, 1937-2009. © Sean Edwards, 1999.

Bill Pettitt joined the Manchester Museum as an assistant keeper in May 1968. Before then he worked for the National Institute of Oceanography (NIO), based in the 'Discovery Huts' from 1962 (Kempe & Buckley, 1987) at the British Museum (Natural History). This work included a number of voyages investigating squid and using sonar. During this time machine processing of data was used and developed which in 1965 involved military resources and, presciently, the University of Manchester Computer Centre. One of the tasks he achieved, which required a formal job interview at the Admiralty, was to move the 80,000 specimen jars of the NIO from South Kensington to Wormley in Surrey. Colleagues and friends who influenced Bill's career at the time in relation to Mollusca included Norman Tebble, Peter Dance and David Heppell. About this time, in his own words, he became a museum curator who was a zoologist rather than a zoologist who happened to work in a museum.

MVH, when becoming Keeper of Zoology at Manchester after 1975, got to know Bill as a colleague. At that time Bill had finished a M.Sc. on winkle polymorphism (Pettitt, 1971), was coordinator of the Littorinid International Research Group and editor of 'Littorinid Tidings' – a newsletter for winkle experts all over the world (Pettitt, 1974-1979). He also served on the council of the Conchological Society and involved with nomenclatural issues (e.g., Heppell & Pettitt, 1992; Pettitt, 1974). Bill's post was re-designated

Keeper of Invertebrate Zoology and during the early 1980s he was also head of the Computer Cataloguing Unit at the museum (Alberti, 2009).

Soon after arriving, MVH got Bill more heavily involved in computer cataloguing, exploiting the university museum's position in having free access to a mega-computer. He first began using computers to catalogue collections in 1965 while still a curator of the 'Discovery' collections. Bill gave up winkle research but did not abandon work on Mollusca altogether (e.g., Cook & Pettitt, 1998), instead throwing himself into all aspects of electronic information retrieval. This led directly to playing a seminal part in the organisation of collections-based research in the northwest that became a national enterprise (see below) and ultimately two books on information management in museums resulted (Orna & Pettitt, 1980; 1998). Bill's developing interest bought him into working with MDA (Museums Documentation Association, Cambridge) and chair of the Museums Computer Group (e.g., Pettitt, 1990a; 1990b). Manchester Museum was already involved in electronic data processing through the work of the Keeper of Botany, Dr John Franks, who had used computer technology to catalogue herbarium specimens from the late 1960s and was involved with IRGMA (Information Retrieval Group of the Museums Association), predecessor to MDA (Alberti, 2009). Bill edited four issues of the short-lived *Journal of Biological Curation* for the Biology Curators Group, 1990-94.

Lunching together in the staff room for twenty years or so meant one saw the lighter side of Bill. His main hobby was railways, both real and model ones. He used to go on railway trips just for the fun of it and had an extensive model railway set-up. He was a leading light in his local model railway club and, of course, adapted an old computer to work out the schedules and to control signals and points. He kept up his interest in molluscs largely by collecting mollusc books of which he had hundreds, many of them rare editions (Heppell & Pettitt, 1996). His library has been sold, part in private hands and with a proportion destined for a public collection.

Collection research units in the natural sciences

This is a personal and anecdotal account (by EGH) of the period during which the North West Collections Research Unit (NWCRU) arose. This subsequently spread to other regions, each with their own collection research unit (CRU), and became the Federation for Natural Science Collections Research (FENSCORE). Unfortunately, delaying this account has meant it was too late for Bill Pettitt to join in. As a result, this lacks his personal contribution and has become an acknowledgment of his role in the development of collections-based research.

The NWCRU did not arise spontaneously. As a young assistant at Liverpool Museum (1970-74) I had become interested in whole, named collections and saw the important link between specimens with this common denominator and the importance of that in historical and scientific contexts. Of course, more established curators appreciated this but a beginner was learning the trade.

One day in 1971 a printed form arrived in the post for filling in collections-based information, devised by Alwyne Wheeler and Ron Cleavelly of the Society for the History of Natural History (SHNH). It was intended to build a national collections index. I started to use the forms, filling in copies for the invertebrate collections in Liverpool and returning them to the British Museum (Natural History) as suggested; it transpired rather few people did this. Later, the form was copied brazenly by the NWCRU, substituting their name for that of SHNH and adding a small number of extra boxes.

At this time there was a widespread movement by curatorial staff in museums to set up specialist groups. To some extent this was based on the feeling, real or apparent, that the Museums Association did not provide a forum for particular subject areas. These specialist groups catered for curatorial interests such as costume and textile history, technology, social history and art. The Biology Curators' Group (BCG) started in 1974, a few months after the Geological Curators' Group (GCG). The latter had an excellent newsletter in which there was a regular column on collectors and their collections by Hugh Torrens of Keele University. He demonstrated the huge amount of historical information that was available and its relevance to locating and interpreting the value of older collections. Hugh had a mission to unearth 'lost' collections backed by an immense knowledge of the history of science. Publicising their existence and sometimes shaming museum authorities for their neglect often had positive results for their rescue.

I moved jobs to Bolton in 1974 and applied this approach to the collections there. In the context of geology, Hugh Torrens was invited to see the palaeontological collection and an account appeared which gave collector details and included a list of the type specimens known at the time (Hancock, Howell & Torrens,

1976). It was disappointing to read a recent account of the geology collections in Bolton describing them as relict and in need of recognition (Craven, 2009). The absence of the earlier reference from that account seems to indicate that in less than a generation of curators this work has been forgotten. The SHNH forms were filled in for Bolton's named collections and for a few other local museums that had no natural history staff or sometimes no curatorial staff at all. These data formed the basis of a paper read at a conference in 1977 on the value of local museum collections (Greenwood, *et al.*, 1977). It was well attended by national museum staff. Both BCG and GCG had developed a relatively strong membership base in London; scientific staff there rarely joined the Museums Association as personal members. At this conference, Bill Pettitt stood up during discussion time and suggested that a regional approach, where there was a density of museums and natural history curators, such as the north west of England, could gather data and was likely to produce more results in a shorter time. This marked the origin of NWCRU, the subsequent development of which has been well-described (Hancock, 1978, Hancock & Pettitt, 1980; Pettitt, 1981) but more detail and personal elements are included here. The involvement of curators on this local scale guaranteed success rather than relying on a more distant questionnaire approach. The SHNH project became the evolutionary starting point for a comprehensive, worldwide fossil collection catalogue (Cleevely, 1983). One shouldn't underestimate the influence of SHNH in this whole process as they provided a forum for those interested in the history of collections and museums. Many natural history curators were paid up members, attended the meetings and even sat on the committee (and some still do some or all of these things). Through that SHNH route they got to know directly of the NWCRU's work and saw that it worked.

Computers were alien machines to most of us at the time but Manchester University was a world leader in computer development and Bill seemed to know all about them. The technology was in its infancy and there were no personal computers. The 'country' boy from out-of-town was shown a huge aseptic room with flashing lights and spinning discs on the fronts of large grey metal cabinets, exactly as seen in a Hollywood film of the time and just as enlightening. These leviathans of the new information technology age spent a lot of time number crunching for Jodrell Bank Observatory, amongst other things. Data plus questions went in at one end and eventually the answer to the meaning of the universe came out at the other. The data input operators worked a few hours during the day to service the process. So, Bill explained, NWCRU will have a lot of data that would take hours to prepare and load into the computer but the processing required a ridiculously small effort on the part of the machine in order to produce a subject index or any other configuration one cared to devise. This balance between human and machine fitted the computer managers' time and motion work schedules perfectly. We were free to use the facilities at any time. I hadn't realised until recently that he wrote a programme called Kraken that told the mainframe to wake up and start processing museum data in the middle of the night. He could pick up printouts on the way to the museum the following morning. Bill talked and understood computer jargon. Later he was able to show off his PET Commodore machines obtained for museum cataloguing at specimen level. This work benefited from the Manpower Services Commission job creation scheme and employed over 40 people and created approximately 250,000 specimen records. From the historical pages on the Commodore website (Matthews, 2003) the PETs was first marketed in USA in 1977 and had a whopping 4 Kilobyte memory! This was state of the art desktop computer technology. I don't recall year or model number of these particular machines in Manchester but it was probably post 1980, when 40 Kb was exceeded. Using these the punched card interface needed to 'talk' to the main frame was unnecessary. Instead, large floppy discs were carried from machine to machine. In every IT development, Bill was instrumental in arguing for upgrades at the museum and usually succeeded.

To fulfil the promise made at Liverpool, we delivered the compilations of the NWCRU research at the next SHNH conference in London. I drove down in a car with two colleagues, Alan Howell and John Gray, the space around them filled with printouts; Bill went by train. The copies were in two parts, by collection name plus a geographical and subject index. They were quite bulky, printed on continuous paper stationery, still folded and retaining the perforations on each margin (Hancock & Pettitt, 1979). Carried in during the first tea break, they disappeared before we could fill our own cups. To fulfil demand all we could say was that another edition would appear soon. This was done early in 1981 and incorporated at least 400 corrections and 80 new entries; many of these were from those who had grabbed copies of the initial version.

Bill was tireless in developing this work and was always the first to suggest a meeting to progress data-gathering and was the genial host in Manchester Museum. Under his guidance other regional CRUs used the facilities at the university and FENSCORE arose. The database is still hosted by Manchester University. It is technically possible to upgrade the FENSCORE database so it can be more easily searched and, particularly, have the capacity to edit and add records by creating user accounts. This is relatively easy to apply and Bill would have been the first to support such a development and, one suspects, done it for us. As a

legacy to his career as a natural science curator, there could be no more fitting tribute.

Bill suffered from continuing heart problems from 1985 that required multiple by-pass surgery. This coincided with the death of his first wife and a lot of pressure at work. He was unable to return full time afterwards, finally retiring in May 1997. However, he helped co-ordinate a conference in 1995, deliver a paper and edit the proceedings on the value of natural science collections (Nudds & Pettitt, 1997) at a time when he was at a nadir in health terms. Finally, Bill succumbed to his condition early in 2009. We extend our sympathies to his wife Elizabeth, two daughters, two step-daughters, and six grandchildren.

A bibliography of papers by C.A.W. Pettitt

This is not complete but gives a flavour of Bill's output and interests. Note that although christened Charles Arthur William the inclusion of all the initials or the order of them varies.

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Acknowledgements

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Sam Alberti helped with several facts many of which are contained in interview tapes with Bill. Oral history could be extended usefully to other museums and their curators. Particular thanks to Mrs Elizabeth Pettitt for some personal background.

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Editorial

“I had no idea conferences could be that good, until I went to the NatSCA conference!”
NatSCA conference attendee, 2010

Charles Darwin stayed for three months in Plymouth before setting sail on his famous *Beagle* voyage. Thomas Henry Huxley landed in Devonport after his voyage on the *Rattlesnake*, and Richard Owen gave an important lecture on the giant reptiles in Plymouth. 2010 was the time when more great natural history curators would descend on Plymouth, for the NatSCA conference and AGM. It was a very interesting conference, with many influential talks about engaging members of the public with museums natural history collections. Thank you to everyone who attended and I hope everyone enjoyed sunny Plymouth!

The above quote from one of the NatSCA attendees sums up the conference. Useful, informative talks followed by interesting tours linking with other organisations in Plymouth. The conference has always been a relaxed way of networking with other curators, and a great way to share ideas about projects they are working on.

This issue has a number of the talks written up, including many great ideas that we can use and share. The issue also has articles about live animals in museums, an impressive Odontological Collection, spirit conservation and a tiger in a library. Thank you to David Notton, at the NHM, for his editorial assistance with several articles in this issue.

Please send me any articles for the next issue by September 30th, for the October Issue. Page 15 summaries the types of articles that have been submitted for *NatSCA News*, ranging from exhibitions, education, collections and conservation projects.

Please contact me if you see a new book you would like to review. Please also let me know of other publications/articles you have written, and I can include the full reference and a brief description in the next issue of *NatSCA News*.

- Jan Freedman

Contributions for Issue 20, October 2010

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 September 30th;

Jan Freedman [Editor, NatSCA]

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View From The Chair

We have just held a very successful and well received annual conference hosted by Plymouth Museum and Art Gallery on the subject of 'Public Engagement in Natural Science', attended by 35 delegates, which considering the remoteness of Plymouth and the present economic climate, was not too bad an attendance. Many of the papers in this issue of NatSCA News are from the conference. We held our AGM on the day when the Nation voted for, what was to become the hybrid Conservative – Liberal Democrat Government and we hope that our new regime will not lose sight of their responsibilities to suitably fund our Natural Science Museum Heritage. News as of 9th June is that MLAC has asked for 3% cuts from all Renaissance in the Regions hubs and the Director of the Museums Association, Mark Taylor says that these cuts are the "calm before the storm". Even here at the Natural History Museum, we are planning a 5% cut in the operating budget (circa 40 posts of which c.10 are presently vacant), strategically directed at science research groups, public engagement and corporate departments so far and which are presently being negotiated with the trade unions. Museum Management hopes to re-employ staff if possible. Even I, as a curatorial staff member, feel that my job is not safe, being a curator of small 'strategically less important' insect groups. The Natural History Keeper post at Chelmsford Museum has been cut and the Natural History Collections are now the responsibility of the Keeper of Science and Industry and they will not be able to continue the natural history identification and other services, although they report that "biodiversity issues in the borough are already covered by existing staff in Parks & Heritage Services". They do report that they "aim to redisplay natural sciences in Chelmsford Museum and will need the involvement of a natural sciences specialist".

We welcome to NatSCA committee, Claire Mellish who is a Palaeontology Curator and David Notton, an Entomology Curator, both working at the Natural History Museum, London. We also welcome back and thank again for re-standing, our capable Treasurer Tony Irwin, our experienced Membership Secretary Maggie Reilly, our able Editor Jan Freedman, our Conservation expert Simon Moore, our ever knowledgeable and indispensable Kate Andrew and our North-Eastern rep. Nicola Newton who is offering to hold next year's NatSCA AGM and conference at The Hancock Museum in Newcastle and so I hope that as many of our more Northern and Scots members will be able to attend.

At the Plymouth meeting, we invited the new SSN coordinator Rebecca Elson who was very keen to find out more about NatSCA and will help us to further develop our Subject Specialist Network status. We also started very amicable discussions with committee members of the Geological Curators' Group, to move towards a sharing of our SSN status for the common good of both our organisations. There is some SSN funding available to us which we hope to access and we are working with GCG on the application, so watch this space for future developments. This we have communicated with Rebecca Elson and to start, we are sharing the new and still developing, Natural Science Collections SSN webpage at 'Collections Link' <http://www.collectionslink.org.uk/> which will hopefully soon have portal links to both our own websites. We look forward to a much closer relationship and collaboration with GCG!

We have also been invited to co-sponsor a major two day, international conference next year to be held at the British Museum, Pest Odyssey II, which will cover the advances made in Pest Management since the first conference held at the British Library in 2001. We will be advertising this as soon as details are finalised.

Paul A Brown, 16.vi.2010

NatSCA AGM
1.30 – 2.15pm, Thursday 6th May, 2010
Plymouth City Museum and Art Gallery, Drakes Circus, Plymouth, PL4 8AJ

Minutes

Committee members present: Paul Brown (chair), Tony Irwin, Miranda Lowe, Nicola Newton, Clare Brown, Jan Freedman, Paolo Viscardi, Hannah Paddon, Maggie Reilly, Kate Andrew

Apologies for absence

Simon Moore, Leslie Noe, Pip Strang, David Notton, Claire Mellish

Minutes of AGM Leeds City Museum, 7th May 2009

The minutes of our previous AGM held at Leeds City Museum, May 7th 2009, were published in NatSCA News issue 17 in August 2009. The Treasurers Report was incorrect! The updated minutes were signed by the chair as a correct record of the proceedings.

Chairman's Report: Paul Brown

We have had another busy year during which the economic climate continues to deteriorate, with the end of Natural Science Conservation at Hampshire Museum Services and the end of natural science cover at Chelmsford Museum, even though they have recently spent much on new museum building, and many other smaller cuts throughout the local museums.

We continue to talk with our 'The Subject Specialist Network' status to organisations in the UK including the Geology Curators Group and the Care of Collections Group of the Institute of Conservation. I attended a meeting of the latter at Hampton Court where we discussed common objectives. Miranda Lowe represented us at an National Biodiversity Network/ National Federation of Biological Recorders meeting on 26th January 2010 and they hope to increase data access, validation and relationships with museum collections. We also talk with the International Council for Museum's Working Group on Natural History collections and the Society for the protection of Natural History Collections (North America). Some of our membership attended the Naturalis, Leiden SPNHC conference 'Bridging Continents: New initiatives and perspectives in Natural History Collections', where discussions occurred on the setting up of local SPNHC nodes across the world and that there should be a European node. As chair of NatSCA, I represented the views of our membership informally to SPNHC officers. If there is to be a European Node or a UK and Ireland node, NatSCA must at the very least be affiliated and kept in very close communication with, if not being an integral part of such a group, so as to avoid effort spent 're-inventing the wheel'. I hope that we can formally explore this area more closely so that both our memberships can benefit. As I noted in my Leiden 'view from the chair' out of the 49 United Kingdom and Ireland attendees at Leiden, there was a strong representation of 40 from the Natural History Museum in London, three from the national museum in Cardiff and one each from the national museum in Edinburgh and the national museum in Dublin. This reflects the economic strength of the NHM in that they can pay for SPNHC memberships and conference attendance and less so for other national museums. Only two attendees from the Horniman Museum London, and Simon Moore were from the general NatSCA members who come from local museums who's budgets and staff private incomes do not stretch to cover expensive memberships and conferences! The Natural Science Conservation Group broke away from the Institute of Conservation (ICUK) when they greatly increased their subscriptions. We will continue our low subscriptions and cheap yet good value conferences and publications so that as many members can afford to attend.

With the predicted shrinkage in public funding for the museums sector and for our sector in particular (e.g. the planned restructuring at Bristol Museum which both NatSCA and GCG lobbied to show our concerns and just look how successful the recent exhibition of the donated 'Banksy' graffiti art installation has been there to pull in their public), we will attempt to provide a protection or at least a united common voice for our jobs and our collections. I do not promise any quick fixes but we all must work hard together to ensure a proper, constructive and coordinated argument for the future of our sector for the common good. We continue to seek information on collection at risk and write letters of concern to the relevant governing bodies.

Ed Baker and Mike Sadka at the NHM have been employed to work on and improve our Website. We have

left our NHM hosted site and have a new domain at <http://natsca.info/> and our new jiscmail discussion site at <https://www.jiscmail.ac.uk/cgi-bin/webadmin?A0=NATSCA>. Ed noticed problems and omissions such as lack of search capability, no publication contents, and linkage issues and has used the new 'scratchpad' technology to revamp our site. We have scanned most of our NatSCA News issues and The Biology Curator and NSCG News for which we hold copyright and are available at <http://natsca.info/category/publications/natsca-publications>. I continue to work closely with Ed on increasing the web availability of our publications. We have added links to associated websites and a page for the Insect Collection Managers' Group and I wonder whether there are any other groups who do not have a website and who would benefit from having a similar web-page to raise their profile? We also have a NatSCA Facebook up and running which can be accessed from the NatSCA website. If you have any news items, museum jobs or relevant seminars to advertise then please send to Maggie for emailing, Jisc-mailing and for the website.

We have also been exploring the possibility of training for natural history curators and have put in a 'Skills for the Future' bid to the Heritage Lottery Fund. The chair handed over to Kate Andrew to discuss further:

NatSCA, with partners in the West Midlands, Yorkshire, the North West and at the NHM, have applied for money from the HLF's 'Skills for the Future' fund. The project involves employing eight curatorial trainees for one year, five of which will be natural scientists. The trainees will be based in regional museums but will spend time visiting other museums and working for a time at the NHM. We will find out if the application has been successful at the end of May with the first round of trainees starting work in October.

Paul Brown: We welcome to the conference the new Subject Specialist Network coordinator Rebecca Elson who will speak to us tomorrow. We held a successful annual conference in Leeds City Museum on 'Collections use: Past, Present and Future', the papers for which are published in NatSCA News issue 17. We held a seminar on 'Natural Science Collections and the Law' (for the UK) at The New Walk Museum, Leicester, which was exceedingly informative and we are speaking with Government bodies who are finally listening to what we require from the law to collect and hold in our collections, CITES listed, taxidermy, prescribed and dangerous specimens. Our next seminar on the 'Identification of Osseous and Keratinous material' will be held at Leeds Museum Discovery Centre on 2nd November 2010.

I have to report the sad loss of Peter Stafford who died in early October 2009. Peter was voted onto NatSCA committee at our Sheffield AGM in April 2007 and, due to his illness, he was not able to fully serve NatSCA and so retired at the 2009 AGM. His Botanical, herpetological and microscope slide knowledge and experience will be greatly missed! We also see the exit from committee of Hannah Paddon, Gerry McGowan and Jeanne Robinson who are retiring from the committee this year and we extend our thanks to them and wish them all the best for the future. Many of those standing again are those who have served often many times before. At our next AGM, why not think of standing for committee as we are always looking for new blood with knowledge and enthusiasm!

We welcome C&D Sheet Metal (Engineering) Ltd of Belvedere, Kent who recently fitted out the Natural History Museum, London's Darwin Centre 2 with new Entomology and Botany cabinets and Ocean Design and Management Ltd. with racking and shelving systems. Please visit their trade stands over lunch today! The chair also reported that Harry Spurr (Stephenson Blake) drawer manufacturers had recently gone into liquidation but that they might go back into production, so watch this space!

Secretary's Report: Clare Brown

	Thinktank 29/6/2009	NHM 12/10/2009	Norwich 18/1/2010	Horniman 22/3/2010
Clare Brown	✓	✓	✓	✓
Gerry McGowan	✓	✓	X	X
Hannah Paddon	X	X	X	X
Jack Ashby	X	✓	X	✓
Jan Freedman	X	✓	X	✓
Jeanne Robinson	X	X	X	✓
Kate Andrew	✓	✓	✓	✓
Leslie Noe	✓	✓	X	X
Maggie Reilly	X	✓	X	✓
Miranda Lowe	✓	✓	X	✓
Nicola Newton	X	X	X	X
Paul Brown	✓	✓	✓	✓
Paolo Viscardi	✓	✓	✓	✓
Pippa Strang	✓	X	X	X
Simon Moore	✓	✓	✓	✓
Tony Irwin	✓	X	✓	✓

Treasurer's Report: Tony Irwin

The accounts for 2009/2010 have been examined by Velson Horie, our Honorary Auditor, who has approved and signed them.

The major points to note are that the number of paid-up members has reduced leading to a drop in subscriptions income of £442 on last year. As predicted, the interest from our deposit account has fallen to virtually nothing, so we are £387 down on last year's figure, but this is offset by a welcome increase of £227 from advertising. Our meeting income fell by £502, mainly because we had fewer meetings with fewer attendees. On the expenditure front, our meetings expenditure fell by £509, offsetting the fall in income. Committee travel expenses reduced again by £290, and postage was reduced by £36, though increased contact with the membership has been possible through more use of e-mail.

Website costs went up, as we intended, resulting in improvements to and more regular updating of the website. The production of three rather than two newsletters increased our printing costs by £1652.

Overall this has led to a loss over the year of £3652, compared with £1374 last year.

As we had intended to reduce our reserve in line with Charity Commission guidelines, we have achieved what we set out to do, but the manner in which we achieved this (by reducing income, rather than increasing expenditure) is not what we had intended, and we will be monitoring the situation carefully in the coming year.

Finally thanks to Velson Horie for inspecting the accounts, and to my fellow committee members for their support throughout the year. If anyone would like a copy of the full accounts sheet, please let me know.

