Natural Sciences
Conservation Group

Newsletter

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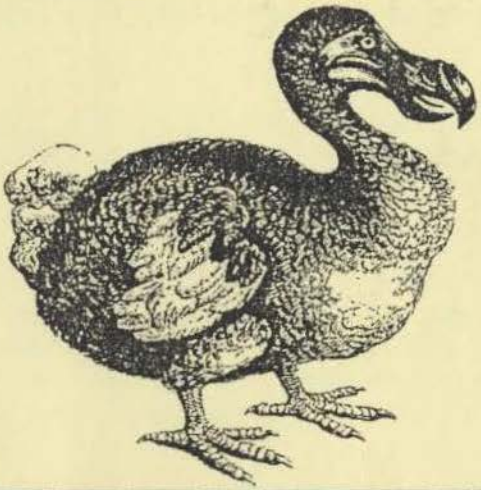
NATURAL SCIENCES CONSERVATION GROUP



AGM 1999 Leicester

The Society

The Natural Sciences Conservation Group promotes: research and exchange of ideas; advances in technical and ethical standards; the public profile of the conservation and preservation of natural science collections and objects; training; and publications.

Membership

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

Annual Subscription

Students (UK only)	£8.00
UK personal	£10.00
Overseas personal	£12.00
Institution	£25.00

Newsletter

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

Advertisements

1/4 page	£15.00
1/2 page	£25.00
Full page	£50.00

Instructions for Authors

Material should be type-written and double-spaced in A4 format and if possible accompanied by a text file or Word document on disk (Dos-formatted). The pages should be numbered and the position of any tables and/or figures should be indicated on the hard copy. The names of animal and plant species should be underlined and the authority name given in full for the first time used, thereafter they may be omitted. All references should be given in full. Articles and other items for inclusion should be submitted to the Editor at least three weeks before the publication date.

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

Editorial

Welcome to issue 12 of our newsletter.

"The beauty and genius of a work of art may be reconceived, though its first material expression be destroyed; a vanished harmony may yet again inspire the composer; but when the last individual of a race of living beings breathes no more, another heaven and another earth must pass before such a one can be again".
W. Beebe, 1906

I am sitting here in front of an empty screen trying to find away of introducing myself as the new editor. I thought of starting with humour, but I know of but a handful of conservation styled jokes, most of which require that I put a disclaimer on the front cover to the tune of "contains explicit material". Next, I had thought of the informal: "Hi, my name is Darren...", but that seemed too clichéd. After much deliberation I have just typed what was going through my mind, which may scare some of you!

As an insect-mad naive fifteen-year-old boy I ventured into the Herbert Art Gallery and Museum, Coventry to begin my two weeks work experience. Little did I know then, that working as an entomologist in Museums would become a career, especially after my careers teacher at school said "nobody will pay you to do your hobby" (they do, but not much!). Our chosen line of museum work is most certainly a vocational one, one of the most frequent comments I hear from friends and colleagues is "love the job, but the pay is crap". We seem to be given ever more areas of responsibility, and red tape from above without the recognition (or pay) we deserve. However, one of the best feelings in the world is to see a specimen or collection that you have curated-conserved in its rightful place in the collection or out on display for all to see.

Now to business, I hope that I will be able to live up to the high standards set by our last editor, Donna Young. I would also, as I think we all would, like to take this opportunity to wish her the very best of luck with her new curatorial role as keeper of young hominids. Changes to the Newsletter are few and I hope that they will meet with your approval. Finally, I would like to express my thanks to Juliet Hay for her invaluable assistance in the production of this Newsletter.

Darren Mann

Views from the Chair

Dear Members,

I would like to publicly thank Nick Gordon and his colleagues for organising our recent AGM and conference at Leicester, and making it such a success. The first days were most notable for offering us a vision of Chris Collins in black PVC trousers, (if you weren't there it's your own fault and I shall explain no further).

I would also like to thank the many members who attended and contributed to the 2 day event, it was good to meet you all and put faces to names.

My congratulations to all speakers and not least to our expert panel who passed down to us their combined wisdom on the last day. These sages of the natural science conservation world were off set by the ever youthful William Lindsay who brought to us the lighter side of conservation at the Natural History Museum.

As regards our conference curry. You certainly could not fault it on quantity.

It is proposed that our AGM next year will take place in Scunthorpe! "Why," you are all asking has the group decided to be so efficient as to begin organising our millennium meeting so early, and why have we picked such an exotic location?

The group has been approached by the Biological Curators Group and the Geological Curators Group with the view to holding a large meeting/ conference with all natural science groups next year in honour of the millennium. We thought it would be rather churlish of us to refuse this offer. Details have yet to be finalised but we will have our own speakers on conservation issues, and possibly trips to local a museum to see recently conserved plesiosaurs. It is not our intention to see our grouped swamped by our bigger cousins.

Another landmark is this very edition. This is the first edition to be

brought out by our new Editorial team headed by Darren Mann. My thanks to Darren and his colleagues. The newsletter is only as good as those who write for it. Please make every effort to send in articles and news to Darren.

Unfortunately we have recently lost Nick Gordon from our committee. Nick has been an active member of the committee for a number of years and will be missed. He has had to resign due to other work commitments, but intends to remain part of the group. I have no doubt we will be seeing him again at meetings and AGM's. Adios Nick.

My regards to you all
Bob Entwistle.

The NSCG Website

We are currently in the process designing our new Website, which we hope will be up and running in the New Year, as long as the millennium Bug doesn't destroy the world. We have the kind help of Paddy Collis in the setting-up of our site and I would like to thank him for all of the work he has done so far.

If there are any members who wish to contribute or have any comments or suggestions on what you would like to see on the site, please contact the Editor.

BCG, GCG and NSCG Conference

Access to Collections
3rd-4th April 2000, Scarborough

Call for Papers: Papers and posters on any aspect of collections access, community and outreach work, Best Value or joint working partnerships etc.

Please contact: Nick Gordon, New Walk Museum, New Walk, Leicester, LE1 7EA Phone: 0116 2554100 Fax: 0116 2553084

Conservation Focus
News and Events from the Conservation World

Press Release

MGC Appoints Policy Officer and Assistant Environmental Adviser

The Museums and Galleries Commission has appointed Sophie Carter to the new post of Policy Officer and Catherine Atkinson to the role of Assistant Environmental Adviser.

Sophie Carter lectured at the University of East Anglia where she gained a PhD from the School of World Art Studies and Museology. During her PhD studies, she was a research fellow at the Yale Center for British Art in New Haven, USA, where she also worked on temporary exhibitions and gave gallery talks. Reporting to the Deputy Director, the Policy Officer is responsible for providing support and gathering information for the MGC Directorate.

Catherine Atkinson takes up the post of Assistant Environmental Adviser. She joins the MGC from the British Council, where she was Assistant to Director, Arts. A qualified Conservator, Catherine has been involved in projects at various sites in this country and abroad, including stone conservation at the Albert Memorial, and ceramic and stone conservation while an Intern at the J Paul Getty Museum in the United States. Her role at the MGC will involve working with the Environmental Adviser and offering advice on applications for both Lottery funding and the Government Indemnity Scheme.

Biological Curators Group Meetings

An Introduction to Molluscs: Collection, Curation and Display

Oxford University Museum of Natural History
January 31st 2000

BCG Visit to Kew
June 2000

A study trip to Kew Gardens is being arranged, to visit the gardens and have a behind the scenes tour. Details will be in the next Biology Curator

BCG Training Meeting
January 2000– Documentation

The meeting will consider the state of biological documentation in museums, looking at MGC Registration requirements, documentation software, data standards and current initiatives.

Details of all BCG Meetings from: Nick Gordon, New Walk Museum, New Walk, Leicester, LE1 7EA Phone: 0116 2554100 Fax: 0116 2553084

Call for Entries for the Conservation Awards 1999

The MGC is now inviting applications for the 1999 Conservation Awards. The Awards, organised by the Museums and Galleries Commission (MGC), are also supported by English Heritage and the National Preservation Office, which is based at and supported by the British Library. This year there are two awards:

- The Award for Conservation which recognises excellence in completed conservation or restoration projects
- The Student Conservator of the Year Award, which highlights the achievements of students and the high standards of UK conservation training courses.