NATSCA ACCOUNTS 2009-2010
(1 Feb 2009 - 31 January 2010)

	2009-10	2008-09			
10 INCOME					
Subscriptions (*note 1)					
159 Personal @ £15.00	2385.00			2655.00	
1 Incorrect rate	15.35			18.22	
5 Student @ £10	50.00			30.00	
1 pers.sub for 2008 @ £15	15.00			30.00	
50 Institutional @ £30	1500.00			1620.00	
1 pers.sub for 2010 @ £15	15.00			30.00	
3 inst.sub for 2010 @ £30	90.00			150.00	
Total of 244 subscriptions		4070.35			4533.22
Other income					
Interest (deposit account) (* note 2)	13.10			400.10	
Incorrect payment (to be refunded)	50.00			16.23	
Donation				5.00	
Sale of back issues & advertising	227.50				
Total other income		290.60			421.33
Meeting income (*note 3)					
2009 AGM (meeting fees & conf meals)	3718.80			3190.00	(2008agm)
2010 Taxidermy and the Law Seminar	240.00			250.00	(con.srvy)
				50.00	(anoxia)
				1970.00	(adhes.)
Total meeting income		3958.80			5460.00
TOTAL INCOME			8319.75		10414.55
11 EXPENDITURE					
Subscriptions, etc.					
Information Commission (data protection)	35.00			35.00	
National Biodiversity Network	27.00				
Total Subscriptions Expenditure		62.00			35.00

Meetings			124.30	(2007agm)
(Speaker's expenses)				
(Catering)			309.59	(anoxia)
(Speaker's expenses)			170.44	(anoxia)
(Catering and room hire)			385.06	(con.srvy)
(Speaker's expenses)			260.48	(con.srvy)
(Bursaries)			78.20	(con.srvy)
2009 Conference (*note 4)				
Speakers expenses	620.94		896.18	(2008agm)
Room hire and catering	4349.20		2534.65	(2008agm)
Bursaries	200.00		670.66	(2008agm)
	229.43			
Miscellaneous (Welcome packs)				
(Speakers expenses)			62.70	(adhes.)
(Room hire and catering)			616.29	(adhes.)
Leiden Meeting - bursary	100.00			
		5499.57		6108.55
Total meeting expenditure				
Committee expenses (* notes				
Insurance	910.04		910.04	
Travel to meetings	1019.80		1310.52	
Postage	31.46		67.04	
Printing & distribution of newsletter	3722.91		2069.48	
Misc. (Website)	726.58		100.68	
		6410.79		4481.34
Total operational costs				
TOTAL EXPENDITURE			11972.36	11788.86
Difference between Income and Expenditure (2009/10 loss)	-3652.61			-1374.31
ASSETS				
HSBC Deposit account 41653636				
Opening balance, 1st Feb 2009	23439.71		23039.61	
Bank interest	13.10	13	400.10	
transfer to c/a	-1000.00		0	
Total and actual balance, 31 Jan 2010	22452.81		23439.71	

HSBC Current account 91645722		
Balance on 31 Jan 2009	4484.89	6259.30
Balance on 1 Feb 2010	1819.18	4484.89
Total Assets (Cash Funds) at year end	24271.99	27924.60
Assets at start of year	27924.60	
2008/09 loss	3652.61	
	24271.99	

* Points to note:

1. The fall in subscriptions has reduced our income by £442.
2. Deposit account interest has fallen to virtually nothing. Unfortunately we are unable to take advantage of better interest rates offered to private customers in alternative accounts.
3. We are still owed some fees for meetings from 2008 and 2009. The lack of additional meetings this year has impacted on income, as well as affecting the numbers of additional members who join to take advantage of reduced seminar fees.
4. While expenditure on meetings fell (because there were no additional seminars), the cost of the Conference in 2009 rose by over £1300. This was largely due to increased catering costs (though all the attendees agreed the food was excellent).
5. Committee members have managed to reduce travelling costs this year. Although we have not yet begun videoconferencing, we are discussing much of our business by e-mail.
6. The increase in Newsletter production costs is because three, rather than two, issues were produced in 2009.
7. The website has been completely overhauled this year, and this is reflected in the increased costs. More expenditure is planned for this year to improve content still further, and keep it up-to-date.

Overall these differences have led to a loss of £3652 this year, as opposed to last year's loss of £1374. It was the Committee's intention to reduce our financial assets in 2009, though we had hoped to achieve this through targeted expenditure rather than reducing income. The targets for 2010 will be to achieve self-funding conference and seminars, so that more can be spent from our reserves to further the Association's aims.

The accounts are based on the bank transactions that took place in 2009-10. Issued cheques that were presented or banked after 31 January are not accounted.

Tony Irwin 31 March 2010

Signed by Velson Horie (Hon. Auditor) as correct 7 April 2010

The chair moved that the AGM accept the Treasurers report which was proposed by Kate Andrew and seconded by Paolo Viscardi.

Membership secretary's Report: Maggie Reilly
1 February 2009 – 31st January 2010

The total membership for the year was 226, broken down into 170 personal members and 56 institutional members. The membership secretary's figures tally with Treasurer's figures but different figures appear on

track them on the bank statements. We also ask members, other than those who pay by standing order, to return a membership form each year as that is a double check on membership records.

A new membership leaflet has been produced and will be distributed as appropriate. Word of mouth is a most useful way to attract new members so the committee would ask the membership to encourage others to join and benefit from NatSCA activities.

Due to lack of storage space, hard copy back issues of the journal have been reduced to a minimum. Back issues are available as downloads from the website a year after publication so issues 15 and 16 will be live shortly, 17 and 18 will be later in the year.

To clarify how we currently communicate with members – there are three main ways : via the website, via JISCmail and via email distribution list. The website is updated as required. Around half (?) the membership is signed up to JISCmail and information, queries and job ads are regularly posted there. For information where require to reach the maximum numbers of members (seminar/conference info and bookings, job ads etc.) the email distribution list is used which is the most comprehensive membership contact list we have. Providing an up-to-date email address has been supplied on the membership form, members will be on this list. Members who are not on email will receive important information by post.

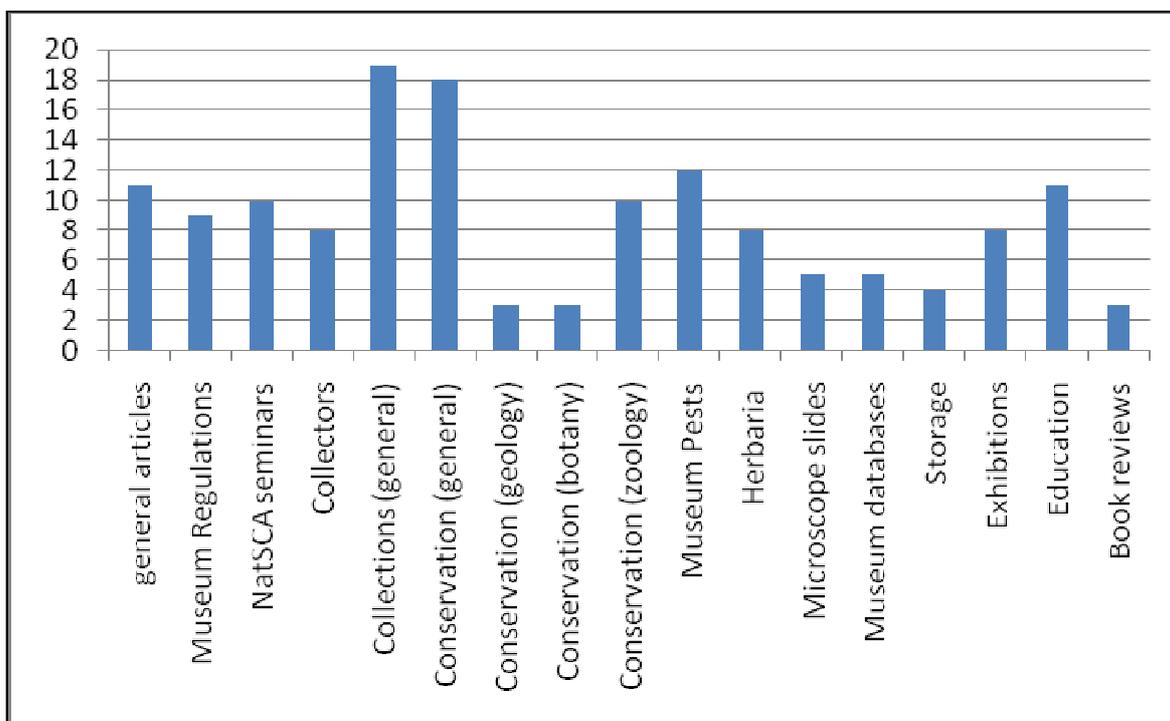
Editorial & Website Report: Jan Freedman

The next Issue of NatSCA News will be out in July. Due to a shortage of articles, it was decided to hold back the March 2010 issue. The Editor is looking into options for printing *NatSCA News* in colour.

How to submit an article;

- Email the Editor if you are interested (jan.freedman@plymouth.gov.uk)
- Send your article in Word format, with images attached separately
- The Editor will format the article and send the author a PDF proof to check.
- Send the Editor any amendments to the proof by the given deadline.

There a variety of articles which can be submitted to *NatSCA News*. Below is a table illustrating the varying topics of articles from *NatSCA News* Issue 1 – Issue 18;



Submitting an article for *NatSCA News* allows projects in other museums to be seen and read by other natural history curators as well as promoting your museum collections. Please contact the Editor if you have an idea for an article for *NatSCA News*.

Google analytics has been used for the NatSCA website (www.natsca.info). Between April 2010 and May 2010 the website has received 384 visits, with an average time on the website of 3 minutes, 12 seconds. The main way of getting onto the website is through Google, searching for 'natsca' and 'natsca news', and visitors have also come through to the website via links on other websites (i.e. the geological curators website [www.geocurator.org]). The visitors are mainly from the UK, with a number of visitors from the United States, Canada, Australia, Netherlands, Spain, France and Germany.

Natural Science Conservation (& Institute of Conservation) Report: Simon Moore

With my change in job status and becoming a 100% freelance Natural Sciences Conservator in November 2009, I am now able to devote more time to the planning of more practically-oriented seminars once again.

Although this year has seen none of this genre of seminar, those seminars on DEFRA regulations relating to certification of natural history collections and another about the legal side of taxidermy specimens, were well attended and enjoyed.

Conservation in natural sciences still continues to move onwards and as the discipline is becoming more recognised in other countries, the all-too valuable knowledge sharing and expertise are spreading wider each year.

I have also been much encouraged to see others writing in *NatSCA News* about conservation matters and technology and hope that this will increase, also an article in *Conservation News* (ICON's journal) about the further usage of Japanese tissue in taxidermy restoration.

Each year more students are being encouraged to qualify in Natural Sciences and I hope that this will increase so that none of our old technology will be lost and that instead, it will be ameliorated.

Election of Ordinary members to NatSCA committee :

Nominations for the committee, proposed and seconded by NatSCA members, received by Clare Brown are as follows:-

Editor 2010-2012 Proposed: Leslie Noé	Jan Freedman Seconded: Clare Brown	Plymouth Museums
Membership Sec.2010-12 Seconded: Geoff Hancock	Maggie Reilly	Hunterian Museum Proposed: Richard Sutcliffe
Conservation 2010-2012 Proposed: Kate Pocklington	Simon Moore Seconded: Nigel Larkin	Freelance
Treasurer 2010-2013 Proposed: Clare Brown	Tony Irwin Seconded: David Waterhouse	Norwich Museums
OM 2010-2012 Proposed: Maggie Reilly	Nicola Newton Seconded: Pip Strang	Hancock Museum
OM 2010-2012 Proposed: Jan Freedman	David Notton Seconded: Paul Brown	NHM, London
OM 2010-2012 Proposed: Paul Brown	Claire Mellish Seconded: Clare Brown	NHM, London
OM 2010-2012 Proposed: Maggie Reilly	Kate Andrew Seconded: Paul Brown	Hereford Museums

As there are vacant posts and candidates to fill them, no election is required. If there are no objections to any of the candidates, can we accept and elect the listed people en block onto committee to serve for three years for the treasurer and two years for other committee members?

Proposed: Rosina Down
& Seconded: Paolo Viscardi

12. Any Other Business

No other business.

Vote of thanks: Paul Brown

I wish to thank the work done by committee over the last year and Hannah Paddon, Gerry McGowan and Jeanne Robinson who are stepping down from committee and I welcome David Notton and Claire Mellish who are new to committee. Also I thank all our conference speakers, the staff of Plymouth City Museum & Art Gallery and those who organised the conference, in particular, Nicola Moyle, Jan Freedman and Helen Fothergill who led the conference tours.

I ask the AGM to show their appreciation year in the usual way.

Close

Review of the NatSCA Conference at Plymouth City Museum and Art Gallery **6th & 7th May 2010**

Hayleigh Jutson

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This article is a summary of the ten talks and selected tours which took place over the duration of the NatSCA 2010 conference and AGM, here at Plymouth City Museum and Art Gallery (PCMAG).

I am the Cultural and Heritage venue operations apprentice, working alongside Jan Freedman on the Natural History department over a period of 12 – 14 months. In this time I will also be spending a week in other departments around PCMAG, as well as a 3 month placement at Cotehele National Trust, and 5 weeks at Plymouth and West Devon Records office. These types of apprenticeships are a brand new scheme developed by the Education Development International plc (EDI), which enables the learner to achieve a national award based on typical job responsibilities within an industry in collaboration with Creative and Cultural Skills.

At the time of the NatSCA conference, I had been with PCMAG for 2 months, and was rather curious as to how other museums run in comparison to ours and also as to what the conference would encompass. I was extremely excited to meet the various natural history curators from museums across the UK. It was particularly interesting for me to assist in the organisation and development prior to and during the conference, to see how conferences are set up and the work involved.

Thursday 6th May

The day began with registration and refreshments at PCMAG's Café shortly followed by the beginning of the conference with a brief introduction from Jan Freedman and Paul Brown, and a warm welcome to Plymouth City Museum and Art Gallery, from the City Curator, Nicola Moyle.

The Green Rooftop

The first talk of the day was given by Jo Hatton and Emily Dutton from The Horniman Museum and Gardens. The profile of natural sciences, both within the organisation and externally, has been successfully raised by opening a new nature based hands on gallery with over 300 handling specimens supported by *Renaissance in the Regions*, and an accompanying website supported by City Bridge trust. Along with this they also introduced a range of new learning programmes, which link and improve access between their indoor and outdoor collections of the museum and gardens. These are run with school and community programmes and involve the outdoor building, planting in the wildlife garden, and outdoor walks with games. All of these new schemes has not only encouraged families to improve their knowledge and understanding of Natural Science, and highlighted a renewed interest in their collections (particularly from their trustees), but has also enabled the Horniman Museum and Gardens to achieve their best ever visitor numbers. One activity that stuck out for me was where a visitor picks a character and discovers what it is like to be a nature explorer based on their character.

A Natural Renaissance

The second talk of the day was from David Craven from Renaissance North West, addressing the issue of no matter how beautiful and important natural science collections are they are still not being valued as they should be. After viewing such documentary programmes as: 'Planet Earth', 'Wonders of the Solar System', and 'Museum of Life', the general public interest in nature has rapidly increased and museums are capitalised to encourage this interest and provide the information they desire. After observing the statistics of these 3 programmes alone, the combined total was an astonishing 17.5 Million keen viewers!

In order to prevent natural science collections within museums from being neglected and, worse, abandoned in basements, Renaissance North West are building on existing networks of natural science curators to help support museums that have no specialist staff. They are attempting to develop this by creating partnerships

between museums and external bodies and providing them with a tool kit for good practice. This will make better use of their collections and illustrate how to make them more relevant to the public. For example, acting as advocates and producing new display cases to link collections to wider agendas about climate change, habitat preservation and biodiversity; making the museums work together on current issues which affect the general public today.

The 'Who Cares' project shows how natural science collections have positive effects to peoples health. Research concludes that as little as 5 minutes nature exercise outside improves emotional and mental well being which museums can use to their advantage. The main point of this talk which really stood out to me was the fact stated that natural science collections are not just about science, they are about human endeavour! They provide us with the information as to who we are, how we came to be, where we are going and the impact we have along the way.

A Wild Group

After a quick refreshment break, the conference then continued with the next talk from PCMAG's Collections Manager Helen Fothergill, and Acting Keeper of Natural History, Jan Freedman. This talk outline Wild About Plymouth, a group of family friendly, natural history events in Plymouth funded by *Renaissance in the regions*. The group was set up in 2005 in partnership with the University of Plymouth, with the main aim of promoting the local natural history in the city. This has been, and continues to be, delivered by real scientists engaging the public with science, using sites around the city, and PCMAG's natural history collections. Over the years the Wild About Plymouth events have been well received gaining numerous new partners, which has significantly helped the success of the group. Interestingly staff attending the events have noticed that several families and adults are regular attendees.

Most of the events are free to attend however there are a few advanced booking events, which have a small fee attached, which assists in covering the costs, and also guarantees attendance. At each event, an evaluation questionnaire is given out, which is used for the annual evaluation of Wild about Plymouth. The group caters for all audiences, from families to the older 'specialist interest' group. The programme of fun and interactive hands on events continues to be successful and popular with the people of Plymouth.

An understated helping hand

The fourth and final talk of the day was from Carolyn Holmes, who discussed "Volunteering flagship at Leicestershire County Council Museums". This talk outlined how the collections resources centre provides a unique resource where volunteers work with natural history collections outside of museum sites. This work has been highlighted by the Renaissance East Midlands, by receiving a volunteering flagship for their work by the *Natural life team*, and best practice approaches to policies, support and recruitment.

As an outcome of the volunteering flagship, over a 45 week year there were almost 19000 volunteering hours provided; since April 2009 more than 27 new volunteers have been registered working from home, at events, or directly on the collections. This has highlighted opportunities beyond subject specialist interest, and new approaches such as home-based volunteers which previously may have been excluded due to rural location, personal circumstances.

Volunteers have brought their skills and added value to the museum, by giving up their free time. This has helped Leicestershire County Council Museums provide greater access and opportunities for local groups and the public, so it is important that they know how appreciated their help and skills are! Buy them a cake on their birthday, treat them to lunch or even if it's just a card to say thanks. There are significant opportunities for growth and development of volunteering opportunities on offer. To find out more information contact Carolyn Holmes on 0116 3054102.

In the afternoon, the AGM meeting commenced at 13:30 – 14:15 after which the selected tours began at: The Marine Biological Association, the National Marine Aquarium, Lab Plus at the University Of Plymouth, and the Natural History Collections at PCMAG.

Behind the scenes at the National Marine Aquarium

I escorted attendees on the tour of the National Marine Aquarium, where we were kindly greeted by Caroline Johnson, the Aquarium's Senior Learning Officer. Caroline led the tour of the Aquarium galleries, and behind the scenes where food preparation and feeding takes place and explained how this is done, with some tanks using divers to feed the sharks! Caroline then handed us over to a colleague to show us the pa-

thology lab with a brief talk of how it is used to screen for diseases, and every animal that dies at the Aquarium has an autopsy carried out. It was a very interesting tour and it was nice to see the level of passion and affection the National Marine Aquarium staff have for the marine life they house from naming them, right down to supporting specific dietary/exercise needs of particular animals. I must admit I found myself favouring 'Snorkel' their blind epileptic Loggerhead Turtle, as I am certain many others did also.

The evening was spent with wine and a meal on the Barbican, one of the oldest parts of Plymouth. This provided a great opportunity to carry out networking and discuss ideas about future projects.

Friday 7th May

After registration and refreshments the day began with a talk given by Kate Andrew from the Hereford Museum Resource and Learning Centre. This talk outlined how the audience development plan, which had been drawn up for the centre as part of the funding application to the *Heritage Lottery fund*, had achieved, and in some cases, exceeded the targets set.

Programmes ranging from open days, specialist meetings and behind the scenes activities, to target audiences were open to several different audiences, from general and specialist groups, local ethnic minorities and lower socio-economic groups, to long-term volunteers and friends. This wide ranging programme of events in the Resource and Learning Centre has opened up 100,000 strong natural science collections. Kate highlighted that due to their success these activity programmes were becoming over run; the service is now aiming to open these activities less frequently with more purpose.

Subject Specialists

The second talk of the day was given by Rebecca Elson from the Renaissance, Museums, Libraries and Archives Council. Rebecca described how the development of ongoing Subject Specialist Networks (SSNs) will contribute to a process in which all museums foster a relationship based on professional respect.

Since October 2009, the MLA, have been investing time and resources into reviewing, stabilising and supporting SSNs with a focus on 20 key subject areas; natural sciences are one of those 20. For more effective use, the development of a framework for an SSN charter, to link national and regional engagement is underway.

Specimens for Further Education

Next, Angela Smith from Gloucester Museum Service highlighted how they are aiming to increase access to their collections through partnerships with universities and high schools. One main aim of this increased partnership is to increase research and scholarship on the collections, which in turn will increase further researchers and specialists to the museums collections.

The background of this project began with the interest to promote taxonomy to the local University, which has evolved into the project they are currently underway with; to increase access to their collections. The result of this project has produced vast improvements, with changes to the storage of the natural history collections at Gloucester museum, and increase the access and use of previously neglected stores.

A fascinating discovery which came as a result of this project was finding an annotated book within the museums collection, that had once belonged to entomologist Albert Brydges Farn. This book related to the recently discovered letter which Farn had wrote to Darwin, containing the description of a population of moths turning darker as soot made trees darker, which has turned into an investigation on how much Charles Darwin knew about the evidence supporting melanism.

Darwin events

The fourth talk of the day was given by Paolo Viscardi from the Horniman Museum. Paolo outlined improving communication with the public about biological sciences, using the bicentenary of Charles Darwin's birth as a focus. The Horniman Museum worked in collaboration with partnerships such as the Grant museum, the society of Biology, and the Wellcome trust who provided funding of £30,000 to enable events, activities and exhibitions. These all related to Darwin's contribution to science and consisted of: Café scientifique – key stage 4 resources and dialogue events, Music concerts, Photography competitions, Garden explorer backpacks, and many more.

The impact of this projected resulted in publications from the Southwest Journal, BBC news and the Guard-

ian webpage. There was a 20 percent increase in visitors to the museum at an averaging of 10,000 people on top of their usual visitor figures, and around 500 attendees to the events, activities and exhibitions. And most importantly the collections did not suffer as a result of the project.

Google and Penguins

The next talk was from Mark Carnall, Curator at the Grant Museum, outlining how natural history museums are not efficiently promoted on the web. Mark made an interesting point that not enough people actually know what a curator is or what they do. We should be celebrating the professions of natural history, making people more aware of how interesting the job is and promoting just how interesting our store rooms and collections are.

The solution to this problem is simply as Mark stated, "If you can't beat them..... Do it yourself"; employ wikipedians, make sure points of interest are out there and more widely noticeable and informative. Work together, link each other and celebrate what you do with emotion!

The old ideas are always the best ideas!

The fifth talk of the day was given by Tony Irwin from the Norfolk Museum and Archaeology service. They have recently revamped their natural history galleries. Tony highlighted how sticking to the old fashioned way to attempt to engage the public by incorporating large numbers of objects with short labels has helped them to achieve displays that are exciting, engrossing and entertaining.

Behind the scenes tour at the Marine Biological Association

In the afternoon the selected tours commenced, to which I escorted attendees on the very interesting tour at the Marine Biological Association (MBA). The MBA was founded in 1884, and is the longest continuous surveying organisation in the world. Here we were greeted by John Rundle, who gave us a quick introductory presentation on the MBA and his involvement. This was followed by a tour of the MBA holding tanks with explanations of their sea water sources and system which supplies their tanks with water. John also showed us various marine animals held at the MBA, with a brief informative talk about why they had the specimens and the research currently being carried out at the MBA. After our tour with John, Linda Noble who is the Head of Library and Information services gave us a tour of the National Marine Biological Library. The library contains a valuable resource including survey notes and diaries, as well as rare 1st edition books by Charles Darwin and Thomas Henry Huxley.

Final thoughts

The whole conference was extremely interesting, and I came away with many new contacts, and a whole list of ideas for future projects! I was quite overwhelmed by how many people attended the NatSCA conference, from all parts of the UK.

As a new employee of the museum world this conference has opened my eyes as to how much museums help each other and share ideas as well as feedback on what has/hasn't worked for others in the past etc. For some unknown reason I was under the impression that museums were in fact competitive with each other and this conference has corrected me in my assumptions. Now that I have been introduced to NatSCA, and witnessed a conference I would like to say that I think it is an excellent cross facilitation source to enable curators to share ideas in order to help each other improve promotion of their collections and the quality of their displays.

Acknowledgments:

Thank you to everyone here at Plymouth City Museum and Art Gallery for the opportunities they have and still are giving to me, especially, Mark Tosdevin, Helen Fothergill and my mentor Jan Freedman. And to those of you who have kindly invited me to visit their museums. It was a pleasure to meet all of you, and I hope you all enjoyed the conference as much as I did.