To be eligible to apply for the 1999 Awards, conservation projects must have been completed between 1st January 1998 and 30th September 1999. Application forms will be available from October 1999 from the Awards Co-ordinator at the MGC. The closing date for applications is 3rd December 1999 and the Award ceremony will take place at the British Library in March 2000.

Further Details from: Museums & Galleries Commission, 16 Queen Anne's Gate, London, SW1H 9AA

Jerwood/MGC Cataloguing Grants

In the final round of the Jerwood/MGC Cataloguing scheme, which aims to support the researching and cataloguing of collections in the UK's non-national Museums, grants have been awarded to the following:

Perth Museum and Art Gallery **£9,900**
To research the Perthshire herbarium and produce a website with a searchable database and virtual exhibition on the history of the herbarium and local flora.

Buckinghamshire County Museum **£9,400**
To create a catalogue and image database of the most significant elements of the museum's collection of Ice Age fossil mammal bones, from Pitstone-Marsworth chalk quarry site.

Oxford University Museum of Natural History **£9,400**
To research, photograph and produce an illustrated catalogue of the Corsi Collection of marbles, granites and other decorative rocks and minerals.

The WWW

For those of us fortunate enough (or not as the case may be) to have internet access, a small section of the Newsletter is to be dedicated to those websites that members have found useful in their quest for knowledge. Here are two for starters. Please let the Editor know of any other sites you consider worth mentioning.

The Museum and Galleries Commission
Includes items of MGC news, grants, a bookshop and a useful free download advice sheets on museum issues and conservation.
http://www.museums.gov.uk

Museums of the World
This page includes an eclectic collection of World Wide Web services connected with museums around the world.
http://archive.comlab.ox.ac.uk/other/museums/world.html#museums

Oxford University Museum of Natural History and Designation Challenge

Wendy Shepherd, Administrator, Oxford University Museum of Natural History, Parks Road, Oxford, OX1 3PW

In July 1999 Chris Smith, the Minister for Culture announced a £2.7m boost for 49 of England's best museum and gallery collections. The grants – the first part of a £15m museums fund for the best regional collections would be made available to museums and galleries, designated by the Government for their outstanding collections. One of the projects approved for funding was submitted by the Oxford University Museum of Natural History.

The aim of the project is to increase access to the collections through a documentation programme meeting SPECTRUM (The UK Museum Documentation Standard). Increased access will be achieved by conversion of the existing catalogues to electronic format and publication in searchable format. The grant will also provide funds for the electronic publication of a photo-library of key specimens that will be integrated with, and accessible via, electronic catalogues. Primary cataloguing of newly acquired collections and direct integrated with published electronic databases is also planned.

To achieve the project targets the Museum will be appointing both full and part time staff over the two and a half year duration of the funding. The staff will be employed not only to computerize the catalogues and generate the photo-library but to also release existing staff from their technical duties to carry out the necessary research on collections and databases prior to electronic publication.

The Museum has received a grant of £32,000 for the first 6 months of the project. Further funding of £230,000 will be released upon completion of initial targets.

Minutes of the Annual General Meeting

Venue: New Walk Museum, Leicester
Tuesday 22nd June 1999, 2.00 pm - 2.40 pm.

1. Introduction and consideration of agenda
Item 10 "The Editors Report" was added to the agenda. The agenda was then approved by all present.
Topics listed for AOB consisted of Insurance for Freelancers.

2. Apologies for absence
Apologies of absence were received from Vicky Purewal, Tracy Seddon and Kirsten Walker.

3. Minutes of the Annual General Meeting on 17th April 1997
Paul Brown presented the minutes of the last annual general meeting. Kate Andrew proposed and Nick Gordon seconded that they be accepted and signed. Bob Entwistle duly signed the minutes as being correct.

4. Matters arising from minutes.
There were no matters arising.

5. Chairs report.
During the last twelve months, the main preoccupation of the group has been the accreditation debate. Myself and other committee members have applied for Fast Track Accreditation. I urge any members who fit the criteria to apply now for FTA, the final date for applications being the end of July 1999. It is by having Professionally Accredited Natural Science conservators that we will raise the profile of Natural Science Conservation. The "Slow Track" standard route for accreditation will take longer and be more expensive. I have been a trial assessor and am on the accreditation appeals panel where I have been able to assure other members of the suitability of at least one Natural Sciences Conservator who has applied for FTA. Our committee discussed at length over whether non-conservation degrees/qualifications should be considered as counting toward accreditation and the committee was spilt. Each application should stand on its own

merits, arguing each case to convince the selection panel. I understand that some members of our group have applied for FTA on this basis. We continue to be part of the National Conservation Council (ex Conservation Forum and Association of British & Irish Conservators or ABC), a combination of Paul Brown and myself have been representing us at meetings.

We have had two meetings during the year, the previous AGM admirably organised by Tracy Seddon and Donna Young and their team and generously hosted by the National Museum and Gallery of Merseyside. I would like to thank all those institutions and individuals involved for a superb event. I'm sure this year's meeting will be just as successful. In February we supported the BCG Geology for Beginners day at Scunthorpe hosted by Steve Thompson, with committee member Glenys Wass giving a lecture. We hope to organise more of these practical "hands-on" days in the future.

We offer congratulations to Vicky Purewal of National Museums & Galleries of Wales for winning the Student Conservator of the Year award for her composition analysis and study of pesticide residues on herbarium sheets and to Kate Andrew who was runner-up for the National Award for Conservation for her work on the wall-mounted Saurian fossils at Whitby Museum.

We are sorry to loose Tracy Seddon and Kirsten Walker from the Committee. Tracy was active in the group from the very beginning and helped to organise two of the early conferences. Donna Young is also vacating the post of Editor due to an outbreak of children. She has done marvellous work over the last few years and we wish the standard to continue. A newsletter is only good as those who write for it so I appeal to all members to support and contribute to it. We now have a new editor!

We have a new membership leaflet and you will find a copy of it in your delegates' folder. Please give your leaflet to an unbeliever and get them signed up. We must continue to grow and although we have a healthy number of members, I believe that there are a lot more interested people who would join if we could reach them.

A number of Natural Science Conservator posts are frozen, two at Ipswich and at Derby Museum and my own post at Ipswich is under threat. Conservation and especially Natural Science Conservation is not having a good time at present. Out sourcing is the money-saving buzzword for employers. There is no substitute for having a properly trained conservator (/ curator) on the premises who knows the collections and cares for them on a daily basis.

I would finally like to thank Nick Gordon for organising this event and to you all for attending.

6. Secretary's Report.

There have been six committee meetings through the year with attendance of members as illustrated below in the attendance log: -

	18.6.98	10.9.98	9.12.98	11.3.99	5.5.99	21.6.99
Kate Andrew	Written & Telephone contributions at each meeting				✓	
Paul Brown	✓	✓	✓	✓	✓	✓
Rob Enwistle	✓	✓	✓	✓	✓	✓
Nick Gordon			✓	✓	✓	✓
Simon Moore	✓	✓	✓	✓	✓	✓
Vicky Purewal	✓		✓	✓		
Maggie Reilly		✓			✓	
Tracey Seddon	✓	✓	✓	✓	✓	
Kirsten Walker						
Glenys Wass	✓	✓		✓		✓
Donna Young	✓	✓	✓	✓	✓	✓

7. Membership Secretary's report.

The Group had 99 members last year plus the British Library subscription, which makes 100. 73 UK personal members, 6 overseas personal members, 16 UK Institutional members and 4 overseas institutional members. The corresponding figures for last year are 68 UK personal members, 1 overseas personal member, 10 UK institutional members and 2 overseas Institutional members. We therefore have increased membership by a modest amount, across all categories. We are a small but dynamic organisation but we'd like to be bigger and more dynamic! There are problems with collecting overseas subs, which need to be paid in sterling, and the cost of a sterling draft can be discouragingly high. In order to make it a little easier for potential North American members, one arrangement we employ at the moment is to collect subs in person, so should anyone we know (from the NSCG, BCG, GCG) be going to the States/Canada for SPNHC or other conferences then let us know. Only one commission would only be paid for converting cash dollars to sterling.

8. Treasurer's report.

For period 1st February 1998 - 31st January 1999.

Current account - Midland Bank 1442341

Balance brought forward from 1st February 1998	**£3182.25**
Income	
73 UK personal memberships @ £10	£730.00
5 Overseas personal memberships @ £12.00	£60.00
18 Institutional memberships @ £25	£450.00
2 Overseas institutional memberships @ £35	£70.00
Bank Interest	£94.94
Advertising fees	£100.00
Sale of back issues Newsletter	£19.00
Donations	£5.00
Conference	
Registration fees 23 @ £15.00	£345.00
Registration fees 10 @ £20.00	£200.00
Advertising fees	£520.00
Sub total	£2593.94
Total income	**£5776.19**

Expenditure	
Newsletter production	£194.25
Conference expenses	£752.30
Membership fee to Conservation Forum	£200.00
Committee expenses	£148.70
Total expenditure	**1295.25**
Balance at 31.01.1999	**£4480.94**
Actual balance on January 1999 statement	**£4480.90**

Petty cash

Income	
Balance brought forward from 1st February 1998	£16.01
Expenditure	
Nil	
Balance (cash in hand)	£16.01

Notes

1. The guidelines from the Charities Commission on the preparation of annual accounts state (p. 4) that for charities with 'neither income or expenditure over £10,000 that accounts must be prepared but may be on a receipts and payments basis'. We comply with this.
2. The UKIC treasurer has now provided a letter (see accompanying document) to say that the funds previously 'held in trust' by us are now transferred to us. By our accounts this was the sum of £1241.23 but UKIC seemed to list in their books the larger sum of £2589.00 as owing to us. Following an exchange of e-mails with Helen Jaescke, the UKIC treasurer, it appears (sadly!) that our figure is correct and the bigger sum is wrong so there are no further funds to be paid to us from UKIC.
3. The accounts were sent to Velson Horie and William Lindsay who kindly acted as auditors and deemed the accounts to be in order. There is no requirement for us to do this but it seems good practice and so is worth continuing.

These accounts and the minutes of the AGM will be sent to the Charities Commission a.s.a.p.

William Lindsey asked what we would spend our money on. MR said that we have spent much of it on the new membership leaflet and the proposed "Ten Agents of Deterioration" book.

9. Proposal to accept the accounts

Jenny Bryant proposed that the accounts be accepted which was seconded by Louise Bacon. The meeting accepted the proposal *nem.con.*

10. Editors Report

Four copies of the Newsletter have been published in the last year (issues 8-11) and continuing with the Ten Agents of Deterioration inserts on Theft & Vandalism, Temperature & Relative Humidity and Light & Ultra Violet, which continue to generate much interest. The next subject will be "Pollution" and please if you have any papers or anecdotes on this subject could you send them to Nick Gordon at The New Walk Museum. Future subjects will be "Physical Forces" and "Custodial Neglect" to complete the Ten Agents. There are plans to publish the inserts as a book with further contributions in the year 2001 and this to be edited by Donna and some of the NSCG funds could be used for this project. Donna has done all the publication in house at Liverpool NMGM even with high work commitments. The cost of outside publishing was explored and found to be too expensive.

Thanks were given also for all those who have contributed articles to the newsletter.

The ISSN number has been assigned for the Newsletter [ISSN 1462-978X] and can be used for the earlier issues prior to the award of the number. We send copies to the British Library, The Getty Library, ICCROM and The Natural History Museum. We will soon have a WEB page available on the Internet that will include contents of the Newsletter and information from the new membership leaflet. There is also a new poster, which can be taken by any member to advertise and promote our work.

Donna is standing down as Editor so who will replace her? Two or three from the same or different organisations can work as a team. NSCG funds (£70-£90) can be made available for a copy of Microsoft Publisher for use by a new Editor.

12. Election to the Committee

Five posts have become vacant and four names put forward prior to the AGM.

Kate Andrew for the post of Treasurer to replace Maggie Reiley. Nominated by Julian Carter and seconded by Louise Bacon.

Three ordinary member posts were available vacated by Tracy Seddon, Kirsten Walker and Kate Andrew.
Adrian Doyle, nominated by William Lindsey and seconded by Lorraine Cornish.
Victoria Purewal, nominated by Angus Gunn and seconded by Aileen Collis.
Maggie Reilly, nominated by Donna Young and seconded by Lindsay Loughman.

An Editorial team was rapidly formulated from the membership present The Trustee (senior editor) to be Juliet Hay, with assistance from Darren Mann, Matt Stephens and Steve Thompson, collectively nominated by Kate Andrew and seconded by Jo Hatton. [Due to work problems Juliet Hay had to decline the senior editor post and so the duty was handed to Darren Mann.]

As no election was required PB proposed and David Carter seconded that the names put forward be accepted *en* block for election to the committee. The candidates were duly elected *nem.con.*

13. Election of Auditors

MR nominated Velson Horie and William Lindsey to continue as auditors. Passed *nem.con.*

14. AOB.

Insurance for freelancers.
Simon Moore reminded the membership of the competitive insurance cover available from Crowly Colosso for freelance NSCG members for both Public Liability and Professional Indemnity. He reported that a price of £250 for both was quoted by this company which is a very competitive price being at least half that of other quotes. This would be an important saving for our freelance membership and such a chance should not be allowed to pass. Anyone who is interested should contact Simon.

AGM Photo-opportunity:

Conservation of Bird Mounts

Step 1: Ensure specimen is deceased.

AGM Papers
Showing it off

The Nature of Derbyshire Gallery
How it was made

Bill Grange, Keeper of Natural History, Derby Museum & Art Gallery, The Strand, Derby, DE1 1BS

The 'Nature of Derbyshire Gallery' at Derby Museum, finished in late 1997, is the outcome of four or so years of work, carried out by our Design team, and several volunteers, plus me. It forms a unit with the Geology Gallery completed in 1991. The two galleries together make the 'Derbyshire Nature Gallery'.

The gallery embodies many traditional display techniques, but combined in such a way as to make for a most unusual and visually exciting gallery. Like many other gallery projects completed throughout the country in the last thirty years or so, it concentrates on the local environment. Its basic purpose is to show the diversity of wildlife in Derbyshire; how it is related to the underlying geology and how the different species interact with each other and with the human species. I also intended that it was to be understood and enjoyed by people of all ages and academic background. I use the word 'enjoyed', as I firmly believe that a museum gallery should give pleasure as well as instruction - and I don't consider the two to be mutually exclusive!

It is a tall order! For one thing the natural environment (in so far anywhere in Derbyshire can be called truly natural) is extremely complex, to say the least. Inevitably, the story has had to be simplified. Anyway, the space available for the exhibition was not huge. It is also physically impossible, in a static display, to put over many aspects of natural history. There is also a limit to what any museum visitor can absorb. To decide what to leave out was the hardest part.

The gallery includes an introductory section, making the link with the geology gallery, and dealing with conservation issues. One feature of this is 'A Day in the Life of A Hedgehog' in which a series of specially posed specimens of this much-loved animal portrays the species contending with traffic on the by-pass, being accidentally forked by a gardener and facing other human-created hazards, as it goes about its business.

The main part of the gallery evokes a journey through Derbyshire, one of the most diverse of all English counties, starting in the far north and ending in the city of Derby in the south. It does this through a series of reconstructions, 'dioramas', of actual places, laid out in a geographical sequence, but with the seasons shifting to give a picture of a year's journey.

These places, chosen to give a 'cross-section' of Derbyshire's wildlife and not necessarily important sites or nature reserves, are: the summit of aptly named Bleaklow, a particularly wild part of the gritstone moors in the north of the county; a small defile or 'clough' opening into the River Derwent, north of the Howden Reservoir and Padley Wood, an ancient oak woodland at Grindleford. After passing through a model limestone cave the visitor encounters three locations in Monsal Dale, a delectable valley in the limestone country: an ash wood, a limestone grassland slope and the River Wye (this is the Derbyshire Wye, of course - no connection with the more famous one of the Welsh borders) in the valley bottom. Then they visit the River Derwent at Allestree just north of Derby; a small pond to the west of Derby; a roadside verge at just inside the city boundary; the abandoned Friargate Station in the city centre and, finally, a garden of a terraced house.