Shout it from the green roof top: raising the profile of Natural Sciences at the Horniman Museum and Gardens

Jo Hatton¹ & Emily Dutton²

¹Keeper of Natural History

²Gardens Learning and Access Officer

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Background

The Horniman Museum was founded by Frederick John Horniman (1835-1906), the second son of John Horniman, tea merchant and founder of 'Horniman's tea'. Frederick collected natural history specimens as a boy and this developed into a more serious passion for collecting later in life. By the end of the 19th century, Horniman had formed a museum which contained many thousands of specimens and cultural artefacts from around the world. In the early 1900's, the museum, collections and surrounding land were donated to London County Council, as a free gift to the people of London forever for their '*recreation, instruction and enjoyment*'. The Horniman today is a charitable company limited by guarantee and a Non Departmental Public Body which receives its core funding from the Department of Culture Media and Sport (DCMS).

Collections

The museum contains around 350,000 items covering Natural History, Anthropology and Musical Instruments. Natural History is the largest collection, with around 250,000 specimens. The Anthropology and Musical Instrument collections are designated. The museum also maintains living collections - 16 acres of gardens as well as a very popular aquarium. The Library is currently housed in a building developed on sustainable principles and is covered by a 'green roof'.

Hands-on the world

The Horniman has a strong 'hands-on' approach to learning. There is a separate handling collection containing around 3000 items housed in our 'Hands on Base'. These provide a close up and personal encounter with artefacts and specimens that reflect those held in the permanent collections.

Community and audience

Thanks to several re-developments over the past decade, the number of visitors to the museum has grown rapidly. During 2009-10, the museum received over 600,000 visitors, 750,000 if the Gardens are also included. Our visitors are mostly local, coming mainly from London and South East England. The audience is diverse; 70% are family groups and over 30% are from the BME community. We have a high number of repeat visitors. The aquarium, Natural History Gallery and Nature Base are amongst the most heavily visited parts of the museum. As in many big cities, most of our visitors have a fairly basic understanding of the natural world. Many struggle to recognise a house sparrow or red admiral butterfly and if they do, very few know much about them.

Raising our profile

Up until fairly recently, there has been greater emphasis on the provision of learning resources aimed at interpreting our Anthropology and Musical instrument collections, rather than Natural Science. This produced an imbalance in on the ground delivery in the museum and gardens. Perhaps more significantly, this imbalance led to a lack of awareness and understanding of Natural Science and the role and use of our collections and their interpretive value at higher levels within the organisation, amongst Trustees for example. Many were not aware of the scope or role of the collections beyond their display in the historic Natural History Gallery.

Over the past five years we have set out to change this and achieve more of a balance. This has involved gaining support from across the organisation and has been achieved primarily through raising awareness in the following ways:

- By recruitment of new and additional enthusiastic curatorial and learning staff and funding (mostly

- through Renaissance London and also City Bridge Trust).
- Development of new Secondary Science and Gardens Learning and Access programmes which connected themes across the collections, aquarium and gardens such as evolution, biodiversity and environment.
- Establishment of a wider programme of activities and events often linked to larger national events such as Science Week, International Year of Biodiversity or Darwin200 (See paper by Paolo Viscardi for more details on this).
- Establishing a plan and programme for the re-development of the Natural History gallery and Gardens.
- Opening the first phase in this re-development - Nature Base, a new hands-on gallery space and associated website (again funded through Renaissance London and also City Bridge Trust).

Nature Base

We opened the first phase in the re-development of our Natural History Galleries – Nature Base in April 2009. This hands-on gallery was aimed at encouraging our core family audience to explore, get involved with and value real wildlife out there on their doorsteps.

Nature Base takes a multisensory, active and participatory object based approach. Instead of filling the space with examples of every beetle or bird you might find in London, we decided to keep things simple and split this relatively small space into areas that lead to the development of some of the skills needed to become real nature explorers (like botanists or zoologists), so observing, identifying, describing etc. We used a mix of real specimens (some live), a few models and made good use of graphics and interactivity to deliver this (Fig. 1).

Interactivity was kept relatively low-tech, employing many tried and tested techniques, developed to suit our audience. This included an easy-peasy video microscope, a sound interactive including 24-hour wild sounds and other light-touch interactivity such as a match-the-leaves tree key and feely-box. We also included some taxidermy to touch (with ethical issues taken into consideration), as well as participatory activity cards and a wild thoughts response card wall (Fig.2). We also included several live exhibits – an observational beehive, harvest mice and Horniman beetle displays.



Fig. 1. Models and video microscope in the Nature Base Gallery.



Fig. 2. A new open display taxidermy mount in the Nature Base Gallery.

The aim was to keep everything easy for children to reach and use, as well as robust and quick and easy to maintain (Figs. 3—4). We knew we would not have funds for any extensive on-going maintenance in years to come. The gallery had to work as a largely unsupervised space, visitor assistants and some additional assistance from our ‘Engage’ volunteers would provide only partial supervision.

Text

Labels were developed to deliver core information and key messages. The number of labels and associated word counts were kept to a minimum, mostly around 25 words. A series of labels headed ‘Capital Creatures’ were designed to draw attention to ‘special species’ in London, some of those listed on the London Biodiversity Action Plan like stag beetles, house sparrows and bats. For those wanting to find out more, we provided identification guides and books in the gallery. We also developed an accompanying Nature Base website where visitors are encouraged to find out more and participate further.



Fig. 3. The comments cards on the Wild Wall.

Fig. 4. Capital Creatures labels highlight the significance of some London Biodiversity Action Plan species.

Nature Base website

As we were not able to include everything in the Nature Base Gallery and knowing that we wanted to make some real links between the indoors and outdoors, we developed our Nature Base website to fill the gap (Fig. 5). The site was aimed at our core family audience and aligned to the Nature Base gallery with its focus on encouraging visitors to get involved in observing and recording nature.

This is an ongoing web project, the timescale from the first kick-off meeting until the live launch of the site was just under a year. The project was managed internally but the design work was tendered for and a web design company recruited for the design elements.

This was a very new venture for the museum, we had not developed a site specifically aimed at a family audience before. We consulted with families at the museum to inform the look and feel, as well as the content before the work started. This was done by recruiting families with children aged 5-11 in focus groups. The family focus group revealed the following:

- Keep it simple and text-light
- Short, interesting facts about species were preferred
- Adults had different perceptions of what the children would like!
- Children were most keen on games and interactivity but were more interested in facts than the adults thought they would be
- They loved the characters!



Fig. 5. The Nature Base website homepage. www.horniman.ac.uk/naturebase

Part-way through the development, we also conducted some user-testing with our after-school museum clubs. This also revealed that:

- Navigation needs to be extremely simple for a younger audience (we introduced a left hand navigation after the site was first launched)
- The games were the most popular element
- They loved the characters!

Our internal discussions about the look, feel and appeal to the family audience, particularly the use (or not) of characters based on our feedback were particularly interesting. We expected games and interactivity to be popular with young people and this certainly rang true. The focus group research was particularly illuminating, when it came to the tone and comprehension of the text. Although, as expected, the children had a low attention threshold for text longer than one or two sentences, they were much more interested in the factual information than their parents (or we) thought they would be.

At the moment the site has three core sections – **Visit Nature Base**, **Help Record Wildlife** and **Become a Nature Explorer**.

The Visit Nature Base section replicates some of the Nature Base gallery online (Fig. 6). It contains images of all of the specimens in the gallery and brief information informed in tone and content from our focus group research. The initial plan for this part of the site was to provide somewhere for people to find out more after a visit to Nature Base. Anecdotal evidence, however, based on conversations with teachers and families on facilitated sessions at the museum, suggests that this part of the site is also useful for visitors to orient themselves with the space before they come. We aimed to use visual clues for the navigation – click on the images to get more information.



Fig. 6. The Nature Base website showing the animals which can be seen in the Nature Base Display.

Help Record Wildlife

The central section is a wildlife survey (Fig. 7). Visitors can find out about the species we want them to look for and download a colourful survey form. This element of the site was developed in partnership with ‘Greenspace Information for Greater London’ (GiGL), London’s biological records network, they collect and manage data on behalf of London’s green spaces. This has been a really fruitful partnership. Our site links to the GiGL database, so recorders can input their survey results. This means that visitors are getting involved and contributing to the bigger picture of wildlife recording both locally and nationally which has been a really important drive for the whole project.



Fig. 7. The Nature Base wildlife survey, run in partnership with ‘Greenspace Information for Greater London’.

Explore Nature

The final section encourages people to become nature explorers (Fig. 8). We used the three characters to represent different types of explorer – bird, plant and minibeast explorers. The user can choose which character they want to follow. This area of the site is the most interactive and contains photo galleries, challenge sheets to download and games and quizzes.



Fig. 8. The minibeasts Explorer page on the Nature Base website.

Games - Batsense

Games proved really popular. Initially we developed some simple, low-cost games in a quiz format (e.g. identifying birds from their song). Later on, we received additional funding to further develop a game for the site and decided to create an interactive flash game in an arcade style. The player is a bat who must successfully navigate owl and cat predators in an urban landscape, catching insects for energy along the way (Fig. 9).



Fig. 9. The online 'Batsense' game on the Nature Base website. The user navigates the bat through different obstacles and predators to catch insects.

This was a fairly substantial piece of work and involved tendering for a web games company. We are still conducting evaluation on the game but it is receiving a high number of hits when compared with other pages on the site, so we know that it is popular with those using it.

Lessons Learned – Nature Base

- Audience – Nature Base was aimed primarily at families with children aged 5-11. However, the impact and frequency of visits by under 5's and accompanying parents has increased significantly in recent years. We developed activity cards for the older age group - counting bees or mice watch for example. However, we soon discovered that most of these would get scribbled on by the younger visitors. We have now switched to using these cards mostly with school groups which have proved more successful.
- Seasonal changes are hard to keep up with – the gallery was designed with some easy to change areas, so that specimens could be rotated easily or provide an opportunity to respond quickly to a topic of interest. The reality is that due to constraints on staff time, this has not proved as dynamic or quick to deliver as we would have liked.
- The touching taxidermy mounts didn't wear nearly as long as we expected in an unsupervised space. Smaller mounts proved just too vulnerable to the sheer volume of handling by young visitors in the space. Increased supervision by our 'Engage' volunteers and 'please be gentle with our objects' signs have helped alleviate the problem to some degree but not entirely. We now plan to case the smaller mounts and maintain a level of multisensory access to the large mounts – fox and badger, which are more robust.
- Live exhibits – whilst the honey bees and harvest mice have been relatively easy to maintain, our colony of Horniman beetles (aimed at linking an African species named after our founder to beetles you might find in the local environment), failed to establish in the tank and this has been empty for much of the time. Our aquarium team are currently investigating how best to resolve this. This does highlight how unpredictable some live displays can be, regardless of how much time and effort is put into research and consultation along the way.

- Website – this almost took as much time and resources to develop as the physical gallery, writing text, sourcing images, writing briefs and working with designers all took careful planning, teamwork, occasional compromise and time! Our aims and ambitions for the website were high and we soon realised that we could only deliver some of this if we were to coordinate our launch in time for the gallery opening. Entering the world of web designers and game developers was also a new experience for some of us. We would like the website to be more dynamic and more regularly updated and have learnt to appreciate the demands of this on staff time - there's always a new project that needs more urgent attention. We also need to think more carefully about sustainability in the future.
- Marketing – the website needs to be constantly promoted to draw traffic to the site and encourage people to participate in our wildlife survey. The website is promoted in the Nature Base gallery and during activities and events but we could still do more. Marketing needs to be more continual especially during the summer months. Promoting the site via the web and through linking to other sites also needs greater prioritisation.

Positive outcomes

Nature Base gallery – Many thousands of people have visited Nature Base since it opened last year. It is a popular, interactive, up to date family friendly space where families can participate and discover more about wildlife in their local environment. It is often cited as one of the most memorable parts of the museum visit. Nature Base has contributed to the museum achieving its highest visitor figures during 2009-10. The gallery is successful at holding visitors attention and the range of interactivity and the opportunity to get up close and hands-on is key to its success.

Visitors often spend long periods in the space, viewing specimens on the microscope, watching the live bees and harvest mice, drawing pictures of specimens or wildlife they've seen for inclusion on the wild wall (Fig. 10). It has also brought about visible changes in visitor behaviour. Some of our gardeners have noticed children collecting items that are displayed in the gallery in our Gardens. Viewed positively, this means we are having some success in developing skills and interest in exploring nature outside.



Fig. 10. A selection of comments cards from the Wild Wall provide informal visitor feedback.

Nature Base website - Developing the website has provided an opportunity to trial a new approach to developing websites at the museum – a more child-centred look and feel, the use of games etc.

The site is being used. We have had 15,341 unique views from September 2009 to May 2010. Visits to the website and active participation through the wildlife survey show an upward trend. We have developed a very successful ongoing partnership with GiGL, with local people submitting records and contributing to the wider conservation agenda. We have also found that content is transferable across our school and community audiences.

School & Community Programmes – The development of content for Nature Base and Nature Base website have also fed into some of the programmes that link our indoor and outdoor collections for our school and community audiences. Favourites have included building woodlice mazes, welly and story walks, and opportunities to do some planting. Also popular have been those sessions which combine learning with games and physical play, for example, using our enormous parachute.

So, did we raise the profile of Natural Science?

Yes we did. It is clear that the Nature Base gallery and website as well as other new programmes have raised the profile of Natural Science across the organisation. Our Trustees and other external bodies now know more about the collections and gardens and their potential for engagement and increasing knowledge and involvement in Natural Science and now regularly shout about it from the green rooftop too...

Acknowledgements

Nature Base was designed by Ralph Appelbaum Associates Ltd. Nature Base website by Space & Time Design and Batsense by Cimex. To find out more about Nature Base and our other Natural Science programmes visit www.horniman.ac.uk

Wild about Plymouth: The family friendly natural history group in Plymouth

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Introduction

The city of Plymouth is one of the greenest cities in the UK, with over 33% greenspace, as well as being surrounded by an incredibly beautiful variety of natural environments (Fig 1.). In 2005, Plymouth City Museum and Art Gallery (PCMAG) and the School of Biomedical and Biological Sciences at the University of Plymouth (UoP) began discussions about jointly developing family friendly natural history events. PCMAG and the UoP had previously carried out collaborative *ad hoc* events for school groups and some for families during school holidays. It was recognised that there was a gap for the people of Plymouth to enjoy informal, engaging natural history events.

The group was set up as a pilot under the branding of *Wild about Plymouth* (WaP) (Fig 2). The team co-ordinating the events, the WaP Team, included a member of staff from the UoP's School of Biomedical and Biological Sciences and staff from PCMAG (including, the natural history staff, an education officer, and the marketing officer), as well as several dedicated, enthusiastic volunteers. The aims of WaP are;

- to create once a month family friendly natural history events using sites in and around the city of Plymouth.
- to develop a variety of natural history events which are accessible to all.
- to develop partnerships in the city.

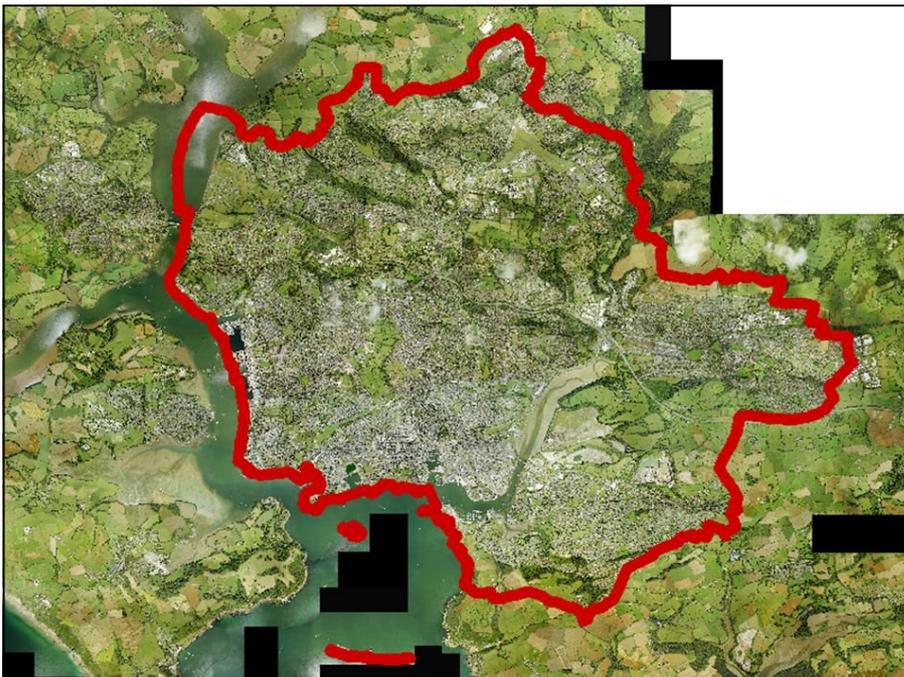


Fig. 1. Aerial image of the city of Plymouth, highlighting the large areas of greenspace.

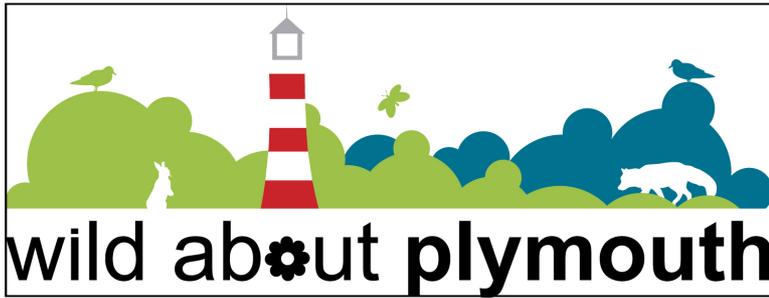


Fig. 2. The branding logo for Wild about Plymouth.

In the beginning

To pilot the WaP events, PCMAG and the UoP organised four events in 2005/2006, supported by funding from *Renaissance in the Regions*. The events included a spring walk in one of the city’s nature reserves, peregrine watching, a bug hunt, and a boat trip along the shores of Plymouth. The first leaflet to promote the events was very basic, and formatted by PCMAG natural history staff (simply, a photocopied double sided leaflet on A4 paper, see Fig. 3). The marketing campaign was minimal, but was also supported by local radio interviews and press releases in the local paper.

The pilot events were very popular and introduced members of the public of varying ages to the diversity of a small selection of wildlife on their doorstep. Staff from PCMAG and UoP were present at each event, supported by staff from partner organisations and keen volunteers. These ‘expert scientists’ were engaging and interacting with the attendees, and were very approachable, explaining the science in a clear non-jargon way without ‘dumbing down’. Experts on hand at these trial events proved very popular with the parents and children, and the public felt comfortable asking questions to find out more information.

Planning ahead

After the success of the pilot events, the WaP Team developed the next programme of events; the WaP programme would run from September to July, fitting in with the academic year and providing a break over the summer holidays. The team planned six months of events for the first part of the programme. Each member of the team organised one or two events and liaised with partners; this worked well to share the planning and the event risk assessments with the WaP Team and the partners. The WaP team discussed dates of the events and arranged who would be present at each event.

With a firm budget set up, a glossier leaflet was produced for the six events in 2006 (Fig 3). A second leaflet was produced in February 2007 for the next five events. The leaflet costs were high, particularly producing two leaflets for one year. The 2009/2010 programme was trialed with all eleven events on one leaflet. This worked well, as partners often needed advance notice to book in events, and substantially reduced the costs of the leaflet printing.



Fig. 3. The old and new. Above left, the first WaP leaflet produced at a very low cost, designed by the WaP Team, and printed on double sided A4. Above right, the next glossy WaP leaflet, planning events more into the future. To further reduce costs, one leaflet for the year programme of events has been produced.

A range of events for a range of audiences

Since the beginning, WaP has offered a wide variety of events to illustrate the diversity of natural history in Plymouth, and encouraging members of the public to become engaged and explore the natural history on their doorstep. The programme has had, and continues to provide, a mixture of biology, botany and geology events (Table 1), which are organised across different sites in and around Plymouth. During winter months, however, some events are held indoors (either at PCMAG or the UoP) as weather becomes a major factor. Where possible, real specimens from the natural history collections have supported the events and the activities to promote PCMAG’s collections.

In the beginning a few of the free WaP events had very few attendees turn up; the events required booking form, and although the form had thirty or so people booked, the number of those that actually showed up to the event was drastically lower. Since then, the WaP team added a small ticket cost for some events to see if it would affect attendance (£2 per adult, £1 per child and under 5’s go free). This system worked very well, with 95% of those that booked and purchased a ticket turning up the event. This additional income generated through ticket sales has also assisted in further resources and goodie bags for the families at events.

Biology Events	Botany Events	Geology Events
Bug Hunt	Edgcumbe Explorers	China Clay
Dawn Chorus	Fungi Hunt	Ford Park Cemetry
Dusk Adventure	More Tees with Moor Trees	Naming Nature
Fishy Goings On	Naming Nature	Night at the Museum
In Darwin's Footsteps	Night at the Museum	Riches beneath our Feet
Insect Art	Tudors and Tussie Mussies	Rock around the City
Making a Splash	Woodland Walk	Tales from Darwin
Moths go Batty	Woodland Wander	
Naming Nature		
Night at the Museum		
Seashore Saffari		
Summer Splash		
Winter Waders		
World of the Small		
Wriggly Wrascals		

Table 1. A list of biology, botany and geology based events for WaP. Note: some events cover all three disciplines, such as ‘Naming Nature’ and ‘Night at the Museum’.

The age range of the audiences have varied at the events and it is unpredictable from year to year (Fig 4). The events in the museum (such as ‘Night at the Museum’, ‘Insects in Art’), bug hunts and seashore safaris, generally attract family groups with parents and children under 10 years old. More specialist events, such as ‘Fungi Hunt’, ‘Dawn Chorus’ and ‘The Barbican Fish Market’ attract an older interested audience. To maintain the variety of audiences and not to exclude the older audience, at least one event is planned in each programme targeted for this audience. These more specialist events are bookable with a small fee, to help cover the costs and to ensure that people attend.

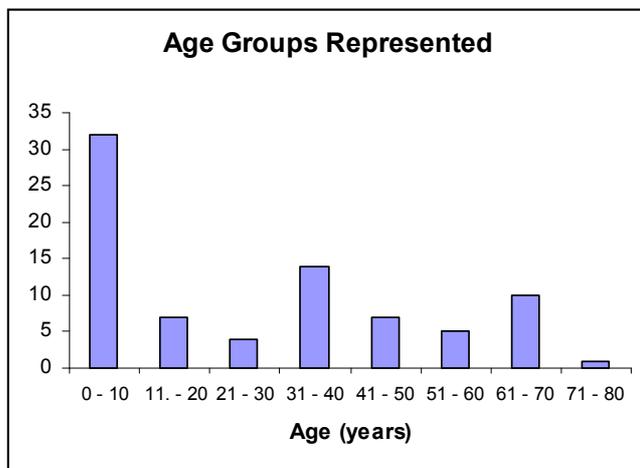
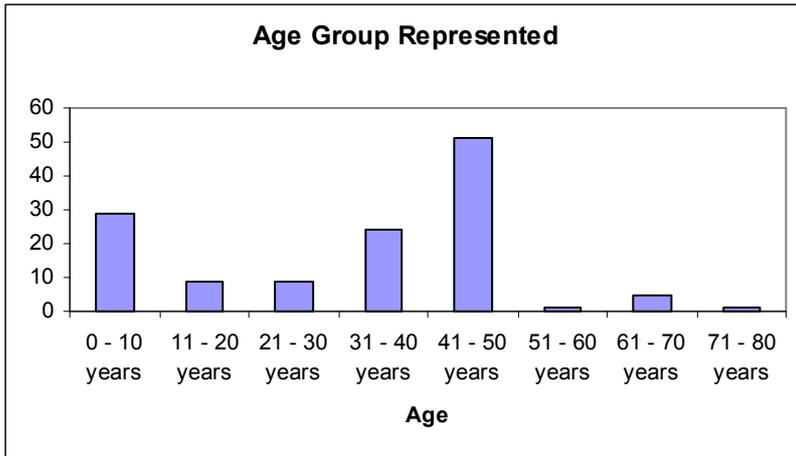


Fig. 4. Graphs of age ranges from 2008 (top) and 2009 (left). Both graphs illustrate a variety of audiences for the two years, with varying ages. The family audience (0-5yr olds and 31-40yr olds) remains consistently high for both years. (Graphs adapted from Freedman, 2008 and Freedman, 2009).

Costs for WaP

Cost associated with WaP have dramatically decreased since the initial set up (Fig. 5). This reduction has mainly been due to a number of factors;

- Producing just one yearly leaflet to advertise the programme of events.
- The initial set up costs were relatively high to build up reusable resources, such as nets, magnifying lenses, pencil crayons, etc. T-shirts were purchased in the first year for staff members and volunteers, so the attendees knew who to ask if they had any questions.
- A small fee charged for some of the events; this income generated is transferred back into the budget.