I visited each location; many more than once, to take photographs, make drawings and notes and collect specimens. What might have seemed to some people as jolly days out in work-time, were in fact quite hard work, (honestly!) When faced with the real outdoors in the context of having to devise its replication in the Museum, I was often nearly driven to distraction! Eventually I decided on one or two possible small areas of the chosen location as candidates for reconstruction. Then, armed with half a carload of plant material (no rarities were collected by the way), rocks, fragments of timber and other environmental bits and pieces, I was in a position to begin each habitat model within the huge case units. The latter were made

was carried out in modeling clay - the correct texture achieved by the clay being pressed into latex rubber moulds, taken from the bits of bark, rock, etc, collected on site. In all these aspects of the work I was greatly aided by a number of volunteers.

Each model environmental element had then to be painted. A stippling technique, using torn bits of plastic sponge, often gave the best results. Various water features were made using sheet Perspex to which was applied clear fibreglass bonding resin.

I preserved the plants by freeze-drying them in a special machine. Unfortunately, this process does not retain the colour of both foliage and flowers and this had to be applied artificially, and very carefully, using dilute acrylic paints. In this task, my volunteers were again of invaluable help.

Anyone coming into the temporary work-area at the end of the unfinished gallery would have seen a bottle, sitting on the worktable, labelled 'relaxing fluid'. They would be forgiven for thinking this was for my benefit. It was, in fact, used to 'relax' dried insects. Much of the insect specimens for the displays were obtained from our old collections - those without data being selected. These, of course, were in the typical symmetrical and unnatural postures of reference specimens. To make them suitable for the environmental settings they were placed in a closed plastic container, with wadding lining its bottom moistened with the relaxing fluid - a solution of anti-fungal phenol. After a couple of days I was able to manipulate the insects, for example raising up the wings of butterflies into a more natural posture - and keeping them in place with an arrangement of pins and card strips for a day or so, when they became dry and rigid again.

The bird and mammal specimens required for the display were partly obtained from our existing collections - in which case I was stuck with the

partially by a contractor and by our resident joiner, Roger Wakefield.

I commenced each setting by doing a background painting, referring to the photographs taken on fieldwork. Then, the three-dimensional foreground took shape. The forms of boulders, outcrops, and tree-trunks I made in chicken wire, to which was glued paper or cloth strips. The final modeling

poses they were given by the original taxidermist - and from newly acquired material. Like many other natural history keepers, I am constantly having to stress that we don't rely on people going out with guns, as the Victorian curators No, the motor car and that other killing machine, the domestic moggie, plus the propensity of many birds to kill themselves by flying into patio windows, provided much of what we needed - the resultant corpses being brought to us by members of the public. This was an opportunity to ask the taxidermist, mainly Don Sharp of Wollaton Hall, Nottingham, to mount the specimens in 'action poses', illustrating many different facets of behaviour. As a result of all this we have, among the many specimens in 'frozen action', a sparrowhawk catching and eating a blue tit, a female blackbird feeding its young, a badger curled up in the depths of its set, red admirals and small tortoiseshells feeding on bramble flowers, and dragonflies mating.

Rocks, trees, plant material, and animals were gradually assembled for each setting, as far as possible re-creating each bit of habitat as accurately as possible. The design team then adjusted the spot-lighting with great skill, to simulate different natural lighting conditions, really bringing the settings alive. The effect of low autumn sunlight back-lighting the fronds of bracken in the oak woodland display is especially stunning.

A special feature of the gallery is that the glazed apertures, through which the visitor views the reconstructions, are not boring square openings, but are irregular in outline. My original 'ragged hole' idea was greatly developed by Steve Ferguson of our design staff, who both designed, and laboriously cut out, multi-layered naturalistic creations, each tailored to match the contents of each diorama and which are among the most memorable features of the new gallery. In addition to the main opening, smaller apertures enable selected species within each setting to be single out for detailed examination, while insects and other small animals are viewed through special eye-pieces penetrating the case units.

The design team, which also included Chris Frith, Richard Beckett, and Claire Foley, also made the walk-through cave, complete with model stalactites and stalagmites, produced the captions on computer, from my 'script', and devised other decorative features. Appropriate literary quotes,

including some classic poems, are reproduced in large decorative script above each environmental setting, conveying something of the inspirational side of natural history. The display is housed in the oldest part of the museum building, which dates from 1870, and it is a credit to the Designers that this modern display blends so well with the Victorian architecture.

The displays are complemented by a small visitors' study room, with reference books, leaflets and children's work-sheets. A further section, incorporating a hands-on discovery bench and temporary-exhibition facility is to be added soon.

Although I said earlier that I simplified things there is, after all, so much in the gallery, that one tour is not enough to take it all in. But this just is as I want it - hoping to encourage repeated visits! However, the main purpose of the displays is to stimulate the visitors to explore the real Derbyshire, or at least to open their eyes to what is in their own localities. It is not a substitute for the actual countryside or urban environment. My motto is 'get them in to get them out'. I also hope that the gallery will help people to realise that all of us have a role to play in conserving our wildlife in the face of what often seem overwhelming destructive forces. If it sparks off such an awareness, even among a fraction of our visitors, then I will feel that all our efforts have been worthwhile.

A Task of Dinosaur Proportions
Collecting, Conserving and Exhibiting the "Rutland Dinosaur"

John Martin, Leicester City Museum, New Walk Museum, New Walk, Leicester, LE1 7EA

In 1965, Leicester City Museum had on its staff two geologists and four biologists. When the Manager of Great Casterton clay pit telephoned to say he thought one of his staff had found a dinosaur, it was Ian Evans –

Keeper of Biology at the time and the person he happened to know – that he asked for. The museum's Landrover and trailer were despatched to collect the five tonnes of rock that had already been excavated and put to one side. Five tonnes of potential dinosaur, but no geological data.

This is the story of how Leicester's Cetiosaurus was recovered from this fairly inauspicious beginning.

Cetiosaurus was a sauropod dinosaur. It was a Middle Jurassic genus, known from fossils found in Buckinghamshire, Oxfordshire and Northamptonshire as well as in Rutland, and it was one of the animals described by Richard Owen in the "Report on British Fossil Reptiles" (1842) that introduced the term 'dinosaur' to the world. Owen thought Cetiosaurus was a giant crocodile, so it does not qualify as one of the first dinosaurs named, but the genus was eventually restored to its rightful place in the canon of British dinosaurs (Phillips 1871).

The Williamson Cliff brickworks had, and has, its own quarry. The clay, used for making bricks and other more specialised products, is part of the middle Jurassic Rutland Formation (Bradshaw 1978), the beds previously known as the Upper Estuarine Series (Judd 1875). These are mainly cream, buff and multi-coloured clays and silts with rootlets, all interpreted as freshwater or lagoonal deposits. In Rutland, they usually rest upon a weathered surface of the Lincolnshire Limestone Formation – a surface that appears to have been weathered sub-aerially to produce a karstic landscape in a subtropical environment. In some places, however, there are deep, steep-sided hollows in the top of the Limestone and these are full of black clay; presumably, these hollows were ponds in Jurassic time. The dinosaur skeleton came from one of these pond clays. A contemporary photograph shows the digger driver who found the fossil and who reported its discovery to the quarry manager. One or both of these people happened to be amateur fossil collectors, and this is where the good luck began. Most of the skeleton was preserved in nodules of ironstone (clay-siderite/hematite nodules) at the bottom of one of the black pond clays. The nodules must have looked entirely nondescript, except for a few bits of weathered bone protruding from their sides, and indeed the clay was only being excavated because emptying the clay-filled hollow would cre-

ate a sump to drain the quarry. It was a combination of the digger driver's keen eye and the small-scale mechanisation of the quarrying operation at the time (and for this particular sump-digging job) that ensured that the fossiliferous nodules were collected, an occurrence of extreme rarity in modern quarrying.

After the call to Leicester Museum, the Landrover and trailer were despatched within a few days. Meanwhile the quarry operation continued, and the ironstone nodules were helpfully removed from the clay and heaped at the side of the quarry. This made collection and loading onto the trailer easy but of course, destroyed the geological context of the skeleton – its position, the relationship of the various elements to one another, and the nature of the surrounding clay. It was not until 1976 that M. Bradshaw (*pers com*) visited the quarry as part of his Doctoral thesis fieldwork, and the stratigraphy and sedimentology of Williamson Cliff quarry were recorded. More recently, I and others (R.G. Clements and G.A. Weightman, unpublished site recording for RIGS listing) have revisited the quarry, identified the approximate find-site and recorded and re-interpreted similar lithological sequences elsewhere in the quarry. The actual find-site is now restored and built over.

The bulk of the collected material – perhaps 5 tonnes of matrix - was first placed in an off-site store. This was to be a big job, and it is not completely finished even now after 33 years!

In 1965-68, a few nodules were worked on, and about six neck vertebrae were prepared. This work was done by M.D. Jones, then Assistant Keeper of Geology. In 1968, Jack McIntosh, a sauropod expert and associate of the Carnegie Museum of Natural History, Pittsburgh, visited Leicester to assist with identification of the newly prepared bones. The find was published as Cetiosaurus (Jones 1970). After this, however, other work intervened; staff changed, and the famous fossil was more or less forgotten. However in 1980 new staff (the writer and J.A. Cooper) 'rediscovered' the material when a museum open evening with a Victorian theme required fossil material to be prepared using traditional hammer and chisel methods. After that evening, preparation began in earnest, for we had realised what an important specimen we had.

As noted above, the fossil bones were mostly preserved in clay-siderite/hematite nodules, although a few were clear of mineralised concretions and could be prepared by simple removal of the black clay matrix. The original bones were also heavily mineralised, mostly by iron oxides; the details of bone histology and structure were beautifully preserved but the fossils were often very delicate and softer than the matrix, so preparation had to be by painstaking mechanical methods. The equipment used included large, medium and small airpens (ARO, Pisani and Desoutter), electric vibrotools, airbrasive techniques (various abrasive powders), hammer and chisel, needles and scalpels. Consolidant (Butvar B-98 - polyvinyl butyral, in isopropyl alcohol (propanol)), was applied at every stage of the preparation process, and repairs were carried out using HMG adhesive or a thick solution of Butvar.

Sometimes, although the fossil bone was missing because of weathering or collection damage, the form survived as a natural mould in the rock matrix; this was used to cast the missing element, using dental casting plaster. Where symmetry or morphological interpolation allowed it, missing sections of individual bones were modelled, again using plaster; these sections were distinguished from original fossil bone by the finishing paint colour applied. The whole job of preparation, including description, illustration, photography and documentation, extended over 4 years, and was carried out by museum staff (principally the author and J.A. Cooper) and volunteers. Ultimately, a partial skeleton (albeit the most complete British Jurassic sauropod to date) was produced. It included most of the 14 cervical vertebrae and ten dorsal vertebrae, elements of the sacrum and 14 caudal vertebrae, together with ribs, parts of the pelvic girdle and fragments of the limb bones.

For the planned display, the missing elements of the skeleton were modelled on the equivalent bones in other specimens of Cetiosaurus, for example in Oxford and Stroud. Where the elements are still unknown for the genus Cetiosaurus, the replicas were based on other sauropods in the family Cetiosauridae, or even on sauropods generally, in North and South America, North Africa and China. Research on the comparative anatomy and taxonomy of the Leicester specimen gave welcome opportunities for

visits to the leading museums worldwide with sauropod collections, and helped raise the international profile of Leicester Museums. The replicas were sculpted using fire-retardant polystyrene foam (obtained in blocks up to $2m^3$) and given a skin of plaster, both materials chosen for their cheapness and low weight. In the final display mount some skeletal elements present in the fossil, including ribs, limb bones and tail vertebrae that were either too heavy or too delicate for mounting in the gallery were also replicated.

The mounting method was cheap – by necessity – and innovative. Traditionally, dinosaur skeletons have been displayed using a steel frame onto which the bones were threaded or mounted. The frame had to be preconstructed, as far as possible, to fit the expected shape of the skeleton. The result was often a skeleton in an anatomically impossible pose, with disarticulated joints. The 'Leicester method' suspends individual elements in loops of stainless steel welding wire; where the wire passes against the fossil bone, polythene tube is used to protect the specimen, and the wires are hung from a ceiling-mounted steel (1cm spacing) mesh. Cable clips and crimps permit adjustment and fixing of the wires at ceiling height. Apart from cheapness (the primary consideration) and speed, the method has a serendipitous extra advantage: it is possible, for the first time with display of an articulated original dinosaur skeleton, to ensure the anatomical accuracy of bone-to-bone relationships as the skeleton is built up. The hind limbs determine the position of the sacrum, from which point the natural curvature of the vertebral column – joints in neutral position, or within their limits of up, down and sideways flexure – is determined by observation.

As a result of our experience with the mounting method, I was surprised to discover how many traditional dinosaur mounts, and for that matter artists' life reconstructions of dinosaurs in exhibitions and books, featured impossible poses and disarticulated skeletons. Ultimately, the completeness and quality of preservation of the Leicester Cetiosaurus vertebral column and our stumbling into the 'Leicester method' gave rise to an interest in biomechanics, anatomy and physiology that developed into a mini 'school' of vertebrate palaeozoology. Its members are to be found in America, Germany, France and Australia as well as in Leicester itself. The aim is to

produce reconstructions of dinosaurs and other extinct archosaurs based on study of available fossil evidence, rather than on hypothesis.

After more than thirty years, Cetiosaurus is still not finished. Although a cluster of research papers have been published (e.g. Martin *et. al.* 1998), and the anatomical description of the Leicester specimen and a review of the genus Cetiosaurus are ready for submission, there are still inaccuracies in some of the replica elements and we are concerned about signs of environmentally-induced problems with both original fossil material and the plaster and polystyrene replicas. In any case, we should now probably be thinking of casting the whole skeleton in resin for display so that the originals can be returned to the store – although that would put Leicester in the same position as most other 'dinosaur museums', no longer showing visitors the real objects in their care. The question is: should a provincial museum, like Leicester, attempt a project this ambitious? My answer is: of course, we should do it. First, because the necessary research is a vital part of our business, whose product and unique selling point is expertise. Original research on local specimens of international importance makes exhibitions up-to-date and authoritative, and makes museums places of which local citizens can be proud. Secondly, because we need the publicity – even of appearing on 'Blue Peter' – and the increase in visitor numbers it brings.

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Rebuilding Mr. Swales' plesiosaur.

Mark Evans, Leicester City Museums, New Walk Museum, 53 New Walk, Leicester, LE1 7EA

This is the story of the reconstruction, research and display of a relatively complete skeleton of the Middle Jurassic plesiosaur *Muraenosaurus leedsii*. It demonstrates the kind of results that can be obtained from apparently uninspiring beginnings.

Plesiosaurs are a group of extinct, secondarily aquatic reptiles that were a significant component of the marine fauna in the Mesozoic Era between 200 and 65 million years ago. The Oxford Clay Formation of the Peterborough area has been recognised since the end of the last century for the exceptional preservation and completeness of its vertebrate fauna (Leeds, 1956). Alfred Nicholson Leeds (1847-1917) of Eyebury near Peterborough assembled a well known collection of reptiles and fish, the majority of which is now in the Natural History Museum, London.

Specimen History

The specimen in question (LEICT G18.1996) was presented to the Leicester Town Museum in 1902 by Mr R. Swales, a shopkeeper from Peterborough. Swales had been donating fossils from the Oxford Clay and overlying Pleistocene deposits of the Peterborough area to the museum since 1896. It is worth noting that Swales was collecting at the same time as A. N. Leeds. The specimen was presented as a series of 89 lots, for example, accession 125/1902 is given as fragments of the skull, and the locality was given as "Oxford Clay, Peterborough".

There is no evidence of any previous work on the specimen such as old

glue or mends, or that the specimen has previously been on display. It is possible that it was displayed in the "open storage" style palaeontology gallery known to exist at the beginning of this century.

The project

This project began in December 1995, when Arthur Cruickshank, our Honorary Research Associate, assigned volunteer Richard Forrest to the task of reassembling the specimen. Richard wanted to learn about plesiosaur anatomy, and the best way to do that is through hands on experience. My own direct involvement started in January 1997, when Richard had other commitments, which curtailed his volunteering to a large extent.