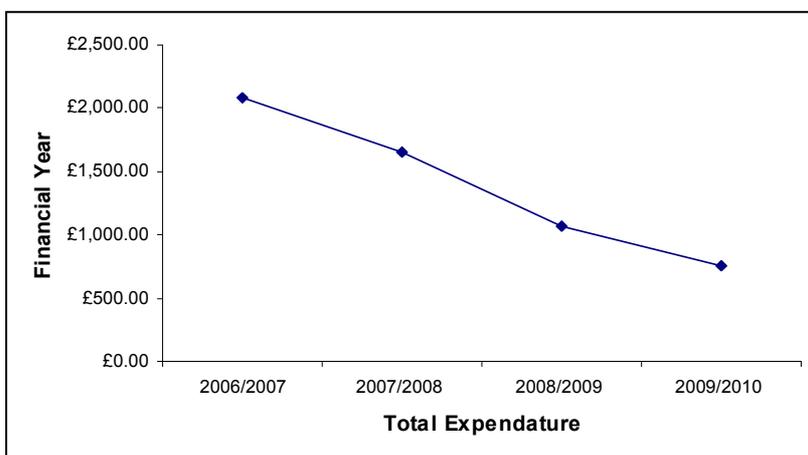


Fig. 5. Since WaP was set up in 2006, the WaP Team have continued to reduce costs. The production of one leaflet for the programme of events and the build up of resources has greatly reduced the costs. (Graph from Freedman, 2009).

The overall cost per visitor ratio has been noticeably reduced (Fig. 6). This has been a result of minimising the costs, and higher attendance figures. The attendee figures have increased from 531 attendees in 2007/2008 to 1797 attendees in 2009/2010. (2009/2010 had four events at PCMAG, with high attendance figures, whereas 2007/2008 had no events held in PCMAG). WaP does have a number of return visitors to events and this has often resulted in the returning families bringing another family along.

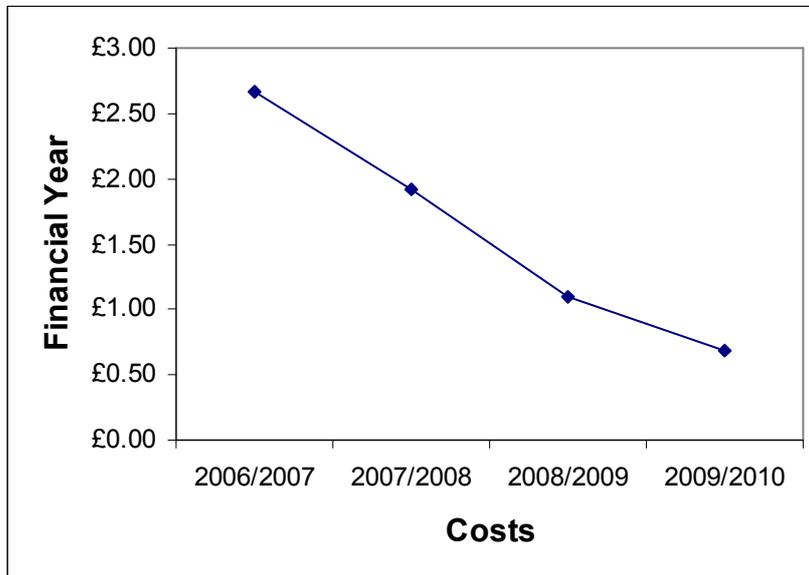


Fig. 6. The cost per visitor ratio has dramatically been reduced from £2.66 –to £0.69. (Graph from Freedman, 2009).

This graph does not take into account staff time, which has also shown a decrease in cost per visitor from £5.73 in 2006/7 to £2.40 in 2009/10.

WaP in and around the city

Events are organised in as many different locations in the city as possible, to provide a variety of sites and to reach as wide an audience as possible. Using *Google Maps* to analyse the postcodes of where the events have been held, areas in the city that have not been used can be highlighted; future events can be planned with this in mind and organised to fill in the gaps.

Partnerships

Several new partners across Plymouth have become involved with the WaP events. This has been extremely beneficial for assisting in organising the events; by saving time, producing additional resources and adding extra expertise for the event. Over the last few years, many organisations have begun to host natural history events in Plymouth, and discussions with many partners have suggested that it is incredibly advantageous to join together to organise and run the event. The partnerships have been successful at promoting all organisations as well as offering a greater experience for members of the public.

Evaluating WaP

Evaluation is carried out at every WaP event. (An example template questionnaire can be seen in the Appendix on page 37.) The results are compiled and written up at the end of the calendar year, with comparisons to previous years, recommendations and future developments. All questionnaires from an event are photocopied and sent to the event partner, so they have a copy of the feedback. The questionnaires provided the opportunity for attendees to make suggestions to improve the event, or suggestions for future events.

The questionnaires were devised to fit the Generic Learning Outcomes as set out by the MLA. This method provides a standard of evaluations and looks at the comments made by members of the public in relation to what they have learnt, if they enjoyed the event/activity, if it changed their attitudes, if it gave them new skills and if it has changed what they will do in the future. Some quotes from past evaluation relating to the GLOs (from Freedman, 2009);

Increase in Skills, Knowledge and Understanding

- “About the context (social and historical) for Darwin’s work.”

- *“About Dragonfly larvae before they become proper Dragonflies and that they eat tadpoles and fish. Caterpillars, and spiders and their webs protecting their babies.”*
- *“Tailless whip scorpions are part of the arachnid group like spiders and they shed their skins like snakes.”*
- *“An appreciation of the Georgian architecture – Darwin’s connection to Plymouth”*

Enjoyment, Inspiration and Creativity

- *“The whole experience – seeing so many people interested in the environment. Great for kids!”*
- *“That everyone was very welcoming and encouraging and activities were fun for all ages.”*
- *“The orienteering was not as easy as we thought it would be – so it was a more enjoyable challenge.”*
- *“Enjoyed looking at the different things that you don’t get chance to see up close normally.”*

Activity, Behaviour and Progression (providing valuable feedback for planning future events);

- *“Cramped seating at the film, more space needed between rows as children swing and kick their legs, kicking the seats in front.”*
- *“Too much waiting around in the cold.”*
- *“The time was too short that we don’t think it was possible to complete the tasks.”*
- *“More pond-dipping nets.”*



Fig. 7. An interesting find at one of the WaP sea shore safaris. The children, and parents, at the events have a very hands on experience! (Photo reproduced with permission).

Summary

WaP is continuing to engage, empower and educate the families of Plymouth to explore the natural history on their doorstep. It continues to be a successful programme of events and has new partners offering ideas for future events throughout the year. The key points that have been learnt and continue to make WaP successful are;

- Building up a stock of **resources** that can be used for future events. WaP has been extremely fortunate to have been allocated a supporting budget from funding via *Renaissance in the Regions*, but this funding could be cut at any time. Planning for the future will safeguard WaP against uncertainty over budgets.
- Through the few years since the initial set up, the WaP team have successfully minimised **costs** year on year. The initial set up costs were high due to purchasing new resources, leaflets, T-shirts, etc. Building up resources, printing one leaflet for the year's programme and working with more and more partners has successfully reduced overall costs.
- Developing the programme of events to be as **varied** as possible to include many different themed natural history events has been popular and encourages attendees to come back again. The questionnaires allow the opportunity for the public to suggest future events, and these are considered by the WaP Team.
- Adding in a small **booking fee** to an event has assisted in covering costs, and will allow WaP to be more sustainable in the future. Another positive effect from adding a small booking charge, is that it ensures that people do turn up to events.
- **Partnership work** has been key to the success of WaP. Networking with old and new partners to help develop ideas and work together has been very important. Working together has promoted the museum to new audiences in different parts of the city, and has halved the amount of time to organise an event. The additional expertise offered from the partners ensures that the events continue to be of a high standard.
- **Evaluation** at each event has highlighted areas which people have or have not enjoyed. Compiling the questionnaires into an annual evaluation has been very important for organising future events, promoting WaP to the rest of the museum staff, and assessing areas for improvement.
- When planning the events, make sure they are **simple** and **fun!** The staff enjoy the events and this ensures that the public enjoy them too!

Appendix 1 (Overleaf): A sample questionnaire to assist in evaluating the Wild about Plymouth events. The questionnaires are filled in with the information about the event and handed out to attendees on the day.

Acknowledgements

The WaP team would like to thank all the partners who have helped make WaP a success for the people of Plymouth. A large thank you to *Renaissance in the Regions (SW)* for the support and budget over the previous 3 years. Finally a huge thank you to the staff and volunteers at Plymouth City Museum and Art Gallery and the University of Plymouth for their continued support and enthusiasm to help WaP be successful.

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Wild about Plymouth:

<http://www.plymouth.gov.uk/museums/museumwildaboutplymouth.htm>

MLA, Inspiring Learning For All: <http://www.inspiringlearningforall.gov.uk/toolstemplat/genericlearning/>



wild about plymouth

[Event title]

[date]

Thank you for coming to our event today. We would be grateful for your feedback, so we can continue to offer events that all our attendees enjoy!

Name: (optional) **Age:**

Postcode

Have you learnt anything new at this event? What did you learn?

What did you and your family enjoy and why?

What did you and your family not enjoy and why?

Is there anything we can do to make our events better in the future?

Has this event increased your interest in [insert phrase relevant to event] in Plymouth?



**RENAISSANCE
SOUTH WEST
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WILD ABOUT PLYMOUTH
wildabout@plymouth.gov.uk
www.plymouthmuseum.gov.uk

Volunteering flagship at Leicestershire County Museums

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Background to Leicestershire County Council Volunteering

Volunteering in the Environment and Heritage Sector has always taken place, but in the past mainly in an *ad-hoc* and un-tracked manner. In 2006, work was undertaken to assess the level of volunteering across these service areas to identify the nature and scope of opportunities, and to try to identify gaps in service provision. The work identified a number of volunteer types:

- Benevolent/altruistic volunteer – ad-hoc or regular duties around a subject or site,
- “Virtual volunteer” – the home-based volunteer
- Event volunteer - conservation tasks, employee volunteering opportunities
- Member of Friends group - associated with a particular museum/ project
- Full time/part-time placement - students from university/volunteer secondment, school/sheltered placements
- Arms length/remote – Wardens in their own communities

The assessment, supported by additional work in 2009 around the Natural Life Collections, looked at barriers to volunteering both from potential applicants and also staff. For some people expenses are an issue, although many choose not to claim what is offered. However, almost without exception, volunteers do like tea and biscuits and recognition! Expenses are now offered at 40p a mile, or public transport costs.

In summary, people volunteer to

- Gain new skills
- Gain work experience
- Have the chance to make a difference
- Meet new people
- Have fun
- Follow a passion for their field of interest – and share it!
- Build confidence

As an outcome of this work, a bid was made to the local Museums Libraries and Archives office in 2007 for pilot work to establish a “Community Services” Volunteer Co-ordinator and standardise processes to meet best practice guidance. This work used existing Induction and Staff Guidance packs developed for museums, along with national guidance, and new updated and enhanced guidelines and information for staff were produced. It has also standardised processes and procedures across service areas and co-ordinated approaches for museums, arts, heritage, environmental and library services. The post of Volunteer Co-ordinator is supported by a network of Service Champions. Staff receive regular updates, standard literature and training opportunities for recruiting and supporting volunteers. This support has resolved many staff concerns identified. In addition there is a central volunteers’ expenses budget.

It is now known across these service areas that there are over 200 regular volunteers every year, plus many more Friends groups, work placements and community wardens. In a 45 week reviewed period, almost 19,000 volunteer hours were provided to support these services. With the average Leicestershire wage being £11.83 (UK average of £12.55 per hour) this equates to nearly £250,000 worth of time gifted.

In March 2010, many of the Natural Life volunteers joined an afternoon cream tea reception hosted by the Chairman of Leicestershire County Council. This is part of a recognition package for volunteers developed by the team. The Natural Life volunteer team are also being put forward for the Corporate “Star” Award that acknowledges volunteer contribution.

Formal volunteering is defined as “giving unpaid help through groups, clubs or organisations which support social, environmental, cultural or sporting objectives”. (Source: *Briefing note for Local Strategic Partnerships: NI6 “Participation in regular volunteering”, Cabinet Office*)

In the Communities and Wellbeing Service, where museums are now based, the total revenue budget is approximately £10m. This means external funding is critical. £13m has been secured through challenge funding for heritage and arts over the last three years, providing 86% of total project funding. This equates to 27 projects currently, much covering non-statutory functions, so volunteering can bring much added value to these bids that ask for “volunteer contributions” as matched funding. Indeed the VIP (Volunteering, Internship and Placement) project in North West Leicestershire has received funding through the Local Area Agreement board.

Volunteering Flagship at Leicestershire County Council Museums Collection Team

The Collections Resources Centre provides a unique resource for volunteers to work with museum collections outside museum sites. Volunteers in 2009 worked within Archaeology (five registered), Costume (five registered volunteers), Fine Art (one registered) and Natural Life (thirty two registered).

The Natural Life (NL) Collections Team, based at this site, has been keen to engage greater numbers and improve the volunteer experience, through training and new approaches to collections care and management. Previously collections focused volunteering had been at the curator’s discretion and on an *ad-hoc* basis – often restricted to local naturalists. Just two people volunteered on an occasional basis. However:

- Volunteers are changing
- There is a need for the service to diversify our workforce bringing new skills to our teams
- We need to reach out to our local communities
- Volunteers have higher expectations

Volunteering opportunities available with the natural history collections have received a boost as the Centre has been awarded Renaissance East Midlands Volunteering Flagship status at the start of 2010. In recognition of work championed by the Natural Life Team and development of best practice approaches to policies, support mechanisms and recruitment methods developed in recent years. The Centre’s application and initial assessments for the baseline have indicated that the service works to a high standard and meets the good practice standards required.

The Flagship award will allow developments across the various subject disciplines of the whole Collections Team and regular inter-disciplinary volunteering days, as well as subject specialist tasks. This will benefit volunteers through peer-to-peer learning, diversification of opportunities and greater training opportunities. A small pot of money can be bid for as part of this programme and will be used to enhance the “volunteering work space”.

Part of our work plan for the future is to share what we have learnt, broaden our offer working with colleagues across the Collections Resources Centre, as well as to learn from others who work with Natural Life Collection volunteers.

Natural Life Volunteering

Pilot work with Natural Life collections has shown there is significant opportunity for growth and development of the volunteering opportunities on offer. This highlighted opportunities beyond subject specialist interest, and new approaches. A good example of this is our home-based volunteers (whether excluded due to rural location or personal circumstance).

Natural Life headline outcomes between April 2009 and April 2010

- Registered 32 new volunteers working from home, at events, or directly on the collections.
- Volunteers contributed over 2,300 hours on work related to the Natural Life Collections.
- Over half of this time has been at the Collections Resources Centre, working on collections man-

agement for just 2 days a week.

- The national average hourly wage (£12.55) means this equates to a donation of £28,865.
- Advertising for volunteers was only via two local newsletter articles, although role descriptions are clearly defined and advertised on the Do-It! web site (www.do-it.org). and also through local Volunteer Centre Networks and the volunteering pages on the LCC website.
- Many volunteers have come forward following on from events with the Collections team, word of mouth, or promotion of the collections in local media, web etc. Indeed a number of our volunteers are now contributing tales of their experiences on our Curator's Blog.

Working with the collections is not just about the specimens alone. Volunteers have brought their skills and added value to what we do. Their assistance and enthusiasm has helped us to provide greater access and opportunities for local groups and the public alike, unlocking archives and discovering stories behind the specimens. All of this has helped enhance the collections, bringing new audiences to the heart of museums.

The Library

The Natural History collections are supported by a comprehensive library collected since the 1850s. It has a wide range of books, journals and papers from technical research to “coffee table” informative books. Serious researchers and school students alike get inspiration and information from this extensive resource.

Volunteers, including trained librarians, have driven the work on the library (Fig. 1). It has been moved nearer the collections, and ordered by the Dewey Classification System. Books have been assessed for restoration and are now being fully catalogued on Mimsy XG, the museums cataloguing system. Since September, once the moves/ordering were complete, nearly 500 books have been added to this catalogue, working on it one day a week.

A volunteer book-binder has assisted with restoring books that have displayed signs of wear and tear. She volunteered, having seen the books at a visit, and hearing our desire to see them restored. Working from home, since May 2009, nearly 20 books from the 19th Century collection have had binding stabilised, spines restored, gold-leaf text of the title added and loose pages re-inserted. All the work is photographed, helping us document the care of this archive.



Fig. 1. Volunteers are helping catalogue the extensive library that support the collections.

Another volunteer is fluent in several languages. This has helped us provide abstracts for foreign journals and publications bought by past curators and collectors, which helps unlock information and makes the library and resources further accessible.

A bonus has been people having a chance to look through the hundreds of books we hold. This means not only are they health checked, but interesting illustrations and annotations book-marked for use at tours. This work on the library has been the inspiration behind bids to a local society that has surplus money, and to local Charitable Trusts, which would allow us to develop a fund to purchase current specialist identification books for use by County Recorders with the collections. It would also fill gaps in the Leicestershire historical and contemporary wildlife/naturalists bibliography, a list that has been compiled by local naturalists.

Photographing the Collections

Following an article in Branchline, a local heritage newsletter, about the developments within the Natural Life team and volunteering opportunities, a local photographer contacted the team in June 2009 offering her assistance in digitally photographing aspects of the collections. As a busy mum, she joined the team after the summer holidays, with her friend (also a keen photographer). Joining the team once a fortnight, they have photographed 1,800 images from the flowering plant herbarium.

A home-based volunteer then works to rename the images with the plant's scientific name, and to catalogue the data from the specimen labels. This means their time is best used to make maximum benefit of their skills in capturing the images. This process is unlocking a vast amount of information about this collection in a new format.

This approach has since been taken when working on other collection areas, such as zoology, and also, how as a Centre, we utilise the photographic suite.

Collections Care

A volunteer team has developed since April 2009 that assists with "health checking" the collections. This helps us maintain the high standard of care. Each week (using an Excel random number generator established by a volunteer!) they select cabinets from the zoology collection to check for signs of physical damage, pests, or issues with pins that hold the fragile insects. This is then catalogued in cabinet note books (prepared by a home-based volunteer) and an electronic archive that also documents remedial work collated (the latter being done by one of the volunteers to ease pressures on the PCs on the days they are in). They also undertake weekly store vacuuming. This has freed up the Curator's time for specialist projects, but also links to their work programme of remedial work by providing a targeted action plan.

The team have helped with general tasks which include reorganisation of archives and stored resources, such as publications, consumables and equipment (Figs. 2-4). They also are keen to help re-file and catalogue additional material and documents in all the history files relating to the collections. The Volunteer Collections Care team has:

- initiated an archive of what is held in the cabinets;
- cleaned the glass on over 750 cabinet drawers – twice!
- bagged and frozen over 2,000 higher plant specimens;
- repackaged and cleaned the reference collection of UK bird and mammal skins (and written procedural guidance notes for future volunteers);
- helped produce a catalogue of all specimens that relate to protected species lists;
- re-packed geology specimens that had signs of pyrites decay;
- re-organised the teaching taxidermy collection into scientific checklist order, during a house keeping day (where we buy the volunteers fish and chip lunches!).



Fig. 2. Volunteers have generated project ideas such as re-packaging and cleaning the zoology skin collections.

As a weekly “fall back” task the team also assist with producing an index for the Personalia files (documents about local naturalists and collectors). This then identifies key documents that might be suitable for the home-based volunteers to fully transcribe or research.



Fig. 3. Volunteers assisting with general collections care, including spot checking specimens for pests.



Fig. 4. Volunteers assisting with general collections care, and updating documentation of specimens.

Specialist Collection Work

A number of local naturalists (including County Recorders, who have special interest in a particular wildlife group) have also volunteered to work on the collections, assisting with specimen identification and documentation of data from the specimen labels. In the past naturalists had primarily visited for identifications, or used the collections as a reference. Whilst this added value to the collections, it was not volunteering! We have targeted this group through visits and talks at AGMs, County Recorder Network meetings and local conferences etc.

We now actively encourage their assistance in re-identifying/determining specimens and re-curating groups to new checklists. This work has allowed the data from the specimens to be captured and can then be passed

to the County Recorders and colleagues at the Historic and Natural Environment Team, who have an interest in Leicestershire wildlife records (Fig. 5). Again, volunteers working at home often assist with transcribing this data.



Fig. 5. Local Naturalists (including County Recorders) assist with curation, specimen identification and documentation of data from the specimen labels.

Volunteers have assisted with Lepidoptera (butterflies and moths), Tipulidae (crane flies) and Hymenoptera (bees, and wasps) collections. Some of this work has included taking specimens from the store boxes (the way collections are donated to the service by collectors, or transferred at disaggregation in 1997) and migrating them to the main collections. This makes them more accessible to local naturalists. We can also identify specimens with no data, or where we have an excess, for use in handling, teaching or displays.

Following on from this initial work, local naturalists are now coming forward with ideas. A project has just begun to compress the storage of the smaller insect orders, where gaps have been left for future specimens (so we may only have a handful of specimens in a Hills Drawer). This will allow space to be created for transfer of future collections from the store boxes. This is a more efficient use of space, important in the current financial climates where cabinets will be harder to purchase.

Volunteers have also formed a “sub-group” that want to re-vitalise the spirit collections, currently on-loan for storage reasons to Leicester City Museum Service. This will involve cataloguing in greater detail and any “top-up” needed.

An additional outcome of the increased activity has been increased awareness of what we have to offer, so leading to increased use. In addition local naturalists are now volunteering to run identification courses using the collections. This donation of time is important and tracked too as a volunteer donation.

Home based Volunteering

Leicestershire (excluding Leicester City) is a 70% rural county and not everyone can physically get to the Collections Resources Centre to volunteer. Home-based opportunities can overcome physical and mental well-being barriers, providing greater opportunities. Often volunteers will come and meet the team at the Store, but we often travel, or arrange to meet them at a convenient time/venue or event. This effort to meet them has been identified by the volunteers as being important.

Also many people who would like to assist the work of the Leicestershire Museums Service are in paid employment and can only attend evenings or weekends. Often they become “Event Volunteers”, who help take collections to local events and heritage/countryside shows (Fig. 6). In 2009, this meant the collections were seen by nearly 3,500 people visiting the Natural Life Collections stand and asking specific enquiries.



Fig. 6. Volunteers helping out at a countryside show, promoting the museums collections.

Home-based volunteering has been piloted by the Natural Life Collections team, in response to the interest raised through publicity in the spring of 2009. Home-based volunteers are a vital part of the Natural Life Volunteering team. Volunteers have assisted with:

- transfer of label detail records from paper-based transcripts to electronic archives;
- transcribing of hand-written/printed historical documents to electronic formats;
- re-organising slide archives;

- designing a contacts database that allows us to track bookings for events, enquiries and also volunteering hours;
- preparing lined unit trays for holding insect specimens;
- preparing note books for cataloguing the Natural Life cabinets;
- renaming digital images;
- researching the value of library books;
- research on various topics from local naturalists to interpretation for exhibitions and events!

Some tasks have been specific opportunities based on the interest and skills of volunteering offers. An expert volunteer with specific interest in the Carabidae (ground beetles), working from home in Warwickshire, donates at least half a day a week to document, clean and re-mount specimens from the main reference collection. Rather than paying his expenses, since he is registered disabled and could not get to the store, we contribute to his broadband access so he can network to use Mimsy XG remotely.

Another home-based employed volunteer heard of the need for covers for the team's teaching trays and osteological (skeleton) collection. These specimens are covered by Perspex domes, which are liable to scratch during transportation or cleaning. Fabric covers have helped protect them in transit and from dust accumulation. Since you then cannot see the specimen, she suggested embroidering the name, so the team can identify which specimens are out on loan. She has subsequently designed covers for teaching trays in Hills Drawers. These covers have generated enquiries from other services. The clear guidance on how to carry these trays also helps to ensure the specimens' safety. She will now volunteer with the Costume Collections Team, helping with preparing covers for their collections.

Following on from this, a volunteer, who is interested in design, has developed packs of guidance notes on caring for the collections when on loan, and signs for when they are being used. Working with the handling collections, a subsequent project was to develop an ideas pack based around creative tasks inspired from the specimens. These may not be priorities, but they add value, and make it easier for us as staff in the longer-term.