By 1995, the specimen was in some 3000 pieces spread over a number of drawers in the geology store. All old labels from the drawers were retained and are now in the specimen's history file. The numbering system originally used on the specimen was rejected for two reasons. Firstly, it was impossible to say exactly which lot each piece would have originally belonged under, Secondly, the numbering system in use between 1902 and 1907 resulted in 35 parallel runs of accession numbers, one for each subsection of the museum's collections (Sizer, 1962). Codes, in this case Xw, were later assigned in order to differentiate the separate runs. All objects from this period need to be renumbered to bring them into line with the format used for the rest of the collections and the computerised documentation system. The specimen, previously known as 125-213Xw'02, is now G18.1996.

The elements of the skeleton were reassembled using HMG Paraloid B72 tube glue so all joints could be reversed with acetone if needed. The bone was in good condition, and so no consolidation was needed. Structural support was provided where needed with lengths of narrow dowel (actually sticks from cotton swabs) that were attached with Paraloid. Sand trays were used to support joints as the glue set.

Reconstructing the scene

As work progressed, it emerged that the specimen was remarkably complete, and the decision was made to display it for Science, Engineering and Technology Week (SET[7]) in March 1997. As we had a reasonably com-

plete specimen, we wanted to show the whole skeleton. There are two ways in which a skeleton can be displayed: an anatomical reconstruction or a taphonomic scenario. An anatomical reconstruction involves re-articulating the skeleton as if it was still surrounded by the soft tissues. The bones should to be relatively undistorted, and an armature or similar system is needed to support the separate elements. A taphonomic scenario recreates part of the process by which the dead organism becomes part of the fossil record (i.e. its taphonomy).

Although our bones were free of matrix and preserved "in the round", there were several instances of distortion where bones had been crushed on to each other. While this would be a disadvantage in an anatomical mount, it does allow us to recreate a taphonomic scenario. Current palaeontological collecting practices involve mapping the positions of skeletal elements *in situ*. However, in the case of the vast majority of historical specimens this information was never collected or has been lost. We decided to use the various taphonomic indicators and recreate the scene on the seabed near Peterborough 165 million years ago.

Marks showing where bones had been crushed onto each other or had been in contact were especially common around the limb girdles, and showed how the body had ruptured and collapsed. In the pelvic girdle, the sacral vertebrae lay, semi-articulated, on top of the ischia along with the sacral ribs. These elements were cemented together with harder matrix, preserving their positions. In the pectoral girdle, marks showed where the right scapula and coracoid had been crushed on top of the right humerus, which was folded underneath the body. The right radius was still cemented to the left coracoid with matrix, and confirmed this interpretation. This suggests that as the plesiosaur's dead body sank to the seafloor, the right forelimb touched down first. Other marks showed where ribs overlapped each other, and where the anterior trunk vertebrae had lain between the scapulae.

The bones were found to show two different preservational styles. Some areas were dark brown with a well-preserved surface while; others were buff-coloured with a slightly softer surface. In addition, traces of black material were found on the undersides of some of the caudal vertebrae.

This differential preservation is known to reflect the orientation of the bones on the seafloor (Martill, 1987). The buff bone projected up into the water column, while the dark brown bone was buried in soft sediment. The black material is the remains of soft tissues replaced by microorganism mats (Martill, 1987). Using these indicators, we could therefore orient the various skeletal elements with a fair degree of confidence. In certain areas, such as the neck, there was little information on bone contacts preserved, so we resorted to the anatomical arrangement of the elements.

Only the humerus was present from the left forelimb, and the distal end was missing, having been bitten off. What remained showed large tooth marks. The culprit was probably the large pliosaur *Liopleurodon ferox*, the top predator of the Oxford Clay Sea. The fact that the proximal part of the limb was still with the rest of the skeleton suggests the plesiosaur was attacked rather than scavenged. It seems that it escaped the predator, only to die later of its injury.

I concentrated on the skull fragments, and realised that the skull was more complete than we had thought at first. There was enough preserved to allow a reconstruction to be made. I constructed a simple mount out of acrylic sheet and rod, aluminium sculpting wire, and milliput epoxy putty to support the elements we had. Missing portions of bones were sculpted using milliput and wire, having first coated the bone surfaces with Paraloid to act as a separator.

The display and afterwards

The specimen was put on display for the SET weekend in March 1997 as planned. It was laid out in four flat topped display cases pushed together, and measured approximately 3.5 metres long. The bones were arranged according to the devised scenario using vermiculite as a soft base of a neutral colour. The display was staffed by Arthur, Richard and myself along with other Earth Science staff, and after the weekend, the display was put into a small vacant temporary exhibition gallery for a few weeks. The display has been dismantled, but the specimen has since been the focus of still more rebuilding and research. The bitten humerus has prompted Richard to undertake a study of the patterns of bite damage on plesiosaur limb bones. I have produced a new reconstruction of the skull of *Mu-*

raenosaurus leedsii based on this specimen (Evans, in press), and am now looking at other specimens to fill in the missing pieces.

Both Richard and I were volunteers when we undertook the rebuilding of Mr Swales' plesiosaur, and we had the luxury of spare time. Now I am employed by the Museum Service, and I doubt that I would be able to find the time to start it all over again. Volunteers are a valuable asset in this sort of long term, labour intensive project.

Epilogue: Redisplaying Mr. Swales' plesiosaur

1999 is the 150th anniversary of Leicester City Museums, with special events and a celebratory exhibition. The curatorial staff nominated objects for display, and I chose the *Muraenosaurus* skeleton. As the exhibition neared completion, we rebuilt Mr Swales' plesiosaur again. This time the bones were arranged and supported on plastazote, with grey gravel in-between substituting for the Oxford Clay substrate. The gravel was chosen, as it is more inert than the vermiculite used previously, and provides more contrast in colour with the bones. The exhibition will be up until the beginning of 2000, and I hope to have the plesiosaur, or part of it, in the new Evolution galleries in the future.

Acknowledgements

Thanks are due to John Martin, Arthur Cruickshank, and, of course, Richard Forrest for their input and hard work on the plesiosaur project.

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Conservation for Display - a designers perspective Conservation vs. Design or informed compromise

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Introduction

Museums provide a wealth of opportunities for designers. Each exhibition is different from the last, with diverse and fascinating stories to tell plus wonderful, awe-inspiring objects to reveal. It is a veritable Aladdin's cave, or is it? Are we placed in a straight jacket by the curators list of requirements? How does designing for museums and in particular the Natural Sciences affect the design process?

We need to look at the role of the museum and how the design team fits into this and importantly how the roles of the museum affect our ability to design successfully.

The definition of design according to Chambers dictionary is: To plan and arrange in an artistic manner. So why the need for designers in a museum environment? Because museums have a duty to display and explain the collections in their keeping. However, this isn't the only purpose of a museum. The main function of a museum is the collection and conservation of materials for posterity. The difficulty is that these two main functions of the museum are in direct conflict with one another. The ideal environment in order to maintain collections is that they should be kept in complete darkness with carefully controlled temperature and relative humidity without human interference. The ideal environment for the visitors is one in which they can view and understand the collections, in an environment that is comfortable yet stimulating, so that they feel involved in the experience. So displaying collections in the pitch dark and asking them to rest their lungs and stop breathing isn't going to draw the crowds in.

Role of the Designer

It is the role of the designer to assist the visitor in understanding the language of the objects and the story that they tell, by the physical arrangement and appearance of the exhibition, in a way that is stimulating and enjoyable whilst at the same time providing a secure environment for the ob-

jects on display - not just from theft and vandalism but also from environmental conditions. We provide the link between the two functions of the museum - the wish to preserve the objects and the wish to show them as fully as possible to as many people as possible.

Compromise

Linking these functions produces a compromise.
Nevertheless, design is all about compromise and I would add to the definition of design that it is to plan and arrange in an artistic manner given a set of conditions.
There is compromise because of conditions created:-

- by the finite space available
- by the budget constraints
- by the time available
- by the target audience by corporate design and other policies
- by the staff involved
- by the nature and scale of the project
- and of course the collections themselves with their conservation requirements.

It should be noted that these conditions should be considered from the outset as they form the starting point for any design and are best included in the outline design brief along with the aims and objectives of what one wants to achieve in the exhibition.

How do we design?

There are a number of stages in design and production to be worked through before the exhibition is complete.

Outline brief

Essentially - what you want to achieve.

Discussion

We like to spend time with the rest of the appointed exhibition team and in particular the project manager in order to really understand what the requirements of the job are. Often what isn't said is as important as what is said.

Concept

An exhibition style and a general layout are developed.

Detailed brief

Objects and text finalised.

Final design

Style, detailed layout and working drawings

Production

There is more to successful design than just presenting information. Feelings and impulses must be transmitted to aid appreciation and understanding. In other words, we need to create atmosphere.
This can be created by: -

- Lighting
- Use of structure
- Triggering memory
- Colour

We also need to move the visitor around the exhibition in such a way that they feel in control and therefore comfortable. We can prompt action even though the visitor may be unaware of how he is being paced or propelled by: -

- Sense of space
- Enticement
- Teasing
- Size of graphics
- Arrangement of objects

We can punctuate the storyline by breaking down the exhibition into more digestible sections, each section containing repeated elements. We can also emphasise the underlying importance of a section in the exhibition by: -

- Use of graphics
- Positioning of objects
- Using other senses.

Conservation Issues

We have seen how the processes and tools are used by the designer, but how is this affected by the conservation requirements of Natural Science objects. Specimens range from minute to enormous, light to incredibly

heavy. They can be highly sought after by collectors or as a schoolchild's souvenir. There are objects, which can be easily damaged by touch and so must be kept out of reach from caress. Security is vital. Security doesn't only apply to theft and vandalism, it also applies to keeping the objects safe from incorrect temperature and relative humidity, from damaging ultra violet light and from dust and pests. How does a designer deal with these problems without losing atmosphere?

Lets look at the problems how they can be dealt with.

Cases - this has an impact on the layout and consequently how the visitor is paced around the gallery.
Budget - cases are very expensive. With limited budgets, all money might go on cases and other aspects suffer as a consequence. Cases can all be large and bulky imposing restrictions on the layout of the exhibition and consequently how the visitor is drawn through the exhibition.
Atmosphere - If you can't touch you are not utilising an important sense.
Lighting - spotlights can cause glare from reflections off the cases. Partially sighted visitors will suffer as a consequence.

Relative Humidity - RH

If the gallery doesn't have a carefully controlled environment then the designer is looking at cases where precise conditions can be maintained unless the object is on display for a very short space of time.

Lighting

Low levels of lighting are required to prevent rapid deterioration of the organic specimens. It is important for a designer to remember that 50 lux doesn't stop deterioration but it is the lowest level that a normally sighted human can make out form and colour without distortion. Seeing isn't a problem to most at these levels but creating a dramatic effect by contrast lighting has to be carefully engineered, as humans cannot adapt to high levels of contrast.

UV filters add cost to lighting, which, as mentioned has a knock on effect to what can be produced for the money available. As a designer, you don't have the range of contrast lighting.

Temperature

This also has an effect and should be carefully controlled. This causes the came type of problems to a designer as RH.

Dust and Pests

Dust is always a problem with open display and cleaning can cause problems. Cases can of course alleviate the problem.

Therefore, do these conservation requirements act as a straight jacket? It is the knack of the designer to turn the problems into advantages after all they are just additional conditions to add to the long list that has already been mentioned. To say there is informed compromise is right. We can design the cases so that the visitor has to interact with the case. The specimens have to be viewed from different angles in order to see the full display. Exciting lighting can be used to great effect. It can be used to imply habitat and temperature. It can highlight objects of particular interest. It is probably one of the most effective ways of producing dramatic effect. A stand-alone object also helps create atmosphere and can help punctuate the exhibition thus speeding up / slowing down the pace of the visitor. By including handling objects, the importance of the cased object is highlighted. If money allows including associated activities and interactive add to the experience and, hopefully, repeated visits. In addition, we should not forget that the specimens have lots going for them.

- They are beautiful, awe inspiring objects in their own right.
- The largest to the smallest.
- Easily identifiable objects.
- There is something for everyone.

Conclusion

Design is all about compromise.
There may be problems, preferred options but designers thrive on problem solving. Whatever the topic, the task of the designer is essentially the

same - the attention of the visitor must be drawn to the objects and displays, to alert them to receive the scheme and the story behind the exhibition whilst providing an acceptable environment for the objects on display.

The curator makes academic sense of a collection, but the designer has to translate this into visual sense. It is very much my ethos and that of the design section here that the design of the arrangement should be subordinate to the objects themselves. As Margaret Hall comments in her book On Display, Other designer may use banners in the wind outside or a magnificent entrance to attract attention and introduce the subject. The mechanics of design should never be obvious, the designer being no more noticeable than the good pianist accompanying the soloist

Further Reading

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Society for the Preservation of Natural Science Collections (SPNHC) Annual Conference, Washington DC, 28th June – 3rd July 1999

Caroline Buttler & Vicky Purewal National Museums & Galleries of Wales, Cathays Park, Cardiff, CF1 3NP
CB was supported in part by a travel grant from the Museums & Galleries Commission

The 14th Annual SPNHC meeting took place in Washington, DC, hosted by the Smithsonian Center for Materials Research and Education and the National Museum of Natural History. This was the largest ever SPNHC meeting with over 200 delegates registered.

The Smithsonian Institution encompasses 17 museums and 10 research centres, it cares for over 140 million artifacts and specimens. One major problem was finding time in the busy conference schedule to visit museums such as the Air and Space Museum and the Museum of American History. The Smithsonian Folk-life festival was also taking place on the Mall in front of the Smithsonian Institution; this enabled us to try Romanian and South African food during the lunch breaks.

The conference lasted six days, the first three were devoted to workshops, committee meetings and tours of the host institutions and the final three were technical sessions.

The National Museum of Natural History is an impressive building opposite the Smithsonian Castle. The entrance is dominated by a large stuffed elephant and by the smell of naphthalene!

The age of the exhibitions varies within the museum, the new Janet Annenburg Hooker Hall of Geology, Gems and Minerals was opened in 1997, but the older exhibitions are still interesting because of the high quality of the material on display. Tours were available of all the main departments and here we could appreciate the scale of the collections held in the Museum. It was, however, incredible that in the Department of Paleobiology, which contains over 40 million specimens, there is no dedicated conservator.

A tour of the Museum Support Centre was organised for Tuesday afternoon. This complex includes the Smithsonian Center for Materials Research and off-site storage for the National Museum of Natural History. Tours were arranged to look at different disciplines. The scale of the facility is impressive. It includes four storage areas, called pods, each the size of a football field. The height of the pods has allowed mezzanine floors to be added when required and in other areas, high racking was installed to take out-sized palletised items. The pallets were custom-made from aluminium with fabric dust covers. Forklift trucks are used to access the pallets.

Few people seemed to make their way to the Materials Research laborato-

ries, which was unfortunate because it was fascinating to see the depth and range of projects being undertaken. The day was completed with a barbecue. After a day of hot sunny weather, the heavens opened and the slightly wet delegates who braved it outdoors sheltered under an awning, which at times threatened to blow away.

The Conservation committee meeting took place on the Tuesday 29th June. Three topics of relevance to NSCG members were discussed.

A sub-committee is being formed to address the problem of pesticide residues on museum collections. The sub-committee aims to bring together specialists in this field to discuss research progress and to assess further research projects. Contact Vicky Purewal or Judy Birschoff, National Park Service, Division of Conservation, Route 2, Box 251-A, Kernersville, WV 25430 USA or Jessica Johnson on jessica.johnson@nps.gov or at her address National Park Service, Museum Management Program, 1849 C St NW (NC230) Washington, DC 20240 USA.

Paula Work of Cincinnati Museum Centre is responsible for collating any publications that would be relevant to SPNHC. If anybody knows of any recent publications or otherwise please let Paula have the details. You can e-mail her on work3@fuse.net or write to her at Cincinnati Museum Centre, Department of Invertebrate Palaeontology, 1720 Gilbert Avenue, Cincinnati, OH 45202 USA. This would also be useful for the NSCG newsletter, so please send in any information, papers or journals that have any relevance to Natural Sciences.