Key lessons learnt and thoughts based on the Leicestershire experience

Customer Care

- Do not assume only local experts can help you!
- Remember tea, coffee and a nice packet of biscuits can go a long way in gaining goodwill and giving time for volunteers and staff to get to know each other.
- Find out when volunteers birthdays are and do remember cake!

Being Responsive

- Listen to their interests and see if you can tailor make projects that may not be your priority, but would assist you.
- Let people have the chance to input ideas :- new eyes can lead to new solutions, often more efficient or effective.

Data Acquisition

- Ask for feedback; those comment cards could be a valuable evidence base.
- Ask volunteers to track how much time they do at home and explain why you need this information.

Communication

- Remember to say thank you.
- Do not forget the home-based volunteers, perhaps by a quarterly email of news and annual gathering.

When looking at a role, identify:

- Flexibility – people may not like something when they start – Is there a fall-back
- A task where they can see they are making a difference
- Clear goals
- Variety
- How the task can be broken down to small chunks. Can some be done by people at home?
- Contact with other people. Remember for some it will be their only social interaction
- Resources needed for the task. Make sure you have them so you don't lead to disappointment

The recruitment process:

- If you are looking for a certain skill set, think through the criteria you need and specifics of the role, so you can select people who are appropriate for the role. Could it be done by more than one person if no one person fitted the skill set?
- Have a clear framework for supervision and dealing with problems.
- Do not make it too much like a job application process. People are offering you a “gift”. However do take up references if people are working in the store or with confidential records, for example by phone.
- Use best practice guidance available through Volunteering England and local Volunteer Centres.

The future demographics - What does it hold for volunteering?

- Fewer older people will be volunteering purely for reasons of civic duty and participants (such as those from the post-war generation) will want to be treated as colleagues, not just as workers.
- Volunteering experiences will need to provide fulfilment at a number of levels. Roles must be tailored to suit, with tangible outcomes for all.
- ‘Older’ volunteers will be time-poor, but there will be many more of them. (Analysts suggest by 2023 a larger percentage of the UK population will be over 50 than under.) Breaking down tasks or allowing people to work from home could be a way to provide greater opportunities.
- For volunteers of the future, museum volunteering may be just one of many community roles undertaken. Museum volunteering may have to be slotted into schedules, so flexibility within roles will be vital.
- New approach to volunteering that identifies more tasks and mixing and matching, so people receive fulfilment in terms of their motivation for volunteering, whether it be interest, skills development or leisure.
- Recruitment will need to emphasise how volunteering can be personally fulfilling and the benefits that can be gained. This will require a new way of thinking for some staff.
- Appropriate systems and structures: recruitment (informal) and marketing need to be developed.
- Recognition of the volunteer contribution: inclusive/social and physical needs.
- Recognise we need more younger volunteers and more targeting of younger people. However many younger volunteers have different aspirations. They may want a more ‘laid back’ environment, skills development, the chance to utilise technology, with an outcome that will add value to their employment prospects. A skills-based approach that combines a fun, supportive environment is likely to be an increased requirement.
- An appreciation that successful volunteering is based on a relationship model that sees volunteering as one element within a suite of activities that support the Service’s mission. Volunteers can act as advocates and champions at the community level.

One step back, two steps forward – doing the SSN Shimmy

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Introduction

Subject Specialist Networks (SSNs) were a recommendation of the original Renaissance report and their ongoing relevance has been emphasised through the Renaissance Review, Leading Museums and the National Museum Directors' Conference's (NMDC) recently commissioned survey (National Museums working in partnership across the UK). As articulated in both the MLA's Corporate Plan and Leading Museums, the reinvigoration and ongoing development of SSNs will be instrumental in promoting best practice, raising quality, standards and professional confidence and will "contribute to a process in which all museums foster a relationship based on professional respect." (UK Partnerships Compendium, Mapping Exercise, Pg 41)



Grants for Subject Specialist Networks

Renaissance funded a series of Exploratory and Implementation Grants in 05/06, a second round of Exploratory Grants in 06/07 and a further round of Implementation Grants in 07/08. The MLA, since October 2009 has been investing time and resource into reviewing, stabilising and supporting SSNs with a focus, initially, on 20 SSNs which are deemed to support key subject areas. The MLA is now working to deliver the following areas of support to all SSNs.

1. Grants of up to £10,000

Investment to enable networks to undertake activity that may:

- develop capacity;
- enable organisational development;
- deliver further/wider sector impact;
- engage new audiences or use network expertise to engage with regional improvement priorities, or
- deliver against a networks' plans/ambitions

2. Institutional support

Without strong institutional support, sustainability is significantly compromised. An impact assessment framework will be developed which will begin to identify the physical, intellectual, social, human and cultural capital that engagement in SSNs levers back in to the benefit of the institutions and the collections. It is hoped this will be a powerful broker of stronger institutional support and engagement and enable SSNs to better articulate their value.

3. Website offer

SSNs will continue to be offered free website development and hosting through Collections Link. The functionality of these websites is being reviewed to ensure flexibility in design and function.

4. Administration

One of the key challenges for most SSNs is administering their groups and activities. It is hoped that the SSN Connect portal will offer shared functionality such as professional networking and a payment facility (e.g. PayPal).

5. Communication and networking the networks

An e-bulletin is under draft, which will include examples of good practice and featured SSN activity. An SSN conference is being planned for the autumn.

6. Enabling development and exploiting value

There is significant diversity in governance, scope and impact within SSNs – each able to articulate its own value. Furthermore, those SSNs that have developed organically out of a clear need in the sector have, by default and intent, become most sustainable. Whilst the importance of allowing natural development isn't questioned, an SSN charter will be developed which becomes a benchmark for fledgling organisations to work towards. Mapping SSN engagement into CPD will also be explored.

7. Sustainable funding

Very few SSNs exploit external funding opportunities which often limit the scope and impact of their activity – relying mostly on modest subscription and/or membership fees. The feasibility of offering SSNs access to the online funding database 'grantfinder' will be explored with a view to including funding opportunities in the SSN bulletin.

8. Developing a more corporate approach

By definition, most SSNs are managed by Curators and often find the more corporate functions of their group (such as procurement, marketing, publicity) a challenge. Checklists, proformas and guidelines will be developed and shared. The feasibility of developing a skills bank or specific skills networks will also be explored.

Increasing access to collections through partnerships

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Introduction

It is often estimated that more than 90% of museum collections are in storage, and in many museums these are only ever seen by curators and the occasional researcher. In these economic times it is more important than ever that these reserve collections are used and can prove their worth. At Gloucester City Museum we are aiming to increase access to the natural history collection through partnerships with universities and secondary schools.

Gloucester City Museum and Art Gallery is part of Gloucester Museums Service. We have two museums: the City Museum, which holds the archaeology, natural science and art collections and the Folk Museum, which holds the social history collection. We have 13 full time or FTE members of staff, including two curators, a collections manager, a learning officer and myself, the documentation officer, working across both sites. We are celebrating two major anniversaries this year – the City Museum is 150 years old (although it did not occupy the present building until 1873) (Fig. 1), and the Folk Museum is 75 years old .



Fig. 1. Gloucester City Museum & Art Gallery (Image Copyright Gloucester City Museum & Art Gallery)

The Natural History Collection

The museums service does not currently have natural history curator. The last curator retired more than ten years ago and was not replaced. The natural history collection has not been neglected, but is vastly under-used. It consists of an estimated 60,000 specimens or groups of specimens, many of which are catalogued in old ledgers, but are not yet on the museum database.

The collection includes around 7000 fossils such as the Drybrook (Forest of Dean) fossil plants, the Hornsleasow dinosaurs and microfossils, and around 5000 brachiopods; a world-wide rock and mineral collection; a herbarium of around 16000 specimens, including the archive of the Definitive Flora of Gloucester published in 1948; birds and mammals; land, freshwater and marine molluscs; Palaearctic birds' eggs; and a large collection of invertebrate specimens including British beetles, butterflies, moths and a wide range of other insect groups. There are several special collections including the Lloyd-Baker, Clutterbuck, Greville Smith and Wild zoology collections; the Riddelsdell, Lucy and Haines herbaria; the Charles Upton brachiopods and recent molluscs; and the Walter Smith marine shell collection. In 2005 a survey of the collection undertaken by curators from Bristol Museum described it as being 'of great local and national importance' and 'one of six main natural history collections in the southwest'.

Why Have Partnerships?

It is not unusual for museums to work in partnership with other organisations outside of the museum sector, as is clearly illustrated by some of the talks at this conference, but on the whole it tends to be larger museums with more staff and more resources that do so. This was not always the case – go back twenty or thirty years, when even small museums had specialist curators, and generally they worked fairly closely with specialist groups and organisations in the area. At Gloucester City Museum the natural history department was very active, working with local wildlife and geology groups and participating in biological recording and academic research. Sadly with the departure of the last curator these links were lost, and although there has still been an interest in the collection from other members of staff, and the museum has had natural science exhibitions and events, things have dropped off considerably.

Working with partners brings benefits beyond economic ones - it can breathe life into an old collection. Partners can use the collection for academic research and any publications resulting from this will bring kudos to the museum; they can bring their specialist expertise adding value to the collection; and they can use the collection to teach others – practical resources like this are relatively rare.

Much of what we have in the natural history collection at Gloucester City Museum is not suitable for display and not relevant for primary school education sessions, for example we have systematic collections of many families of insects. The aim of the partnership project is to enable university undergraduate and post-graduates, as well as GCSE and 'A' level students, to be able to come in and use the collections for study and research.

First Steps

In June last year, Gloucester City Museum was approached by the Linnaean Society asking for a representative to go to London to discuss with them the future of systematics and taxonomy in the UK. Each year we are losing some of our older experienced taxonomists, but fewer students are taking up taxonomy as a career. The Linnaean Society was interested in exploring ways in which museums could contribute to helping revive an interest in taxonomy among younger people. Following this discussion, I approached heads of departments of the relevant disciplines of all universities within about an hour's journey from Gloucester, offering to show them around and suggesting that students could use the collections for research or study, or could help to catalogue parts of the collection, perhaps also students could give their expertise to help identify specimens. The response has been varied. Some did not seem to think they had anything to offer, some were keen to get involved, but were too busy, but the University of Gloucestershire responded very positively.

Positive Outcomes

Adam Hart, the head of biological sciences at Gloucestershire University and an entomologist, came down to look at the collection, along with Anne Goodenough, head of avian research and Rick Stafford, a biology lecturer. They were excited to see the collection and seemed genuine impressed with the range of specimens that we have. I was surprised to discover that the university has very little in the way of preserved specimens for students to work with.

Shortly afterwards, Adam, who has a weekly science slot on BBC Radio Gloucestershire, arranged for the presenter Anna King to come over and do an interview with both Adam and myself in the natural history store room to talk about the collection and natural history in museums. It was really good to get this kind of media focus on our natural history collection!

Just before Christmas 2009 Anne Goodenough came over with some students to carry out some biometric research on the bird collection, which has now been written up and submitted to a journal for publication. The experiment was planned carefully, using specimens that were not rare, were not part of a special collection, and were not considered to be fragile. The students were chosen by Anne as being ones who would take care when handling the specimens. On the success of this, more research projects are being planned for the future. One of these students, a postgraduate, is now working with the bird collection as a volunteer, checking the identification and entering the data onto the museum database.

Both lecturers were keen to bring groups of undergraduates to the museum to look at specimens – Adam told me that some students begin the course never having seen even some fairly common species in the wild, so this would be an ideal way to familiarise them with different species. We have also talked about involving local schools, so that ‘A’ level students can get the same kind of experience. The first students from the Gloucestershire University Avian Biology group came in January 2010. A range of bird species were set out to illustrate various points regarding taxonomy and anatomy (Fig. 2). Anne, the lecturer, was the only one to handle the specimens, except at one point when she asked if the students could hold one specimen to look more closely at a particular feature. Both Anne and Adam are very aware of how fragile specimens can be and also of the health and safety issues regarding old taxidermy specimens.



Fig. 2. Bird specimens used by the Avian Biology group (Image Copyright Gloucester City Museum & Art Gallery)

Albert Brydges Farn

Another interesting outcome from this partnership was the Albert Brydges Farn paper. While cataloguing the museum archive, I came across two volumes of 'A Manual of British Butterflies and Moths' by H.T. Stanton. The inside covers were stamped with the name 'A.B. Farn', and were heavily annotated in the margins and between paragraphs. Some of the comments were quite critical of the text and I was so intrigued by this man who obviously felt very passionately about his subject, that I decided to find out more.

Research revealed him to be Albert Bridges Farn, a naturalist born in 1841 in London and described as a 'tall man with magnificent shoulders' (Kershaw, 1956) (Fig. 3). Farn started his training to become a medical doctor, but appeared to have abandoned it when he received a large inheritance. He married and had a son and daughter, but his marriage broke up and by 1874 he was living in Dartford, Kent, with his son and common-law wife. He was a great collector of 'variants', and at one time was reputed to have the best collection in England. He was interested in the influence of the environment on colour forms, and on 18th November 1878 he wrote to Charles Darwin the following letter (Farn, 1878):

My dear Sir,

*The belief that I am about to relate something which may be of interest to you, just be my excuse for troubling you with a letter. Perhaps among the whole of the British Lepidoptera, no species varies more, according to the locality in which it is found, than does that Geometer, *Gnophos obscurata*. They are almost black on the New Forest peat; grey on limestone; almost white on the chalk near Lewes; and brown on clay, and on the red soil of Herefordshire.*

Do these variations point to the "survival of the fittest"? I think so.

It was, therefore, with some surprise that I took specimens as dark as any of those in the New Forest on a chalk slope; and I have pondered for a solution. Can this be it? It is a curious fact, in connexion with these dark specimens, that for the last quarter of a century the chalk slope, on which they occur, has been swept by volumes of black smoke from some lime-kilns situated at the bottom: the herbage, although growing luxuriantly, is blackened by it.

I am told, too, that the very light specimens are now much less common at Lewes than formerly, and that, for some few years, lime-kilns have been in use there.

These are the facts I desire to bring to your notice.

I am, Dear Sir, Yours very faithfully,

A. B. Farn



Fig. 3. Albert Brydges Farn: 'a tall man with magnificent shoulders' (Image Copyright The Entomologist's Record and Journal of Variation)

'On the Origin of Species' was published in 1859, and although this introduced the world to the concept of evolution, it crucially missed the evidence for contemporary evolution through natural selection. The case of industrial melanism of the peppered moth (*Biston betularia*) is often regarded as the clearest case of evolution in action. This was first observed in 1848 by Edleston, but it was not until 1896, 14 years after Darwin's death that Tutt explicitly linked melanism with natural selection. The correspondence from Farn indicates that Darwin was aware of this connection many years earlier, but appeared not to realise the significance of this information. Adam and Anne from Gloucestershire University did some background research and together we published a paper in Current Biology (Hart *et al*, 2010). This again resulted in more media attention; it was exciting for the museum to have its first natural history publication for more than a decade.

The Future?

It is early days yet, but some changes have been made to the layout of the natural sciences store so that there is a working area at one end and we are applying for funding for some basic equipment, such as microscopes, callipers and hand lenses. Building on the success of the project so far I plan to extend the project to other universities, and perhaps high schools, to run similar projects using the geology collection. I have been in contact with conservation groups and local wildlife groups, who have shown an interest in the collection, although there are no plans as yet to work together.

In the current economic climate museum collections are at risk of being lost in order to save money. It is vital that we use our reserve collections in order to safeguard them for the future.

Acknowledgements

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Darwin200 - beyond the bicentenary

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Abstract

The Horniman Museum used the bicentenary of Charles Darwin's birth to provide a focus for improving our communication with the public about biological sciences. The Darwin200 initiative provided support that facilitated our development of partnerships with the Grant Museum of Zoology, the Society of Biology (formerly the Institute of Biology), and £30K funding from the Wellcome Trust enabled us to offer an unusually diverse range of events, exhibitions and activities that relied on considerable collaborative working within the organisation and between partners.

The approach taken to the project was to integrate the majority of Darwin bicentenary activities into the normal Horniman Learning and Exhibitions offer (such as schools resources, music concerts, evening lectures and tours), but also to trial new developments (such as a medicinal garden and photographic competition) to help inform future decisions about programming and resources.

Valuable lessons were learned from this experience, ranging from the practical (such as how well do text-panels last outdoors) to the somewhat ethereal (such as identifying where weaknesses arise in chains of communication and responsibility when working in an inter- and intra-organisational collaborative framework). The outcomes have been very positive in developing partnerships and collaborations; improving the science offer to the Horniman's audience; raising the profile of project partners through the success of the photographic competition (which received excellent coverage from the national press), and raising awareness of Darwin's life and his contribution to science.

Introduction

The Horniman Museum and Gardens were given to the people of London in 1901 by Frederick John Horniman MP. They were dedicated to the public forever as 'a Free Museum for their Recreation, Instruction and Enjoyment'. The aim of the Horniman is 'to use its worldwide collections and the Gardens to encourage a wider appreciation of the World, its peoples and their cultures, and its environments'.

The Horniman houses collections of Natural History, Anthropology and Musical Instruments; we have an excellent Aquarium that is engaged in active research and our exhibitions building is set in 16.5 acres of Gardens which contain a conservatory, animal enclosure, nature trail, bandstand and a variety of themed planting areas. The Horniman also maintains an active temporary exhibitions programme, with one space suitable for large-scale temporary exhibitions and several smaller spaces suitable for wall-mounted art and photographic exhibitions. We at the Horniman serve an expanding and diverse audience, attracting 600,000 visits in 2008 of which 72% were families with children and 31% were from Black and minority ethnic groups. In the same year our Learning team ran sessions for 27,000 schools visitors.

The bicentenary of Charles Darwin's birth and the 150th anniversary of the publication of his theory of Natural Selection (Darwin, 1859) provided a strong national focus on natural history in 2009. Many museums and universities seized this opportunity to develop new (or tailor existing) public engagement activities and exhibitions to fit a Darwin theme. At the Horniman there was already an organisational initiative to improve the natural science offer to our audiences under the guise of the Evolution 2010 project, which focused on developing and linking the physical spaces of the Horniman's Aquarium, Natural History Gallery and Gardens. During 2009 it was expected that the Natural History Gallery space would be unable to be used due to redevelopments as part of Evolution 2010, so any Darwin related exhibitions, events and activities would need to occur in alternative spaces. Rather than seeing this as a disadvantage we seized upon the idea of offering resources, exhibitions, events and activities that would work with the alternative spaces available, whilst retaining a Darwin theme. This seemed to offer an excellent opportunity to engage with sections of our audience whose interests lay outside natural history and it provided scope for seeking collaborations with other departments within the Horniman as well as with external partners.

In order to ensure that our programme of events did not clash or unnecessarily overlap with those of other organisations, we attended the Darwin200 meetings coordinated by the Natural History Museum's (NHM) Innovation and Special Projects team. This provided a very useful point of contact, which not only informed us about what other organisations were doing and when they were planning to do it, but it served as a networking hub through which we were put in touch with individuals and organisations with whom we could work. Darwin200 also disseminated information about potential sources of funding, one of which was the Wellcome Trust's People Award, to which we successfully applied for a grant of £30k to supplement £41,875 of in-kind organisational support. This grant introduced some reassessment of our originally envisaged programme, providing scope to build-in some investigative work for planned future projects involving interpretation in the Horniman Gardens as part of Evolution 2010.

Darwin: Exploration and Investigation

Charles Darwin's career was founded on his childhood fascination with the plants and animals on his own doorstep; this fascination took him around the world and led to an understanding of life that shaped the modern world. It was Darwin's spirit of exploration and investigation that we aimed to celebrate at the Horniman, in the hope that it might inspire the same spirit in some of our visitors. We were also keen to ensure that the short term focus of the Darwin bicentenary yielded a longer term legacy for the development of the natural science offer at the Horniman.

In order to meet these aims we developed resources and programmed a range of exhibitions, events and activities intended to not only provide a broader context about Darwin as a person, but also how his ideas have shaped modern scientific understanding of the diversity of life and the adaptations seen in nature. In total, 25 different events were organised, some of which were repeated in up to 18 separate sessions. Key elements of the project worthy of discussion in the limited space available here are those providing a novel institutional approach, those involving significant collaborative working and/or those giving rise to legacy outcomes.

Photographic competition

The idea of organising a photographic competition originally arose from discussion with staff from the Grant Museum of Zoology (GMZ) at the 2008 Natural Science Collections Association (NatSCA) conference, whilst in a pub - the venue is noted in an effort to redress a widespread lack of wider organisational appreciation of how ideas are often formulated by *ad hoc* networking in an informal setting.

The premise was that photography has become widespread and cameras of some sort are accessible to most people. Good natural history photography requires an investigative and explorative approach to finding and framing a suitably interesting subject which could be applied in rural, urban or museum contexts equally well. Additionally, the outcomes of a photographic competition would hopefully be suitable for exhibition and institutional/public legacy usage.

The Institute of Biology (now Society of Biology and hereafter referred to as SoB) was planning to host their own photographic competition, and were put in contact with the Horniman and GMZ by the Darwin200 coordinators at the NHM. Rather than run two similar competitions it seemed sensible to pool resources and run a single competition in collaboration. This provided additional support for publicising the competition and finding prizes; opened up new audiences to all partners; provided valuable insights, suggestions and expertise.

The competition ran from 12th February to 11th October 2009 under the theme and title of "*Exploring and Investigating Nature*". Entries were invited from four categories: Junior young person (7-11); Senior young person (12-18); University/Higher Education student (no age limit), and Adults (19+). Photographs were accepted from any non-professional photographer based in the UK (although image location was not restricted to the UK), on the understanding that the images could be freely used by the partners involved in the competition. The remit of the competition was intentionally broad, to encourage diversity of entries and flexibility in the brief interpretation required from entrants. Images could be sent as hard copy to the Horniman (where they were scanned) or uploaded electronically onto a competition microsite, with restrictions on minimum image size of 1MB to ensure high enough resolution images to be suitable for exhibition and a restriction on maximum image size of 3MB to prevent overloading the microsite bandwidth and storage space (maximum resolution images were requested from the winners for the best possible reproduction). The competition rules can be found online¹. Judging was carried out by judges with a range of expertise

from biological research to professional photography.

The SoB offered £500 in prize money, promoted the competition on their website and via their journal *Biologist* and they provided Prof. Dianne Newell OBE as a judge. The GMZ hosted the main competition microsite and image uploading facility via their parent organisation University College London (UCL), they assisted with promotion, ran photography events and provided Prof. Steve Jones and Randall Keynes OBE as judges. The Horniman coordinated, administered and promoted the competition, ran photography events, organised the prize-giving, produced an exhibition of the winning entrants and provided Kate Humble, Emma Carter and Heini Schneebeli as judges. The Wellcome Trust grant supported the promotion of the competition and a prize-giving reception and provided Dr. Daniel Glaser as a judge.

The competition yielded 217 entries, the vast majority of which were excellent. An administrative pre-selection process removed images taken by professionals (of which there were several) or those images that contravened the competition rules (those lacking any interpretation for example). A second pre-selection by the Darwin200 project manager and the Head of Exhibitions at the Horniman removed images that were out of focus, poorly composed or that lacked the visual impact required for use in an exhibition. The resulting long-list of 83 entries was then made available online and on CD for the judges to assess. The final decisions were made at a meeting, which most of the judges attended, taking into account the written preferences of those who were unable to attend. A shortlist was produced by discussing the relative merits of images and discarding those with least support. Each judge then applied a numerical ranking to the shortlist which allowed the winners to be quickly and fairly identified on the basis of an overall score.

The winning photographs were turned into an exhibition, the launch of which was also a prize-giving event to which the winners and highly commended entrants were invited to receive certificates, framed prints of their image and £75 vouchers for the category winners and a cash prize of £200 for the overall winner. The winning and highly commended entries were featured as slideshows on the BBC news website² and the Guardian online³ and in a booklet of the exhibition that was produced for winners, judges, project partners and other natural history organisations and which is available online⁴. The overall winner also had their image used on the cover of the Horniman's *What's on Guide* for winter 2009 and SoB *Biologist* journal, whilst all of the winners were featured in an article about the competition in the same issue (Newell, 2010).

This was the first photographic competition run by the Horniman and although it was successful in terms of outcomes, the running of the project was more challenging than had been foreseen – with many of the challenges due to the novelty of the project, which meant that effective methods of working had not yet been established. From the audience perspective there were issues raised by the image upload interface⁵, which seemed over-zealous in rejecting entries that failed to conform to quite exacting file and image sizes and formats. In retrospect it would have been preferable to allow a wider range of file formats, sizes and image resolutions to be uploaded; only preventing excessively large images to avoid systems issues. Smaller files could have been sorted after upload and unsuitably small images could have been discarded during the preparation of the long-list. From an organisational perspective, problems were caused by delays in communication between the partners overseeing the image and entrant detail uploading interface and the partners managing the administration of the entrant's details and entries for subsequent use. In hindsight these two elements could have worked through a single central database or should have been managed by one partner.

Medicinal Garden

The Medicinal Garden was intended to link the Horniman Gardens into the Darwin200 project and thereby provide an opportunity to trial outdoor signage which could inform future plans for outdoor interpretation. The Medicinal Garden was also partly an attempt to provide a medical link to strengthen the funding application to the Wellcome Trust, and to provide scope for interpretation focussing on plant adaptations and the exploitation of plant chemical defences by humans, relating this back to Darwin's long-term ill health.

Previous plantings in the Gardens had been themed, but had not relied on interpretation panels, which meant that the development of such interpretation had not been previously undertaken. The research to identify and interpret plants was carried out by a member of the Gardens team in consultation with the Chelsea Physic Garden, our Gardens Access Learning Officer, curators in the Anthropology and Natural History departments, with input from Senior Management and a member of our Trustees with expertise in the field of botany. The main interpretation was printed onto 'Vault' indestructible graphic display panels by Leach Colour⁶ and the individual plant labels were printed on card and laminated in-house.

Interpretation was also developed by a costumed interpreter who delivered sessions as Henry Bence Jones, one of Darwin's many physicians. This allowed the historical importance of medicinal botany collections to be explored, whilst providing an insight into the health problems that Darwin endured for much of his life. The interactivity of these sessions provided an excellent contrast from the drier and more factual interpretation provided using labels. Garden Explorer Backpacks facilitated another level of self-led interpretation and interaction for families (see below) and an evening event headed by Michael Holland of the Chelsea Physic Garden and Emily Dutton of the Horniman provided an adult focus. These different approaches to interpretation in the Medicinal Garden created a genuinely layered learning experience.

The Medicinal Garden attracted local media attention when it was opened by Joe Swift of Gardener's World and it proved popular with visitors throughout the summer of 2009, with reduced but continued interest shown through the winter period. Monitoring visitor numbers in this outdoor space proved difficult, but quantitative and qualitative feedback from related events, plus unsolicited feedback on comments forms (e.g. *"To the Gardeners. You have done a wonderful job on the Medicinal Garden thank you for all you have done for the public"* and *"Medicinal plants display in gardens is excellent with clear (apart from 1) labels showing plant names, and also explaining the medicinal uses of plants..."*), strongly suggest that the Medicinal Garden successfully engaged the Horniman's audience.

Evaluation of the Medicinal Garden informed subsequent interpretation activities in the Horniman Gardens. The Darwin's Physician tours continued in 2010 and development of the 2010 Gardens exhibition 'Allotment Life' was informed by learning from the Darwin200 experience. A practical example being that laminated card was found to require regular replacement due to water damage and rapid fading, whereas the 'Vault' indestructible graphic display panels were found to be robust and hard wearing, although prone to some fading when located in a south-facing position. The light, low contrast colours originally chosen by designers were found to be less appropriate for outdoor display than darker higher contrast colours, since a small degree of fading significantly reduced legibility of the panels. The 'Vault' signage was subsequently used in the Allotment Life project with darker print to improve longevity and rounded corners for greater safety. Methods of developing interpretation were also informed by consideration of the process used for the Medicinal Garden, with an improved procedure for signing off final copy.

Nature Explorer Backpacks

We were keen to develop a legacy resource for our family audiences that would facilitate exploration in the Gardens, Aquarium and exhibitions spaces. It was decided that a self-led activity was needed, since the Horniman Learning team were fully committed to other event delivery and were unable to schedule the time and space required for additional activities. Play-led learning resources and equipment to facilitate exploration and investigation were identified as the resources likely to be used by children supervised by parents or guardians, so a variety of themed packs were developed along these lines.

Twenty-five backpacks were produced with the Horniman and Wellcome logos – Darwin200 was excluded from the branding on the backpacks to prevent the packs from appearing dated when used after the bicentenary year. Three different themed interchangeable contents were developed for the packs initially and evaluation of their use informed the redevelopment of one theme and the development of a further two themes. The themes chosen were: Medicines from nature (for 5-7 year olds), Medical mystery tour (for 7-11 year olds), Minibeast explorer (5 -7 year olds), Plant explorer (all ages), Bird explorer (all ages). Administration, distribution and explanation of the packs were undertaken by participants in the Museum's 'Engage' volunteer programme, leaving Learning staff free to develop and deliver their core engagement programmes.

Feedback from evaluation of the packs by 58 adults, 27 children under five and 53 children over five indicated that they were enjoyed by the families who used them and they successfully fulfilled their role of facilitating self-led engagement with the Gardens, Aquarium and Galleries (e.g. *"Helped the kids to take in what they were looking at instead of just wandering around"* and *"This was a fantastic activity for the kids – thank you"*). The need for some changes were also identified from the public evaluation and feedback from the volunteers and staff administering the packs, including better signage informing the public about the availability of the packs; numbering packs to facilitate the tracking of inventory; stronger linking to the collections, and making the themed resources age independent. These changes were rolled out for 2010 and the backpacks are to be maintained as an ongoing resource.

Café Scientifique

Café Scientifique events have been running for nearly twenty years and now take place in over forty countries. They usually take the form of an evening meeting in a café or bar where scientists are invited to talk in laymen's terms about their work. The events are known for their informal and friendly atmosphere and the intent is to empower non-scientists to more comfortably and accurately assess science and technology issues, particularly those that impact on their own lives and interests. As such, Café Scientifique provides an established and recognisable framework for running science engagement activities in an informal setting⁷. The Darwin200 project provided an opportunity to test the format of Café Scientifique as an evening event run in collaboration with a local school. The format chosen was a 'Biodiversity Balloon Debate' where four UK species each had a champion in the form of a professional biologist, who argued the case for their continued survival. The arguments put forward were discussed and the audience voted to keep the species for which the most compelling argument had been put forward.

The event was well attended (41 people) and the feedback about the event was very positive, both from the speakers and the audience e.g. *"Very interesting. Should be done again. I learnt a lot"* and *"I thought the debate was brilliant and can't wait for the next one"*. Problems did occur with the AV set-up during the event, which was noted in the feedback e.g. *"Please test the gizmos before the show. They never work first time"* and *"Difficult to hear. Sound system erratic. Powerpoint needs sorting!"*. Other feedback suggested changes in the timing of the event: *"Really enjoyed Café Scientifique session on Biodiversity. Good format. I'll go to a few Café Scientifique events. Great venue. Was a wee bit too early to make it across the city, otherwise great"*.

The success of the Café Scientifique format led to its adoption for an International Year of Biodiversity event hosted by the Horniman in partnership with the Royal Society in February 2010, with contributors from GMZ, UCL, NHM and Norwich Castle Museum (for a summary see author's blog⁸). An advantage of the format is that it is sufficiently informal to attract a broad audience and it offers an opportunity to collaborate with other organisations. The Horniman plans to adopt Café Scientifique as a regular event in its Thursday Lates programme.

Music concerts

From the outset of the Darwin200 project there was the intention of working Darwin related themes into the established core programme of events of the Horniman. This was intended to ensure that the new methods of work being undertaken would be supported by well tested methods of engaging our audiences. The Horniman has hosted a series of summer concerts every year for over a decade, and it was decided that for 2009 at least one concert in the series should have a Darwin theme.

In the end all four concerts contained elements relating to Darwin, Natural Selection or nature – as decided upon by the performing artists in liaison with curators in the Musical Instrument department. The pianist Oliver Davies cast a fascinating light on Darwin's taste, personality and home life; John Kenny explored the evolution of musical instruments with a focus on the trombone; Guitarist Rafael explored the connections between flamenco and nature, and Stephen Preston led the final concert with a performance on the baroque flute based upon the sounds of birdsong.

The concerts were attended by at least 250 people and the feedback received was very positive for all performances (e.g. Oliver Davies received comments along the lines of *"Brilliant programme, wonderfully researched & written up. High calibre of performance all round. Bravo!"*; comments for John Kenny's piece included *"The best lecture I've ever seen"* and *"Loved it! John was magic and would have wanted it to have gone on longer. O am partially deaf and the acoustics for John's soft spoken voice made it a little difficult to hear at times. Still enjoyed this very much!"*; Rafael received comments such as *"I was absolutely entranced by today's performance. We are very fortunate to have such culture provided for us"*, and Stephen Preston's feedback included *"I learnt how nature can inspire some gifted people to create amazing things to be enjoyed by many of us. Thank you birds!"*.

Outcomes

During the project period the Horniman had record attendance, with around 753,000 visits to the Museum and Gardens. Since many of our visits are repeat, this means that the Horniman's Darwin200 project reached approximately 375,000 individuals, not counting those who enjoyed the outcomes of the photographic competition hosted online. The programme provided the opportunity to: work in close collaboration

internally and with a wide variety of external organisations; engage new audiences and develop our offer to existing audiences, and trial new methods of working and develop the resources and skills required to support and continue that work. Feedback was very positive and where negative it is being used to improve methods of working. The overall aims of the Horniman's Darwin200 project were achieved and the outcome has helped determine future working.

Large scale national and global initiatives like Darwin200 (and 2010 International Year of Biodiversity) can play a valuable role in providing an organisational focus on science engagement, which can be used as an opportunity to raise the profile of natural science collections. An issue that many museums have with such initiatives is a lack of legacy outcomes, but with imagination, planning and exploitation of the opportunities that arise alongside such initiatives, it is possible to trial new and collaborative methods of work and resource development that could leave a lasting legacy.

Acknowledgements

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Google Me a Penguin: Natural History Collections and the Web

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A lot of useful work has been undertaken in recent years with natural history collections and the web. Many online databases have been launched and there is a huge network of subject specialist web forums offering professional curatorial advice from topics as diverse as setting entomological specimens through to sourcing fossils for museum galleries. Nonetheless, although online databases may have been created through funding with the idea of making collections accessible to ‘everyone’; online museums do not, in fact, *engage* with the ‘web public’ at all. Museum websites do not support the kind of curiosity-based learning and wonder that natural history galleries inspire, or provide access to infectiously enthusiastic and knowledgeable natural history curators, conservators, educators, volunteers and managers.

Introduction

It appears to take between five and ten years for technology, be it social networking sites like Facebook (2004), Twitter (2006) or web practices like metadata tagging through Delicious (2003) or news aggregating on Reddit (2008) or Digg (2004), to filter down from the early adopters and technophiles to museums. In that ten-year gap, young people will typically adopt and then drop the technology, marketers will find a way to exploit the technology and even libraries will have used the technology before museums eventually start to experiment (around the same time a number of extortionate ‘How to...’ training courses start to appear in the museum specialist press). Often this lag between launch and museum use is beneficial because the technology will have been critically tried and tested and is therefore more likely to persist for a number of years. Occasionally this means museums are jumping into new technologies late and often struggle to stand out. Furthermore, museum spaces and their wonderful objects don not naturally translate to the web and museums don’t appear to have a comfortable niche. Compare natural history museums websites to the websites of charitable conservation organisations, natural history ‘glossy mags’ and natural history documentary makers. These other organisations have used the web to complement their ‘meatspace’ entities; as will be seen, natural history museums struggle to stand out or offer a consistent service. Of higher concern is that even a potential virtual visitor who knows that the museum exists may not even make it to the museum website. Generally, museums are very good at assessing and addressing issues with physical, intellectual or psychological access to museums and museum displays, but as will be shown there has been little thought put into the web accessibility.

Methodology

In order to demonstrate how accessible natural history museums are to a virtual visitor, a simple experiment was designed to model a web-based search undertaken by a hypothetical virtual visitor interested in finding out more about penguins. The virtual visitor has a homework assignment and would like to find out more reliable information about penguins (see **Notes** for discussion about reliable information on the web). This virtual visitor is the ideal individual that a museum may hope to inspire or at least assist in the search for information.

Penguins were chosen as the topic under research because penguins are almost universally recognisable, in contrast to examples like Northern Hairy-nosed Wombats or The Tissue. The word penguin is also less likely to return confusing results from search term matches. Penguins were also selected because they are not ‘super-Hollywood’ animals like lions, tigers or pandas which we might expect to be very well covered by museum websites. Lastly, penguins were desirable because almost every zoological natural history collection will have penguin specimens.

In order to assess the breadth and quality of information, our theoretical web visitor has the following six questions to answer about penguins. How many kinds of penguin are there? What do penguins eat? What kind of animal is a penguin? Where can you find penguins? Do penguins fly? What is the biggest and smallest kind of penguin?

Museums were given a slight favourable bias in the web search. For each museum the starting point for the information hunt would be to type the word penguin into the first obvious search box found on the museum homepage. In reality, it is unlikely that a visitor would run this query through a museum website; more likely a search engine would be used. In order to model typical web-browsing behaviors, a number of constraints were put in place during the hunt for the relevant information. If no results for searching the word *penguin* then the search was recorded as a fail. If there were results listed then the visitor was given a rather generous bounce time (the amount of time somebody browses for relevant information before giving up and going elsewhere), of 40 seconds and a maximum of 20 clicks were allowed subsequently to find as many of the answers as possible. Again, the odds are slightly stacked in the favour of the museum, considering that the bounce time is an order of magnitude more than it is estimated the average website visitor will tolerate (*Every Second Counts: How Website Performance Impacts Shopper Behaviour*).

The Sample Set

The sample set of museums was quite simply all the natural history collections that were in attendance at the 2009 NatSCA meeting, a list of 24 museums and collections. This sample set was chosen as aptly, the analysis would be presented at the 2010 NatSCA meeting.

Results

	How many species	What do they eat?	What kind of animal?	Where do you find penguins?	Do penguins fly?	Biggest Smallest	Notes
Birmingham Science museum	0	0	0	0	0	0	No results
Cliffe Castle	0	0	0	0	0	0	No results
Dundee University Museums							Timed out
Grant Museum of Zoology							Timed out
Glasgow Museums	0	0	0	0	0	0	No results
Hampshire County Museums Service	0	0	0	0	0	0	No results
Horniman Museums & Gardens	0	0	1	0	1	0	Gallery trail
Hunterian Museum Glasgow	0	0	0	0	0	0	No results
Hunterian Museum London	0	0	0	0	0	0	No results
Kelvingrove Art Gallery and Museum	0	0	0	0	0	0	No results
Museums in Leicestershire							Timed out
Leeds City Museum	0	0	0	0	0	0	No results
University of Manchester	0	0	1	0	0	0	Gallery guide
National Museum Wales	0	0	0	0	0	0	No results
Norfolk Museums & Archaeology Service	0	0	0	0	0	0	No results
National Museum of Ireland	0	0	0	0	0	0	No results
Natural History Museum London						1	Clicked out
Oxford University Museum	0	0	0	0	0	0	No results
Plymouth City museum	0	0	0	0	0	0	No results
Cole Museum							Timed out
Royal Albert Memorial Museum	0	0	0	0	0	0	No results
Warwickshire Museum Service							Timed out
World Museum Liverpool							Timed out
York Castle Museum	0	0	0	0	0	0	No results

Fig. 1. Table summarising the results of searching the word *penguin* on museum websites and the results that matched the six pre-selected questions.

As can be seen from Fig. 1, there was a relatively low success rate. Of the museums sampled, fifteen museums returned no results for the search term *penguin*. Six museums returned some results for the word *penguin* but none of the sample questions could be answered. Answers to the questions could only be found on three museum websites. An online gallery guide from the Horniman Museum detailed penguins as flightless birds. The Manchester Museum specified that penguins were birds as part of a gallery guide and The Natural History Museum listed somewhere on the site information about the biggest and smallest penguin, however, the rest of the search timed out after 20 clicks. Not only was the return rate relatively poor but the results that did come back ranged from classic penguin-based jokes through to results related to *Lady Chatterley's Lover* (presumably the Penguin edition).

Regardless, these results from the rudimentary analysis might be entirely moot because in addition to the above test, when the word *penguin* was searched on Google, museums did not even feature at least as far as the thirteenth page result before the author gave up. Incidentally, the Wikipedia page for penguins was the third returned result which also had 100% of the answers to the sample questions on one page.

Conclusion

As was demonstrated by this quick test, natural history museums are failing the web public. Although slightly better results may have been anticipated, the overall result should not come as a surprise. Museums have nowhere near the resources to compete with sites like Wikipedia and even if they did, every museum producing exhaustive resources on every taxon would be unfeasible and the duplication of work would be wasteful in a sector which already struggles for adequate resources. Rather than compete with Wikipedia, a website which receives billions of hits per year, natural history museums should look to exploit Wikipedia so that any relevant information about their collection will be brought to the attention of the people searching for it.

So for example, if your museum holds the biggest, smallest, oldest, fattest, localist, fakist or ugliest penguin then make sure that is on the Wikipedia page for penguins. If Darwin owned a penguin in your museum collections, then make sure that information is on the page for Charles Darwin and penguins. This could be achieved by employing a Wikipedian, recruiting a Wikipedian volunteer or train staff to add relevant information when it comes up. This will at least ensure that individuals looking for this information are significantly more likely to find it. Putting empirical information online is only one way of reaching the web public - but reaching is very distinct from engaging the web public which requires a completely different tactic.

Blogging the Museum

Aside from just making sure that information is available, curators should, if it is appropriate, be engaging the web public not through the presentation of ideas and facts but through, it will be argued here, an exposition of what it is like to work in a natural history collection. This is most easily achieved through the kinds of content that can be posted on weblogs (blogs). Here are the author's top ten tips for engaging the web public:

I. Audiences

It is important to think of the web audience as its own discrete audience and engaging with the web audience should be thoroughly thought through with the same level of planning as engaging with a new real world audience. Who specifically are you targeting? Is there an opportunity to share an audience? Is this audience already catered for in the competitive online space? How will you measure effectiveness? Putting content online does not automatically equate to being available to everyone. In some museums it may not be appropriate to engage web audiences either because resources do not allow it, existing audiences are sufficient or the web audience is not connected to the museum's mission. In which case a basic website with contact information is sufficient. Not every museum by default should be engaging with their web audience for reasons given below.

II. Frequency of updates

Frequently updated websites (generation of new content) are better than websites which do not feature a weblog at all, which in turn is better than a website where the blog is infrequently updated. Blogs which are not updated regularly will not keep your web audience engaged or keep them coming back. If a blog looks 'dead' then the audience is less likely to engage through leaving comments, recommending your site or tagging various entries for others to read. Some of the most popular blogs are updated hundreds of times every day by a team of full time staff. This keeps the content fresh and gives the audience something new to access. Also it allows a broader range of subjects and topics to be covered, meaning that the potential readership for your museum blog is greater.

III. Cross-media

The wonderful thing about weblogs is that they allow images, videos and audio to be uploaded. Both natural

history specimens and working with natural history specimens is a bit of an odd job, and inherently interesting so use every opportunity to 'show not tell'. Even with the best will in the world your content may well be competing with hundreds of other posts and articles through a feed reader or a site aggregator, so grabbing the attention of readers is as important as what you have to say. Fortunately, the nature of museum objects naturally lend themselves to photography and film.

IV. Sustaining an audience

Museums engaging with the web audience should be prepared to sustain the attempt to build up an audience over a long period of time. Building up a healthy audience (see 'check the statistics' below) can take years rather than months. Do not set up a weblog for a year-long contract funded project for example because more often than not the blog will not have built up an audience before all the staff associated with that project move on and the blog is closed, or worse, is just left un-updated. For institutions where natural history collections make up a larger network of museums, it is a good idea to set up a collaborative weblog which means that temporary projects can feed into a central blog which is sustained after individual projects are over. In addition, keeping the blog updated is easier, although catering to a mixed interest audience needs to be taken into account.

V. Check the statistics

Ideally, before embarking on blogging the museum, care should be taken to define how effectiveness, success, or failure, will be measured. There are a number of software applications like Google analytics, which automatically collate web statistics from counting how many visitors you received, how they got to your site, how long they stayed, how many pages they looked at and even where your visitors are geographically located. In annual reports, will hits to the website be counted on a par with physical museum visits? Is 400 hits a day with an average bounce rate of 3 seconds better or worse than 20 hits a day with an average bounce rate of an hour? Both represent the same amount of virtual dwell time. Another advantage of collecting the statistics is that it is very easy to see which topics or posts attracted the most attention or drew in the most new visitors, one type of automated visitor evaluation. This information is useful for planning future posts as well as optimising weblogging practice.

VI. Find a voice

Traditional interpretation in natural history collections is often based on empirical observations and is apersonalised, however, this voice may not work as well if blog entries are to be entertaining, passionate or even humorous. The institutional voice should be considered. Will staff blog as: themselves e.g. Mark Carnall, represent one aspect of the collection e.g. The Curator, The Conservator, The Janitor or will they blog as a historical character e.g. Charles Darwin. Establishing a voice will make it easier to keep entries consistent, decide what will and won not be bloggable and will also dictate how to deal with issues arising over blogging contentious subjects (a disclaimer of some sort is normal practice).

VII. Be Emotional

Related to the point above, this is only the author's personal preference but blog entries are much more interesting to read if the author is not constrained by writing impassionately or without bias which gives much more freedom for humour and enthusiasm. Furthermore, one of the brilliant aspects of the museum sector is that most individuals are highly enthusiastic about their subject, their areas of interest and their museum. Preventing this enthusiasm to be communicated seems counter intuitive. Without the human element, museum websites can devolve into computerized event listings, which is functional but will not necessarily keep readers coming back.

VIII. Internal Advocacy

Household products, events, historical characters and the trivial thoughts of the average tweeter. These are all things that have their own URLs, cynically indicating that the URL is its own form of communicative media. For large institutions, blogging your activity can be hugely useful for promoting internal advocacy. A successful event or event series will end up as a small part of a series of numbers, maybe with one or two qualitative comments on an end of year report; by linking to a post-event blog post with images or video a better sense of the event can be obtained. CPD and skill-sharing is also more easily shared if blog posts on various topics can simply be forwarded.

IX. Our Hidden Histories

Blog posts can act as a historical record of an event, a process in which the thoughts of museum staff otherwise would not be preserved. Comments from blog readers can also preserve a sense of cultural interaction

which is also often forgotten. Archived annual reports tend to preserve big institutional histories and database entries and logbooks preserve an element of the day-to-day activity of a museum. Ironically, museum curators are typically very bad at recording their own individual histories or the ethnographic history of their profession. Even less of this history is preserved now that electronic mail has all but replaced snail mail correspondence. Blog posts can give an insight into the character of individuals and preserve actions, thoughts and ideas which are too whimsical, brief or specific. Historians of the future would be able to make far more accurate and well-rounded reconstructions of the past if this transient activity is sometimes recorded.

X. Work together

Forming partnerships, communicating with colleagues and sharing skills is potentially made all the easier through blogging if museum workers get into the habit of reading each other's thoughts, sharing relevant links and resources and even debating with each other. This activity does tend to happen on professional web forums and other networks but the discussion tends to be 'behind closed doors'. If these interactions were held in a more public forum then there is a much greater scope for engaging the web public in how museums are work and how they are run. This provides a much greater transparency which is absolutely fundamental for ethically run public museums and could also lead to greater investment and engagement from key stakeholders.

Notes

The reliability of information on the web is a contentious subject. Wikipedia, for example, has been criticised on a number of occasions over the years on issues of accuracy. Anybody, upon registering an account can add information to the millions of pages that make up the electronic encyclopedia. Supporters of Wikipedia claim that the thousands of editors and transparent discussion pages lead to up-to-date, referenced and transparently created information pages. Dissenters argue that the process is too democratic, open to abuse and unreliable. As a counterpoint to the latter stance, readers who are concerned about the accuracy, reliability and transparency of information should compare the Wikipedia page for Human (<http://en.wikipedia.org/wiki/Human>) to how our species is listed on Mammal Species of the World (<http://www.bucknell.edu/msw3/>), the Tree of Life Web Project (<http://tolweb.org/Homo/16418>), the University of Michigan's Animal Diversity Web (<http://animaldiversity.ummz.umich.edu/site/index.html>), Michael Benton's VERTAPPENDIX (<http://palaeo.gly.bris.ac.uk/benton/vertclass.html>), Systema Naturae 2000 Taxonomicon (<http://taxonomicon.taxonomy.nl/>), the Integrated Taxonomic Information System (<http://www.itis.gov/>) and the Palaeobiology Database (<http://www.paleodb.org/cgi-bin/bridge.pl>). A number of these online databases, created by universities or groups of specialist professionals, are frozen in time, undated, unreferenced, hugely inconsistent with each other or a mix of two classification systems. For example, the Taxonomicon lists over 30 taxonomic ranks in the *Homo* tree, The Palaeobiology Database lists 4. The Encyclopedia of Life, seemingly pre-empting this analysis, just displays the Wikipedia page for Human (<http://www.eol.org/pages/4454124>).