Gene Hess of Delaware Museum of Natural History is in the process of putting together a vast project encompassing fluid assessments from collection managers around the globe. So far the survey concentrated on mainly US collections, however it would be beneficial if UK collection managers could contribute their data. This survey is being combined with the work conducted by Arnold Suzumoto on lids and fluids. The survey concentrates only on zoological material. If anybody is interested and would like more information contact Gene directly on hessgk@delmnh.org or write to Gene K Hess, Collections Manager, Delaware Museum of Natural History, Dept. of Ornithology, PO Box 3937 Wilmington, DE

19807, USA. Alternatively, contact Arnold Suzumoto on glassman@bishopmuseum.org or write to Bishop Museum, Department of Natural Sciences, 1525 Bernice St., Honolulu, HI 96817 USA.

The technical sessions were held over three days and were grouped in themed and general sessions. The themes were:

- Health & Safety Issues in Collections
- Collecting, Preserving & Accessioning Genetic Resources
- Repatriation

Talks of Interest

Health and Safety

Biological testing for toxic exposures.
Burroughs, G. Edward National Institute for Occupational Safety and Health, 4676 Columbia Pkwy, Cincinnati, OH 45226.

Report on the national institute for occupational safety and health study of health hazards and control technologies in museum and conservation work.
Makos, Kathryn A. Smithsonian Institution, Office of Environmental Management and Safety, 490 L'Enfant Plaza, Room 4202, Washington, DC 20560.

Health hazards in collections: testing for arsenic contamination.
Howe, Shelley, Johnson, Cynthia and Southward, Jude. Denver Museum of Natural History, 2001 Colorado Blvd., Denver, CO 80205-5798, USA.

General

Impacts of NAGPRA: dealing with culturally sensitive material at the Denver Museum of Natural History.
Johnson, Cynthia. Denver Museum of Natural History, 2001 Colorado Blvd., Denver, CO 80205-5798, USA.

Conserving the data in natural history collections: approaches for automatic scanning and digitising. Andersen, Arthur & Chapman, Ralph, E. Virtual Surfaces Inc., 832 E. Rand Rd., Suite 16 Mt. Prospect, IL 60056 USA: ADP, National Museum of Natural History, Smithsonian Institution, Washington, DC 20560-0136 USA.

Conserving the data in natural history collections: using technology to minimise wear and damage on specimens during research.
Chapman, Ralph, E. & Andersen, Arthur ADP, National Museum of Natural History, Smithsonian Institution, Washington, DC 20560-0136 USA. Virtual Surfaces Inc., 832 E. Rand Rd., Suite 16 Mt. Prospect, IL 60056 USA

Storing oversized objects in the department of anthropology: aluminium pallets with open framing.
Evans, Sunae Park and Hansen, Greta. National Museum of Natural History, Smithsonian Institution, Washington, DC 20560-0136 USA.

The concentration shift indicator: a simple instrument to monitor the preservation quality of ethanol preserved specimens.
Van Dam A.J. Leiden Museum of Anatomy, Leiden University Medical Centre, Box 9602, 2300 RC Leiden, Netherlands.

Zoology Issues concerning loan policies for destructive analysis of museum based frozen tissue and DNA samples.
Baker, Robert, Hager, Britney and Monk, Richard. Museum of Texas Tech University and Department of Biological Sciences, Texas Tech University, Lubbock, TX 79409-3191 USA.

A survey of the adhesives and consolidants used by Byrozoan researchers and the implications for Natural Science Collections.
Buttler, Caroline and Spencer Jones, Mary. Dept. of Geology, National Museum and Galleries of Wales, Cardiff, CF1 3NP. Dept. of Zoology, Natural History Museum, Cromwell Road, London, SW7 5BD.

Preserving a giant squid in New York City.
Cordeiro, James R and Hussaini, Bushra. Department of invertebrates, American Museum of Natural History, Central Park West at 79th Street, New York, NY 10024, USA

Collection, storage and preservation of vertebrate genetic resources: a perspective from the Burke museum.
Edwards, Scott V. and Birks, Sharon. Burke Museum of Natural History and Culture, University of Washington, Box 353010, Seattle, WA 98195.

Botany

DNA banking: legal implications and conservation activities.
Fay, Michael. Royal Botanic Gardens, Department of Conservation Genetics, Jodrell Laboratory, Kew, Richmond, Surrey, TW9 3DS.

Digitising, conserving and re-housing a 17th Century plant collection.
Huxley, Robert. Dept. of Botany, Natural History Museum, Cromwell Road, London, SW7 5BD.

The analysis and detection of hazardous pesticide residues present on herbarium material.
Purewal, Victoria. Dept. of Biosyb, National Museum and Galleries of Wales, Cardiff, CF1 3NP.

Geology

Recovering microfossil specimens from deteriorating mounting media
Golden, Julia. University of Iowa, Dept. of Geology, Iowa City, IA 52242, USA.

Planning for the reorganisation, move and integration of two major fossil invertebrate collections.
Wetmore, Karen. Museum of Palaeontology, 1101 Valley Life Sciences Building #4780, University of California, Berkeley, CA 94720-4780, USA.

The general technical sessions had a wide variety of subjects, including a new method to monitor ethanol preserved specimens, recovering speci-

mens from a flood, adhesives, and methods of storing over-sized objects. In one session, there was a series of talks on scanning, digitising & reverse engineering museum specimens. If there is anyone interested in seeing these papers, please contact the author directly, otherwise Caroline or myself should be able to provide the abstracts.

The conference was very well organised and, despite the heat and humidity, Washington DC was an ideal location for a conference involving museum professionals.

Announcements

Register of Natural Science Collections On-Line

Funding from the Museums and Galleries Commission has enabled the FENSCORE (Federation for Natural Sciences Collection Research) Committee to compile a searchable on-line database of natural science collections at **http://www.man.ac.uk/fenscore/**.

There are now more than 15,000 entries, covering most of the UK. This initiative has also been supported by the Manchester Museum.

Insect Pests in Museums

A Two Day Course at the Natural History Museum, London.
14th– 15th March 2000

Course Tutor: David Pinniger
Cost: £100.00 plus V.A.T.

Details from: P.R. Ackery, The Natural History Museum, Cromwell Road, South Kensington, London, SW7 5BD.

Publication Announcement

Managing the Modern Herbarium
An Interdisciplinary Approach

D. A. Metsger and S.C. Byers, Editors Published by SPNHC
Cost: £36.00 approx.

"Managing the Modern Herbarium highlights the significance and value of one of the world s oldest and most basic elements of botanical systematics, the herbarium. The book combines practical guidelines for the proper care of documented collections of preserved plants and fungi with recommendations for their responsible use in modern systematic research. Though focusing on collections of plants and fungi, the book also provides a useful model for other disciplines." SPNHC.

Publication Announcement

Insurance for Conservators

Proceedings from the 1st Conservation Forum Seminar September 1997

Edited by Caroline Bendix, Valentine Walsh and Val Munday

The Conservation Forum is pleased to announce the post prints from the Insurance Seminar are available as of the beginning of September. The cost of the publication will be approximately £10.00 + P. & P.

The post-prints will provide a reference for all insurance issues covered at the conference, including points raised during the question and answer session at the seminar. Written in an easy style, with advice and information from acknowledged experts, this guide will prove an invaluable reference for conservators within both the public and private sectors and for those employing conservators.

Scholarship Announcement

The Anna Plowden Trust

The Trust is able to offer a limited number of bursaries towards tuition fees for the academic year 1999-2000. Funding is also available for mid-career applicants seeking to improve their skills. In the future, the Trust hopes to fund internships and conservation research and welcomes donations to assist with the development of the conservation profession through excellence and scholarship.

For further details contact: Penelope Plowden, The Anna Plowden Trust, 43 Lansdowne Gardens, London, SW8 2EL

Wot No Ten Agents!

Unfortunately due to lack of articles *The Ten Agents of Deterioration 8. Pollution* has had to be postponed. **PLEASE** send in your articles, comments or snippets of information to the Editor.

Apology from the Editor

I would like to take this opportunity to apologise for this issue of the newsletter being a little late, I hope you indulge me this one time. Having taken over the editorship, learnt a DTP package and got to grips with the difficulties of obtaining articles out of people, I now hope my apprenticeship is over and I can get on with the job a little more efficiently.

The next issue is due out in January, please ensure all articles for inclusion are with me by the first week of January.

May we wish you a Merry Christmas and a prosperous New Millennium.

N.S.C.G. Committee Members

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NATURAL SCIENCES CONSERVATION GROUP