Well, it worked for me ...
A personal view of the new Natural History Gallery
at Norwich Castle Museum.

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Introduction

Museum galleries are dreadful places in which to learn. There are too many distractions, they are often full of noisy kids, and most of the time you have to stand. However they are great places to be inspired, to become intrigued, to be moved, to be fired with a desire to find out. Sometimes inspiration comes from contemplating an isolated iconic exhibit. But, as natural historians, our greatest asset is biodiversity. Even for us it is sometimes difficult to comprehend the amount of diversity this planet has produced – so celebrate it, in any way that you can, and display it so that your visitors can experience the same sense of wonder that drew most of us into this field.

So when it came to deciding how to redisplay our natural history gallery, to engage the public in a more effective way, I thought – “What worked for me?” All we had to do was remember what had inspired us in museums, and all would be well. If we could produce something that inspired us now – then maybe we would be OK. We did consult with others – notably a group of art students, a class of primary school children, and our museum access group. We also relied on our admin colleagues to express an opinion about work in progress. An “mmmm...” meant a rethink, while a “Wow!” indicated we were on the right track.

Redisplaying Norwich

Our displays in Norwich Museum cover a small area, and we couldn't begin to include all the information about our specimens, but that information is available to anyone with access to the internet or a public library. All they need is a key – the name of that weird bird or fish or insect they saw at the museum. Not everyone is turned on by the natural world, but most our specimens all have their own stories to tell – so we have presented a social history as well. Our aim is to engage with the public in many different ways and different levels. There is spectacle, there are secrets, there is information, there are serious messages, there are jokes. Most of all there are specimens and objects. There's not much to read, but there is more on-line.

I'd been thinking about redisplaying this gallery for about 25 years. I knew that I didn't want to waste money on new cases. The current ones were 110 years old, and had been viewed by millions of happy visitors. The glass was still see-through, and according to what I'd heard at last year's conference, we'd only be able to afford half a new case before the budget ran out, so new cases weren't an option. We wanted to keep the gallery open for as long as possible, so we hit upon the idea of constructing a mock-up case, the same dimensions as the existing cases, within which we could design the displays using actual objects. Thus we would know that everything fitted, and what size the labels could be, and what height to put them at so that everything was visible. Within the team we had representatives of most of the common height classes, so the position of the exhibits could be adjusted to suit everyone. Measurements and photos could be taken and mounts could be designed so that installation should be a rapid, trouble-free experience. Which it was with a few exceptions.

I have to say here that I have an allergy to external contractors, particularly design consultants. Some of the symptoms are raised blood pressure, increased heart rate, hair loss and something akin to Tourette's Syndrome. Despite my protestations we still ended up contracting out some work, and sure enough, we received some items that were not what we thought we had specified. Apparently this often happens during new gallery work, so now I'm beginning to understand where all the money goes.

I'd never written a display brief before this project. I still haven't. At least the brief I produced was so brief, it doesn't count. Here it is :

We have some stories to tell. For each story we will select a few big objects that might help. We'll put them in a mock-up case, see how they look and get some more objects to go with them. We'll play around with them until they begin to look interesting then think how to show them off nicely. We'll take some measurements and a photo to help us remember what we've done. Then we'll write a big label for the case, and move on to the next one. If anyone's not happy with what's happening then say so. Crazy ideas are not necessarily crazy. If we think it's funny, at least some of the public will think it's funny too. If we're having a good time, then our visitors should have a good time too ...

Fitting the cases

In this project an object list is something that is created as the displays are designed. It is finalised when the gallery opens – well, actually 3 months after the gallery opens, just when the final labels are being written. After the opening I received one e-mail of complaint and I quote *“Saddened to be unable to find the sloth in your new display. The sloth in your old display had been for many years both a role model for me and a terrible warning for my children.”* Fortunately as the final labels hadn't been written, we were able to rearrange things within the Taxidermist case and include the sloth (Fig. 1).



Fig. 1. The redeveloped taxidermy display case full of animals, including some old favourites! (The sloth is in the case, but to the right, just out of shot.)

During the course of the redisplay work we were fortunate to be able to take on contract staff. We were also blessed with several outstanding volunteers and interns, in both design and natural history conservation. Joanne Osborne was able to let her design skills flow when creating graphics for the interactive area. And some of you will have met our French conservation student Marie de Beaulieu at last year's conference. She did outstanding work on restoration of the giant tortoise and many of the birds.

Occasionally restoration work was contextualised. On the deck of our reconstructed sailing ship, we have a crew formed from the natural history specimens that were collected on the Rattlesnake Expedition, or by Captain Glasspoole of the East India Company, or from various other voyages of exploration. Among them is a parrot that only had one glass eye, as it was originally intended to be viewed from its left side. We wanted to show it from both sides, so our contract conservator Trish might have given it another eye, but she opted for an eyepatch instead. Our Thorny Devil lizard had met with a schools loan accident and lost a front leg. We could have recreated a perfect prosthetic, but somehow it seemed more appropriate to carve a little peg-leg (Fig. 2).



Fig. 2. The Thorny Devil specimen with its hand carved wooden leg.

Next door in the mollusc case, a more aesthetic, formal arrangement of shells celebrates the beauty of form and colour, while astonishing the visitor with biodiversity within a single class. But even here, there's room for a subtle bit of humour, as the Roman Snail has left its appointed place and gone for a glide. Even if only one child is not quite sure whether it's moved by itself, then it's been worthwhile.

Most of the time the curators (Dave Waterhouse and myself) kept a fairly tight rein on the designers, who had only just completed a decorative art gallery, but we let them have their artistic way with the molluscs and also the birds' eggs. As I said, crazy ideas were not dismissed and so we ended up stringing the smaller eggs on nylon. A labelling nightmare, but everyone seems to love the Magritte-like effect.

In contrast, we adopted a more naturalistic approach in the Taxidermy Workshop Case. Yes, the children want to know if its real blood. We tell them its woodstain. And a drawer of glass eyes never fails to please.

Next door, the Curator's Office presents a tidier, less paper-filled version of reality, but there are plenty of only-just-visible objects to intrigue. Some things only children can see. Some things only grown-ups can. There's something satisfyingly surreal about a hedgehog living in a swordfish head.

Shallower cases at the end of the gallery have been used to display smaller objects – one for insects, one for Margaret Fountaine's butterflies, one for plants and one for microscopes. Having done it before with the butterflies, we have adopted a cyclic approach to the insects and plants on display. Each drawer or sheet is only out for a few weeks at most. It is then put away and another takes its place. In this way, the public get a chance to see research collections in the gallery, and the displays are regularly changing. The plants are much admired, and at last our unprovenanced New Zealand fern collection has found a role in the museum.

In the old gallery there were several "favourites" which had to be retained. The polar bear is the most iconic, but it had always troubled me that its icy polyfilla background resembled the top of a Christmas cake. We took the opportunity to replace the polyfilla with something a bit more realistic. Within this case we included some ethnography – it seemed fitting to illustrate the story of polar exploration with natural and man-made objects.

The polar bear case is used to introduce a message about climate change, and throughout the displays, conservation messages are appended to the labels to get visitors thinking about some of the contemporary issues which affect them and the species represented in the cases.

The fish case has a blatant biodiversity theme, but also a message about sourcing sustainable food (Fig. 3). The case of horns relates the early conservation work of Edward North Buxton, who shot many of the specimens, but is also a celebration of variety and form. The plain background colour for this case was chosen to match one of my favourite polo-shirts which we all agreed was the right shade to show off the heads. And within the case there are visual jokes which are spotted by some and might raise a smile.



Fig. 3. The busy fish case, almost mimicking an aquarium. Lots of specimens for children and adults to look at and explore.

The background graphic panels were chosen and designed after the case had been mocked up, and as a result there is a refreshing variety of styles from old reference book plates to wallpaper to photos. The safari photo that was used for the background to the African display was one that was taken by one of my mother's boyfriends in the 1930's. The selection of mammals and birds that we had available to illustrate collecting in the Empire in Africa happened to include most of the characters from the Lion King. It's not mentioned in the labels, but if young visitors want to make the connection, that's fine.



Fig. 4. The mock up for the travelling zoo case.

In contrast, the background for the Travelling Zoo case makes use of posters for Bostock and Wombwell's Menagerie – all of the animals in this case had once been part on tour, and the kangaroo was a boxing celebrity in its day (Fig.5). Previously these mammals had been dispersed through the gallery, each with its zoogeographic colleagues and a label declaring where this species lived and what it ate, with no mention of the extraordinary personal history of these specimens.

Among the 75 birds in one case there is a tinsplate imposter tucked away, unseen by the fleeting visitor, but noticed by keen-eyed children and an indignant puffbird. Most of the birds are apparently on the move heading in homage to the Great Auk. The star of this display is in the dark, in a glass-doored fireproof safe. The last time it was on long-term display was many years ago on a table under a fragile glass dome. The button which switches on the light in its home is one of the few high-tech interactives in the gallery.

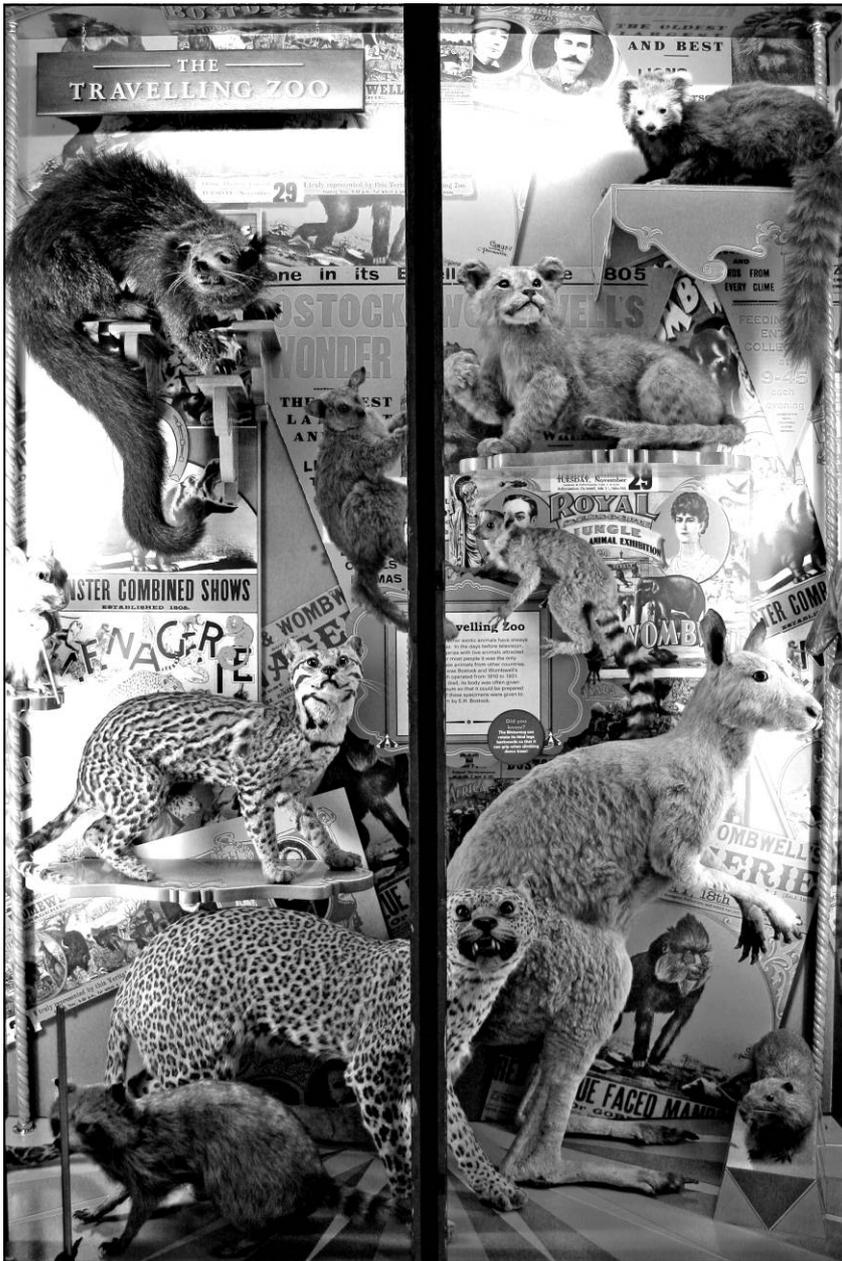


Fig. 5. The finished 'Travelling Zoo' display, with the boxing kangaroo.

Keeping things simple

Most of our interactives are more basic. A tiger skull, with the edges filed smooth and the teeth glued in, an elephant's tusk, an alligator – things which most visitors would never have had the opportunity to touch, an experience that will hopefully be talked about on the way home, or written about in class the next day. The bum nut is understandably a great favourite. Sounds to hear, smells to smell, and fur to feel. For the visually impaired, a life-size resin replica of our Great Auk enables them to talk about what their families have seen. One computer gives access to the webpages that describe the exhibits more fully, but no games, no buttons to push to see if you've randomly hit the right answer to a question you didn't read.

We have made extensive use of digital photoframes to liven up some of the displays. Apart from being cheap (between £29 and £59 in Jessops), they have the advantages of being reliable and silent.

We do have a resources trolley which the Interpreters are able to wheel out if things are slack. They can use the video microscope to look at feathers and butterfly wings, they can discuss how to stuff a squirrel, and they can talk more about the people who collected the specimens. But so far, the gallery has been very busy, and no-one wanders around with their children saying “can we go now?”. Somewhere among the visitors are the next generation of curators, the next generation of naturalists, the next Attenboroughs. Through putting specimens (lots of them) on show and letting them appeal to the visitors’ curiosity, we are engaging with the public in the best way that we can.

Happy Public

The following was over-heard during the Easter holidays – a small child has left his family sitting in the Rotunda cafe and poked his head into the new Natural History Gallery. He runs back to his table “Grandpa, grandpa, come and see – this is a REAL museum!”

Job done!

Acknowledgments

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Total budget - £74,000 (which included refurbishment work on other NH galleries).

A Tiger in a Library

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Abstract

A group from the Moston Steps Project (a complementary education service) worked with Manchester Museum staff to stage an exhibition about evolution and Charles Darwin. They picked a mounted tiger to be central their exhibition – bringing it into a public space for the first time in decades. The project was interesting on many levels, not least as an example of the different ways in which audiences can engage with the material culture of natural science.

Keywords

Community engagement; Manchester Museum; taxidermy; tiger

Introduction

Surprising things happen to natural science specimens. That a tiger from the Manchester Museum stores was exhibited in a local library in early 2010 was thanks to a combination of serendipity and the power of such spectacular specimens to captivate different audiences. A group of excluded teenagers picked the tiger as part of a project around evolution, giving the mount a new lease of life. Our intention in this paper is to outline the development of the project as an example of public engagement with natural science collections, and to reflect upon what this tells us about the varied meanings of particular specimens.

There is little data available for accession A.2375.8, *Panthera tigris*, in the Manchester Museum's zoology collection. But like its peers in other provincial museums (Andrews 2009), it probably arrived via a colonial acquisition route, possibly thanks to the activities of a Mancunian hunter sending spoils back to his local museum (cf. McGhie 2010). The museum holds the University of Manchester's natural history collections, transferred from the Manchester Natural History Society to the university's predecessor, Owens College, in the early 1870s (Alberti 2009). Like many other natural history collections, its greatest quantitative growth was in the decades around 1900 (Kohler 2006), corresponding with the peak of the British Empire, and it is likely that specimen A.2375.8 arrived during this period. It has been in the Museum's stores since then; shifted when the storage was re-distributed in the 1970s, and again at the turn of the millennium as part of some major building works. Otherwise, specimen A.2375.8 was left in relative peace. (The complete specimen that *is* on display was initially lent to the museum by a hunter, Keith Quas-Cohen, who had previously displayed it in his home.)

The Manchester Museum, like many other institutions across the country, was paying particular attention to the natural science collections (and their Victorian history) during 2009, Darwin's bicentenary and the sesquicentenary of *On the Origin of Species*. As an active partner in Darwin200, Henry McGhie (Head of the Natural Environments Team) co-ordinated a series of exhibitions and events together dubbed 'The Evolutionist: A Darwin Extravaganza' (McGhie, Brown and Horsley 2010), which included learning programmes, lectures, family events, and outreach.

The museum has included natural science specimens in its community engagement offer for some time, for example as part of the 'Collective Conversations' (see Manchester Museum 2010). Especially, natural history is a key component of an engagement programme 'The Museum Comes to You', 2006–11: a series of exhibits and object handling sessions funded by Renaissance North West and delivered at community centres, schools, and events across the city. It was as a result of a project at the intersection of 'The Museum Comes to You' and 'The Evolutionist' that tiger A.2375.8 saw the light of day.

The Moston Steps Project

Museum staff wanted to target groups of young people who would otherwise not have engaged with the Darwin commemorations. With a grant from the Wellcome Trust People Awards, and at the suggestion of

Manchester City Council Youth Service, the museum worked with excluded teenagers who were involved with a Steps Project (a complementary education service), which met at the Moston Youth Centre.

The project aimed to introduce young people to the opportunities and resources available in museums; to encourage them to develop new skills, improve confidence and raise self-esteem; to inspire them to think about the issues surrounding Darwin, his life, work and science and how this impacts on them; and, as a concrete outcome, to develop an exhibition. The museum had previously staged a display at a branch library in nearby Gorton, and thanks to this relationship with Manchester City Libraries, the project secured space in North City Library, close to Moston Youth Centre. The museum thereby hoped to gain a better understanding of young people's needs as visitors and service users; to provide access to some of its collection to audiences that are non-traditional visitors; to provide new community exhibition in an off-site venue; and to strengthen links with Manchester City Council library and youth services.

Over a five month period Andrea Winn (Curator of Community Exhibitions) and Rebecca Machin (Curatorial Assistant – Natural Sciences) worked once a week with Steps members. Together they embarked on several research trips, including visits to museums in Leeds and Bolton. There they compared Darwin-related displays, and looked at ways of exhibiting natural science collections. At local ancient woodland Boggart Hole Clough, the group compared local plant specimens with those that had been introduced from other places. The young people also explored the Manchester Museum's collections, conducted on-line research and worked with artist Chrissie Morgan to develop ideas for their own Darwin exhibition.



Fig.1. A Moston Steps participant experiencing the 'Tiger Trail' at Chester Zoo, October 2009. Photography courtesy of Moston Steps and the Manchester Museum, University of Manchester.

At both Manchester and Leeds museums the young people had been fascinated by the tigers on display. A further field trip, to Chester zoo, cemented the role of tigers in the project. The visit was designed to engage them with animals in a more detailed way: working in two groups of three, they selected a species that interested them, gathered some background information, studied their physical characteristics and behaviour and took photographs. They were given the opportunity to write and film a presentation based on this work at the zoo, and then to deliver it to museum staff, youth workers and peers the following week. One group picked bats, but the ‘tiger’ group’s work became the basis for the exhibition.



Fig. 2. Manchester Museum staff prepare for the exhibition at North City Library, January 2010. Photography courtesy of North City Library and the Manchester Museum, University of Manchester.

‘We chose to feature the tiger as it is the ultimate predator’, explained one of the young people, ‘a perfect example of successful adaptation. Its famous stripes act as camouflage and its large teeth and claws are perfect for catching prey. The tiger is part of the cat family, just like house cats and lions, but because of evolution it looks and behaves very differently.’ (Hegarty 2010). With their feline choice established, they visited the museum’s stores and selected specimen A.2375.8, which Manchester Museum staff painstakingly cleaned, prepared and installed in new cases purchased with the Wellcome Trust funding.



Fig. 3. The Moston Steps: Darwin exhibition, North City Library, Manchester, January 2010. Photography courtesy of North City Library, Ben Blackall, and the Manchester Museum, University of Manchester.

On Friday 22 January 2010 the *Moston Steps: Darwin* exhibition formally opened. The tiger was accompanied by the artworks the participants had made, botanical specimens selected at Boggart Hole Clough, a selection of other tiger specimens (including several skulls), and related objects from the museum. Five of the young people who began the project were present at the launch, which was also attended by 30 others,

including local MP Graham Stringer and Cllr Mark Hackett (who is the local councillor and Deputy Lord Mayor).

The tiger remained on display for three months, during which time it was used for a number of ‘story-time’ events, as well as formal school visits including over 300 children. Furthermore, over 40,000 visitors to the library passed by. ‘The tiger made us walk over,’ one visitor responded to qualitative evaluation undertaken on 5 April; ‘[I was] really interested and impressed by the skulls.’ Another was surprised to see some museum objects in their library; and one who had not visited the Manchester Museum before because they ‘didn’t think it would be interesting. Like the sound of it now.’

The participants’ feelings were mixed; half of the group had peeled away by the end, due to circumstances unrelated to the project. ‘It was interesting and a lot of fun’, recorded one (James) – another merely felt ‘It was ok but science / history is not my subject’ (Jack). But perhaps the best example of what participants took away from the project is encapsulated in a poem one of the group penned (Hegarty 2010):

Tigers can be scary
Tall dark and hairy
There’s some that are Indian
Some are Siberian
Some brown
Some white
But they all have stripes [...]

All these tigers have evolved from evolution
By they’re dying from pollution
And mad so what can we do?
to save a tiger or few.

Changing Meanings of the Specimen

The tiger, as we indicated at the outset, was already redolent of colonial acquisition routes. Its presence in Manchester is evidence of the city’s significance as a trading centre, and of the Imperial power of Britain. It tells us about Victorian/Edwardian attitudes to nature, and the continued fascination with large carnivores. But in the last year it has also become the materialization of the relationship between the young people and the museum. It is an excellent example of a new use for a historic specimen that combines its scientific, educational and cultural potential. The Manchester Museum is also involved in a project with similar ideals about innovative combinations of past and present, ‘New Light on Old Bones’, which involves the rich collections at Rossendale and Blackburn museums (Steadman and Craven 2010), funded by Renaissance North West.

Projects like these often uncover particular, characteristic meanings of specimens. A common indicator of the affectionate, local role that scientific objects can play is when they are afforded a nick-name, whether pre- or post-mortem. Most collections have examples – Chi-Chi the Panda and Peppy the Polar Bear are among the more famous ‘mascots’ – and sure enough, the tiger in question was quickly (and perhaps inevitably) dubbed ‘Tony’ (on specimens as mascots see Paddon 2010; for biographical examples see the chapters in Alberti forthcoming).

At least for the duration of the project, the tiger also became a work of art. The aesthetic merits (or otherwise) of taxidermy have been debated for centuries: the best mounts are not only valuable scientific specimens but also skilful sculpture. So too the tiger in question is an artwork, even in the secluded store. But during the brief spell in Moston, because of the radical change of context, alongside the (other) art on display the tiger also functioned as a piece of *public* art (see for example Knight 2008). Public works like these are commissioned for a particular purpose and appear in places that fine art normally would not, often for only a limited period of time. But it is not simply the *location* that makes public art public: ‘no more than placing a tiger in a barnyard would make it a domestic animal’ observed museologist Hilde Hein (1996:4), appositely. Rather, it is the process - the intended function - that makes art public, as in the case of the tiger’s appearance in the library.



Fig. 4. The tiger went viral: a visitor photographing the display, North City Library, Manchester, January 2010. Photography courtesy of North City Library, Ben Blackall, and the Manchester Museum, University of Manchester.

The tiger's renewed afterlife is thereby very revealing of the cultural meanings afforded scientific specimens. But perhaps its most significant value is in the success of the project. It became an emblem of the hard work, enthusiasm and commitment of the youth workers, young people and Manchester Museum staff. The process of developing ideas for and designing an exhibition has, according to both Steps workers and members alike, had an overwhelmingly positive effect on the confidence and self-esteem on the young people involved, some of whom have visited the Manchester Museum independently with their families and have asked if they can continue to work with the museum.

Acknowledgements

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The Odontological Collection at The Royal College of Surgeons of England

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Abstract

The Odontological Collection at The Royal College of Surgeons of England is a large research source that contains a variety of both animal and human cranial material. Accumulated over the past two centuries, the collection now consists of over 11,000 specimens that are used by researchers in a diverse range of fields. The array of species represented presents many possibilities for comparative anatomy studies. Although stored in species order, the material has been categorised into two groups; those displaying growth of the teeth and jaws, and those displaying pathology or malformation. The most extensive aspect is the primate collection, which consists of approximately 3,000 complete skulls that encompass every extant genus. This material is of particular relevance to those involved in the natural sciences. Catalogue details are available on the online catalogue 'Surgicat' (<http://surgicat.rcseng.ac.uk/>).

Key words: Comparative Anatomy, Evolutionary Anthropology, Odontology.

Introduction

The Royal College of Surgeons of England houses two museums; The Hunterian Museum and The Wellcome Museum of Anatomy and Pathology. The Hunterian Museum is our public museum which is open to all visitors. The Wellcome Museum supports medical training and can only be accessed by medical professionals or students on recognised courses in medicine and allied health subjects. It is these two institutions with which The Royal College of Surgeons is commonly associated. However, stored away from the public realm is the extensive Odontological Collection, which contains a vast array of human and animal cranial material. Of the over 11,000 specimens approximately two thirds are animal, representing a wide range of genera which is largely mammalian. Those involved in evolutionary anthropology have found the collection to be particularly valuable, specifically with regards to the primate skulls which are both diverse in species and extensive in number. This short article will provide a brief overview of the history and contents of the collection, with a particular focus on the animal material. It is hoped that this summary will be of interest to those involved directly or indirectly in the natural sciences and will encourage readers to direct those researching relevant spheres towards the Odontological Collection. Every item is recorded on our online catalogue 'Surgicat' (<http://surgicat.rcseng.ac.uk/>). However, as this is work in progress, not all of the animal specimens have a thorough description or image attached as of yet.

History to the collections

The collection has been accrued over the past two centuries and was founded by the former Odontological Society of Great Britain (now the Royal Society of Medicine, Odontological Section). As such, the original purpose of the collection was to aid training and research in dental development and growth. Such training was not to be focused on the human dentition alone and the donation of natural history specimens towards expansion of this collection was encouraged. Proof of this can be found in the original transactions of the Society, which state that the first acquisition to the collection was of a Hippopotamus skull donated in 1859. From here the accumulation of such material continued and although the fields of research using the material have diverged from dentistry alone, the original purpose of the collection in supporting scientific investigation has remained unchanged.

At present, the largest mammal specimens include a killer whale mandible (*Orcinus orca*), several Asian elephant skulls (*Elephas maximus*) and an array of both hippopotamus (*Hippopotamus amphibius*) and rhinoceros (*Rhinoceros unicornis*) skulls. Conversely, the smallest mammal skull in the Odontological Collection is from the chiroptera material and is of a fruit bat of the genus *Artibeus* (Fig. 1). At present the non-human primate collection contains almost 3,000 complete skulls which range from the largest in the world, the mountain gorilla (*Gorilla gorilla*) to one of the smallest, the greater dwarf lemur (*Cheirogaleus major*). Mammals make up the bulk of the material although a wide variety of other vertebrates are represented. Such a diversity of species holds great potential for further phylogenetic studies.



Fig. 1. Fruit bat skull. From the genus 'Artibeus' (Image copyright Royal College of Surgeons)

The variety of Ivory

The Odontological Collection contains over 250 ivories from a range of both terrestrial and marine mammals (Fig. 2). Most are fragmented or complete tusks although a few are carved dentures which have been fashioned from hippopotamus (*Hippopotamus amphibious*) ivory. Twentieth century dentures were commonly made from hippo ivory, as the tusk has a very thick enamel sheath making the denture much more durable under the stresses of mastication. A selection of these ivories has recently gone on temporary display within the Royal College of Surgeon's Inner hall which can be viewed by any college visitor.



Fig. 2. A selection of Ivory specimens from the Odontological Collection. The complete skull is of a tusked Babirussa (*Babirussa babirussa*). Items on the right hand side show elephant tusk segments with embedded weapons and reparatory reaction. The foreground left images show the tip of a hippo tusk alongside nineteenth century dentures carved from hippo ivory. (Image copyright Royal College of Surgeons)

The aim of the small display is to indicate the wide range of ivory-forming mammals, particularly as a common assumption is that ivory is solely derived from elephants and mammoths. The array in tusked mammal specimens represented by the Odontological Collection includes a variety of toothed whales and tusked pigs, alongside walrus (*Odobenus rosmarus*) and dugong (*Dugong dugon*) specimens. Furthermore, several of the elephant and mammoth tusks and teeth display pathologies such as cysts and infections. An interesting collection of elephant tusk portions has also been accumulated that reveal imbedded weapons such as a spear tip or iron bullet, inevitably used in poaching attempts. It is clear from the reparatory reaction of the dentine that each animal has consequently survived the attack and in some instances the segment of weapon has been nearly ejected from the tooth by the secondary dentine (Figs. 3 and 4).



Fig.3. Segment of elephant ivory with iron bullet. A thin extension of reparatory dentine has grown in reaction to the entry and pathway of the bullet. (Image copyright Royal College of Surgeons)



Fig. 4. Portion of elephant tusk showing the pathway of a bullet. Secondary dentine has grown in reaction to the bullet's pathway and has extended from the entry point through to the opposite surface of enamel where the bullet remains embedded in the tusk sheath. (Image copyright Royal College of Surgeons)

Rare specimens

For those involved in extinction studies, the Odontological Collection may prove of interest given its selection of almost 200 fossils encompassing a variety of specimens from the woolly rhino (*Coelodonta antiquitatis*) to the megalodon shark (*Carcharocles megalodon*). Furthermore, of the eleven thylacine specimens (*Thylacinus cynocephalus*), four are complete and undamaged skulls. Given present climate shifts and the affect environmental change is having on the natural world, the wide range of skulls, teeth and jaws of endangered species contained within the Odontological Collection add further value to this extensive resource. At present the collection holds skulls of many near-extinct animals such as the black rhino (*Diceros bicornis*), giant panda (*Ailuropoda Melaneuca*) and tiger (*Panthera tigris*). These specimens are to be recatalogued in due course so that prospective researchers can achieve easy access to images and a full description online before arranging a visit.

Extensive primate collections

The primate collection has formed the basis of several investigations in evolutionary anthropology. Such studies have benefitted from both the wide variety of species type and the extensive quantity of inter species skulls. The non-human hominid material encompasses all of the great apes. Patterns of growth can be noticed in both the teeth and cranial bones and such comparability can then be contrasted to the few instances of pathology and/or trauma. Minor calculus deposits and dental caries are noticeable in several specimens, through to marked pathology such as gross infection of the facial bones leading to osteomyelitis, as seen in one adult male gorilla (Fig. 5). Of the smaller primates, work is in progress on updating taxonomy records so that external researchers can access a clear list of all of the species represented in the collections, which can then be made available for further study in the museum department's laboratory. At present conservation and curatorial work on the primates is underway, which includes an extensive reboxing plan (funded by the Royal Society of Medicine, Odontological Section) and the drafting of new descriptions



Fig. 5. Adult male gorilla skull. This skull shows ante-mortem trauma to the maxillae and right zygoma which has resulted in osteomyelitis extending to the frontal bone. The maxillary incisors have been lost as a result of this trauma. (Image copyright Royal College of Surgeons)

and pathology reports for each skull. Such analysis has unearthed non-metric traits such as supernumerary teeth and metopic sutures alongside a variety of pathologies. All of the old paper catalogue records for these 2000 plus primates have been individually scanned and attached to their respective electronic record. As such the primate collection has a more thorough description available online than that of the avian, reptilian and fish material.

A major part of the collection, consisting of over 1000 specimens, was bequeathed to the college by the late primatologist William Osman-Hill (1901-1975). As a lifelong collector of natural history, Osman-Hill had a passion for zoology which is clearly represented by the material bequeathed into RCS care. In contrast to the majority of the Odontological material, Osman-Hill's collection encompasses specimens from all anatomical aspects including some wet preparations, skins and complete skeletons. In some instances Osman-Hill collected assortments of a specific anatomical feature, such his selection of penis bones which total almost 90 in number and range in species from the walrus (*Odobenus rosmarus*) to the bush baby (*Otolemur crassicaudatus*).

Summary

In conclusion, the intention of this short article is to convey the extent of the faunal material held within the Odontological Collection and the possibilities this material may hold for current research. At present a variety of disciplines have found a use for the Odontological Collection and hopefully will continue to do so given the improvements being made to both storage and online documentation. As an establishment dedicated to surgical training, the natural science collections of the Royal College of Surgeons are often overlooked. It is hoped that this brief review has provided a small glimpse into the sheer scope of this material, which is currently underused despite its immense variety and excellent preservation.

Live Animals in Museums and Public Engagement.

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Introduction

Having attended the recent NatSCA conference and AGM “Public Engagement in Natural Sciences” I have decided to produce this article on how live animals are used in museums from a public engagement perspective. I would like to point out that have not carried out any public surveys to support this article but I have 8 years of experience in this field.

Museums are always striving to be socially inclusive, making sure that they appeal to all audiences and reach everyone with an aim to have a positive impact on their lives. Indeed the mission statement of Tyne and Wear Archives and Museums is “to help people determine their place in the world and define their identities, so enhancing their self-respect and respect for others.” Live animals give the museum an extra dimension in appealing to a wider audience and inspiring visitors to think about the world in different way.

The Great North Museum

In our newly developed museum – the Great North Museum: Hancock, we have a number of live exhibits including Royal Pythons (Fig. 1), Bearded Dragons, Carpet Python, tropical marine fish, Horseshoe crabs, and a Dabb lizard. We have a Zoo Licence at the museum. This means that our premises have been inspected and the conditions and provision of care meets government standards. The museum also holds animal handling days, for handling selected reptiles, which are hugely popular.

Engaging reptiles

Wandering through the galleries I constantly find myself saying things like “*Can you see the little crab having his dinner?*”, “*The snake has just been fed so it’s curled up asleep*”, “*It’s really hot inside this tank because these lizards come from the desert in Australia*”. This adds an extra level of information for the visitor, they can see that the animal is alive and needs care; It isn’t a model or a taxidermied specimen. The parents / teachers / guardians get a surprise that the animals are real. Plus, I personally quite enjoy interacting with the visitor like this.

In my experience live animals evoke a number of reactions in our public. Either they are thrilled, want to know something more about them, want to touch them, want to ask more about how to keep them as a pet, want to know more about their natural environment and are happy to watch them and come back repeatedly to see what the animal has been up to, or they are not happy about the animal being kept on public view and used to entertain. It’s all about interpretation; how you interpret the fact that we are using a live animal in the gallery to support a theme or story that we are telling.

Increased visitors

A good example of the effects on visitor figures would be the installation of a permanent live animal exhibit in South Shields Museum and Art Gallery. This is a largely a social history / art museum. A gallery was set up to house the live animal collection from the Hancock Museum while the Great North Museum project was undertaken. The museums visitor figures noticeably improved and we found that teenagers/ young adults were visiting the museum regularly. Animal handling days were inundated with large numbers of family groups, teenagers and young adults. One to one discussions with people about the animals obviously had a positive effect. Visitors were engaged and interested in the animals and listened intently to information given. We saw that people returned to the museum regularly to see the animals on display. I feel that even if the visitor takes with them the fact that there are live animals in the museum and they are well cared for, and they might go and see them again, this is a positive outcome because that person is interested in something at the museum. If they read the text or ask staff a question about the animals that is a plus point.

Some museums go one step further with their live animal exhibits having an active conservation message,

using their animals to promote awareness of conservation issues in their natural habitat. Manchester Museum contributes to captive breeding programmes of endangered species. They aim to change attitudes towards world wide issues, and to engage the public to think about habitat protection. This relies upon the museum dedicating more resources but it is a good way of justifying why you have live animals in the first place; much like any zoo.

Public and live displays

So what does all this mean from a public engagement point of view? Will people spend longer in an exhibition if it has a live animal component? Will people visit the exhibition especially because there is a live animal in the gallery? Do people ask other people to come back and visit the museum another time because there is a live animal in the exhibition? People like to engage with live animals through handling sessions and it adds to their experience.

The current thinking in museums that collections, which would include live collections, may benefit the health and well being of individuals is an interesting consideration. Studies due to be published later in 2010 will shed light on this topic. A specific study into the effects

that live animals have on audiences from the point of view of health and well being would be an interesting addition to this study. Given that there is a lot of research into the benefits of owning a dog or cat, I think that being able to come to a museum to see an animal may have a similar impact.

Key considerations

So does this mean that every museum should have live animals in their galleries?

Other museums have asked me directly if keeping live animals in galleries is a good idea. I have advised them that live animals are a good idea if displayed and managed well. This is the key. The public will not stand for animals to be kept in inadequate conditions, and neither should museums. They will question the very best of conditions and make their feelings well known to the animal keeper, the management and possibly even the RSPCA.

Museums need to consider a few basic things before committing to having live animals in a gallery;

- Can the museum care for the specific animals? This means, will someone take responsibility for the welfare of the animals and be there when things go wrong? I have been known to take sick animals home to care for them on a daily basis.



Fig. 1. “Sid” our Royal Python on display supporting the geology story of the Mesozoic. (Image copyright Great North Museum).

- Can the museum continue to fund their requirements e.g. food, heating, vets bills, other equipment into the future and ring fence a budget for them? This is especially important in today's financial climate; live animals cannot be compromised.
- Does the museum have room to house them properly? When a species of snake reaches 12 ft can the museum expand its housing? Has the museum researched the species it wants to keep and is it able to source them from a reliable source?

For example, we wanted to have a green tree python to support the story of camouflage in tropical rain forests. A large tank with an upright tree support for an arboreal species was installed in the gallery. However, the problem came in sourcing a snake. Wild caught snakes were out of the question; it is illegal to import tree pythons, wild caught snakes are prone to infections and stress very easily. It is also unethical, we thought. So, we sourced a captive bred snake, but a baby because it is expensive to purchase an adult. We bought it from a local breeder, and viewed the parents to check for health issues before we purchased it. We have now had the snake for about 2 years and it is not on display yet as it is too small for the large display tank. But we will put it on display when it reached the appropriate size. This shows all of the things you need to consider when selecting display species.

Summary

In my opinion, museums should always have a zoo licence to give themselves credibility, even if they only have a couple of fish tanks and a gecko. This shows that they are committed to the well being of the animals in their care. Information on how to apply for the licence can be found in the DEFRA website. The application for the licence is a thorough and lengthy process involving local government departments and veterinarians. It can also be expensive, as you need to advertise your intentions in local and national press.

So, in conclusion, live animals are a good addition to the material museums display as long as they are justified. In that they support the stories you are telling with the display, or they are part of a discrete display that plays a part in conservation of species and education. It is really important that you know what you are getting into. Don't choose really exotic species that need to eat specific things every single day unless you can commit to this. Do research the species you want to display thoroughly. Have a good vet that will come out to your museum if needed. Build up a network of people who are experts in e.g. large reptiles, so you can ask advice if needed. Make sure your museum has all the health and safety procedures in place. Apply for a zoo licence. Most importantly, have a dedicated member of staff to take responsibility for the animals.

I would be interested to know what you all think about this issue on the NatSCA JISMAIL.



Fig 2. "G.T.P" our Green Tree Python. (Image copyright Great North Museum)

Preservation of botanical specimens in fluids

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History

Although the history of fluid preservation for zoological specimens can be traced back to Ruysch (1710) and less tangibly earlier still, the history of fluid preservation for botanical specimens starts more recently. Although plants have been preserved in alcohol for sometime (since at least c. 1830), the majority have been preserved dry as herbarium specimens. At Kew, Victor Summerhayes (curator of Orchidaceae) started a fluid-preserved collection during the 1930s and which subsequently expanded to other plant taxa.

Fixation and Preservation Biochemistry

Formalin has been used as a primary fixative to alter slightly the chemical structure of protein molecules, by utilising the electrophilic carbonium/ carbenium ion (as found in formaldehyde), to a more stable structure that is unassailable by bacteria. Most plant material has been fixed in alcohol, formol-acetic-alcohol or (more recently) Kew mixture. Alcohol fixation is known as pseudo-fixation since the material is only dehydrated and guarded against bacterial decay whilst in such fluid. The alcohol additionally denatures some structures found in plants, particularly the tetrapyrrole groups found in many natural pigments, such as chlorophyll.

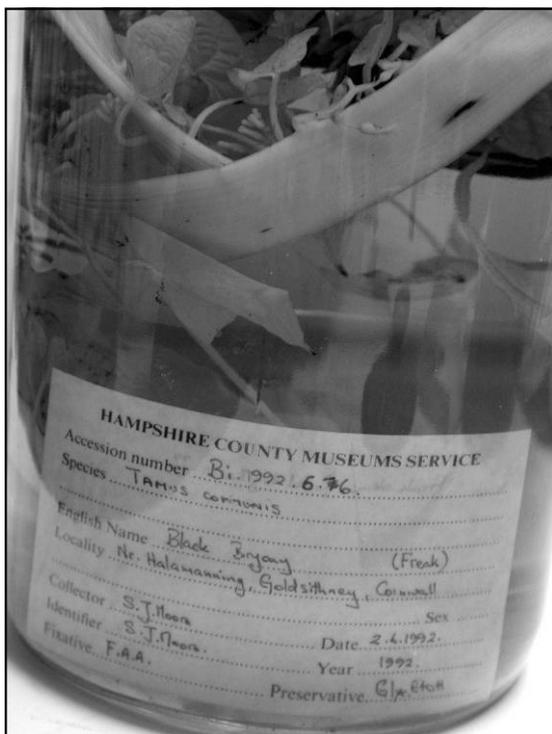


Fig. 1. Black Bryony fixed in FAA and preserved in IMS-glycerine – most (but not all) of the chlorophyll pigment is in solution.

Alcohol is also difficult as a storage medium since it is flammable, it evaporates more rapidly than other preservative fluids and has a lower osmotic pressure than that of the normal fluids found in living plants.

Alcohol does have the benefit of preserving DNA structures intact whereas longer-term preservation in formaldehyde-based preservatives and fixatives will chemically alter the DNA double helix over time. To combat evaporation and slightly reduce the hazard of flammability, humectants, principally glycerol/ glycerine, are added from 5 to 10% in concentration and will also help to prevent specimen embrittlement.

Fluids used

Kew mixture was devised as a plant fixative to complement the preservative Copenhagen mixture and these two are the principal fluids used in botanical collections these days and will also satisfactorily preserve fungal sporocarps.

Note that the formula often varies slightly according to institutional recipes! A more complete list is provided in Bridson & Forman (1992) and Tredwell (2005) provides more information in her leaflet.

More specialised fluids containing copper salts were used to pseudo-preserve chlorophyll although they were only substitutes and specimens preserved in these fluids often have a blue-green tinge.

Colour-preserving/substitution fluids are mentioned in Moore (in Carter & Walker, 1999) and originally in Wagstaffe & Fidler (1968).

Kew mix (Kew recipe for this fixative):

4-5% of formaldehyde solution (37.6% formaldehyde)

53% IMS (Industrial Methylated Spirit)

5% glycerol

37% water (de-ionised)

OR: 1 part 100% formalin (37.6% formaldehyde): 10 parts IMS (absolute): 1 part glycerol: 8 parts deionised water.

Copenhagen mix (preservative):

53% IMS (Industrial Methylated Spirit)

5% glycerol

37% water (de-ionised)

OR: 10 parts IMS: 1 part glycerol: 8 parts deionised water.

Formol-acetic-alcohol (FAA) (fixative):

48ml 100% formalin (37.6% formaldehyde)

160ml IMS (Industrial Methylated Spirit)

8 ml Glacial Acetic acid

320 ml deionised water.

There are other fluids that involve the use of propylene glycol, poly-ethylene glycol, phenoxetol (2-phenoxy-ethanol) &c., so it is difficult to know what to add to a near-dry specimen – if some special fluid was used as a fixative/preservative and without any data in a notebook or on the label, then the standard procedure of using Kew and Copenhagen fluids should be adhered to.

Rehydration

Dried out specimens can either be mounted as herbarium specimens but if required to be returned to a state of fluid preservation, the following procedure can be followed, bearing in mind that any DNA structure will be compromised by the process.

Rehydrate specimen in warm 3-5% Decon-90 solution in deionised water to about 50°C until the specimen appears to be normally flaccid. Rinse in water and if required, trapped air bubbles should be removed under a mild vacuum at this stage. If the specimen is somewhat fragile, it can be fixed in Kew mixture first but must be returned to water before vacuum treatment since solvent and formaldehyde fumes will damage the vacuum pump and contaminate the pump oil.

Specimens may then be fixed in Kew mix overnight and then transferred to Copenhagen mix for storage.

Fixation and preservation notes should always be included on the label, especially if these are specialised or new.



Fig. 2. Parachute mushroom: the diminutive *Marasmius rotula* fixed and preserved in Kew Mixture.

Labels

These will be severely disadvantaged if attached to the jar exterior:

Fluids can leach from the jar if moved or if the fluids are glycol or glycerol-based, these can creep out of ground glass and screw-capped jar closures and seep onto the labels making them rather illegible.



Fig. 3. Exterior labels on jars that have become contaminated by fluid seepage and become partly or almost totally illegible!



Labels can also detach and become lost or mixed with those from similar specimens (Fig. 4).

Fig. 4. A detached label – how long until it becomes lost?



Some label papers can also affect the pH of the jar contents; therefore Goatskin Parchment (Arjo Wiggins) is still the recommended label medium for use inside the jar but should not be so large that it obscures the specimen and fluid levels.

Computer-generated labels look really good and are alright as such but the printing may disintegrate within 15 years (pers. comm.): it is currently undergoing experimentation in the USA. For more information and/or involvement post questions on the NH-Coll website (find via Google). The bottom line is that essential information should still be recorded with pigment ink.

Storage parameters and ideals

Botanical specimens stored in fluids should be away from any light or UV source as they are very susceptible to bleaching. Temperature parameters should be between 10 and 20°C and RH levels should be maintained between 50 and 60%. Appropriate hazard data should be attached to doors and adequate lighting and ventilation should be provided together with an eyewash station.

Acknowledgements

I would like to acknowledge help from staff of the Botany Department at the Natural History Museum, London.

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NEWS*Notices, Adverts & Meetings***NatSCA Seminar****Identification of Osseous and Keratinous Material**

Leeds Museum Discovery Centre

2nd November 2010
9.30am – 4.30pm

£35 members/£50 non-members

Dr. Sonia O'Connor of the University of Bradford will be running a one-day workshop on how to identify materials such as ivory, bone, antler, horn, baleen, tortoiseshell and imitations thereof. Structure, properties and appropriate care will be discussed as well as a practical session using objects from the collections at Leeds. You are welcome to bring your own objects for use in this session.

For further information: clare.brown@leeds.gov.uk**GCG Seminar: 200 years of West Country Sea Dragons**

Strode Theatre, Street, Somerset

Following on from the highly successful PalAss review seminar 'Sea Dragons of Avalon', GCG have teamed up with three of the meeting organisers to run a similar event to mark the 200th anniversary of the birth of Thomas Hawkins, the eccentric collector of Street and Lyme Regis marine reptiles.

It is anticipated that the meeting will take place on Friday 23 July 2010 followed by a field excursion on Saturday 24 July to visit some of the modern Lias quarries in the Street area.

The meeting will focus on Thomas Hawkins, his collections, legacy and modern collecting. Topics will include current locations and state of Hawkins's specimens, including issues of acquisition, mounting methods and conservation, as well as restoration/forgery. We will investigate Hawkins's life and work, his contemporaries, and Hawkins's (metaphorical) heirs - the modern collectors, preparators and curators, as well as site conservation.

Please contact: [Dr Leslie Noe](mailto:leslie.noe@thinktank.ac) - leslie.noe@thinktank.ac

NEWS*Notices, Adverts & Meetings***'Call for Abstracts- A Pest Odyssey 2011: Ten years Later'**

In 2011, it will be 10 years since the memorable Pest Odyssey conference at the British Library that inspired many of us to engage in the challenge of Insect Pest Management within the Heritage sector.

This international conference at the British Museum will be an opportunity for the profession to focus on developments that have need made in those 10 years, highlighting international priorities and how these have changed.

We are seeking papers on the Insect Pest Management themes:

- Preventive strategies and case studies
- Control strategies and treatments (pest, climate change and research)
- Innovative solutions and re-evaluation of existing treatments
- Training and awareness

Abstracts no longer than 400 words should be forwarded to Dee Lauder at dee.lauder@english-heritage.org.uk by September 1, 2010. Successful authors will be notified 1st October 2010. Completed papers will be required by 1st February 2011 to ensure that post prints will be produced and mailed to participants by year end 2011.