

## Editorial

Dear Membership,

In case you haven't visited our website yet, here is the address again;

[www.natsca.org](http://www.natsca.org)

Please do visit it and use it. The 'Forum' section will be coming soon where you can post questions when you are in need of advice or information, and of course the website should keep you up-to-date on all meetings and training courses that are offered. We will be mailing out membership cards soon, which will have a membership number on them that will allow you to access the Forum. We'll explain how to log on and how to post and answer questions in this mailout. If you have anything that you would like to include on the website, perhaps news of a new exhibition at your museum, or a job that is currently being advertised, then please send the details to me and I will include them.

Thanks to Simon Moore for organising the latest training day, this one held in November at Kew Gardens on the care and conservation of botanical collections. There is a write-up from some attendees in this issue of the Newsletter, and in the next issue we hope to bring you both papers from the people who gave sessions at the study day as well as more personal views from those who attended. The next training day will be held in 2006, on biochemistry issues. Please let us know which issues you feel need to be addressed and then we can tailor the course specifically.

The announcement for next year's conference is in this Newsletter too – to be held at World Museum Liverpool, April 27-28 2006. The theme is Selling Natural Science: Developing concepts and ideas for galleries and other public resources. Any suggestions or offers for presentations at this stage contact Jo Hatton ([jhatton@horniman.ac.uk](mailto:jhatton@horniman.ac.uk)), but a more detailed programme and booking forms will be circulated in the next few months.

Watch this space for news and events in a museum near you – Send me information about new exhibitions and learning developments and we can pass this along to the membership. If you are going to a meeting, why not let us know about it and we'll mention it in the Newsletter, and maybe you'd like to send in a few words about it, so that others can benefit as well. This section is very casual, so don't think you'll have to spend days writing a paper! Please just send us in your impressions so we can pass them along. This way, we are all kept informed about what's going on, and we can all support and encourage each other when the times are bad, and congratulate each other, and ourselves when times are good!

Have a very merry Christmas!

- Victoria Papworth

### ***Contributions for Issue 8, March 2006***

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 March 1st:  
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**Teaching through objects: a user's perspective**  
**- Joe Cain, Senior Lecturer in History and Philosophy of Biology,  
University College London**

This paper began as a curator's question: how can a museum increase the use of collections in teaching? In an important way, I'm not the best person to ask this question. I'm too keen. I *want* to bring collections into my classes, and I *want* to take my students into museums. This question provoked some reflections on the processes we tutors go through while making curriculum decisions. What barriers prevent more use of collections? What causes these decisions to turn one way rather than another?

Make no mistake: the use of object-based learning (OBL) in teaching is hard work. Undergraduate tutors who want to introduce OBL will face obstructions. This is true especially in the humanities – my domain – where demonstrations and laboratories are the exception rather than the rule.

Again and again I came back to three types of barriers as especially important: competition, logistics, and pedagogy. In this paper, I describe each type, then offer some ways to decrease their importance. Museums promoting OBL should take these barriers seriously if they want substantial uptake for any new OBL initiative.

**avoid the deficit approach**

First, a warning.

The most familiar strategy for increasing interest in OBL and museum collections is the broadside: mass distributions of information, loud calls for participation, invitations spread far and wide.

Such strategies rely on a "deficit" model for communication: we assume the audience has a knowledge deficit and we assume this is best remedied by providing more information. The deficit model is frequently expressed with declarations such as, "we just need to get our message out," or "let's circulate our catalogue to all interested parties," or "what about an all-staff e-mail?"

The deficit model fails to increase involvement because it wrongly assumes the problem was a lack of knowledge. Moreover, the linear process it presents as communication (sender to transmitter to receiver) is, in reality, a monologue. It offers no way for the sender to gauge reaction, assess need, or monitor interest. Neither does it allow the receiver to customise information for their own purposes (Gregory and Miller, 1998). Simply talking more, or simply talking louder, seems to have little effect on most users' knowledge, understanding, or level of engagement. This explains why broadsides are a poor strategy for expanding OBL and the use of collections.

More effective models of communication stress dialogue and engagement. Communicators must understand a user's goals and appreciate their particular styles for learning. The key idea is empathy: see the problem from the user's point of view. A user's perspective on the expansion of OBL and the use of collections should begin with a study of barriers inhibiting participation. What prevents a tutor from adopting OBL? Assuming they already have some idea of a collection's inventory, three types of barriers jump into the foreground.

**barrier 1: competition**

Know the competition.

Competition is stiff in today's audio-visually complex undergraduate classrooms. When I design an OBL exercise, museum objects are only some of the options I have at my disposal. Before I chose to work with them, I consider other options:

- mental pictures I can paint through oratory
- objects I can provide myself
- images I can project in the classroom

For my purposes, these can function as objects in OBL sessions. In fact, these are my first ports-of-call, especially as I now have reliable access to data projectors. This means I can draw from the hi-quality colour

images and video sitting in my laptop. Such resources are serious competition to any museum collection, and choices for OBL are made accordingly.

A decisive factor in this competition is simplicity. I need information, examples, and demonstrations to be clear, clear quickly, and easy to supply. Often I work at short notice, from tie-ins I choose the day before. In addition, most of my choices about objects for OBL exercises use a *sufficiency* criterion: objects need not be ideally suited; they simply need to be *good enough*. The key point is competition. Even after I adopt an OBL approach, I'm not committed to using museum collections. Many factors influence my choices as to which objects I use and how I structure those OBL exercises.

### **barrier 2: logistics**

Logistical concerns form a second type of barrier to expanding OBL and use of collections. All tutors are familiar with lecture scenes where nothing seems to work, people fiddle with the technology, no one can see what they're told to see, there's no way to backtrack, and so on. No one wants to repeat these themselves. Moreover, we're under considerable pressure to complete certain learning objectives. This pressure discourages risk taking. For us to see OBL as a viable alternative, tutors have to be sure it will work smoothly.

Imagine a simple demonstration showing some early microscopes. My purpose might be to ensure students see, literally see, organic material using equipment comparable to 18thC technology. Before agreeing to add such a demonstration in my course, I'll want various logistical issues solved. These include:

1. time – can I ensure the material is delivered, set up, and removed in the tight window of my assigned timetable (normally, 50 minutes  $\pm$  5 minute intervals before and after).
2. access – everyone in the session must be able to participate in the activity and move around the room. For me, that's normally 20-30 students. Can this be done in the time available? What are the other students going to do when they're not using the microscopes?
3. background knowledge – when am I going to prepare students for this activity? Do they know I want them to see the microscopes as technology, to compare the objects on view, to think about the relation between observations and conclusions (“seeing” vs. “seeing as”)?
4. distractions – how do I balance the need to focus student attention on my objectives vs. encourage an open-ended experience?
5. shut off – when my objective is achieved, the job's done and I'll want to move on. I need effective transitions.
6. recording – what records preserve the student experiences? What note-taking needs to be done? Students need to be able to recall and reflect on the activity both for their own purposes and for revision.
7. supplements and alternatives – what am I providing for students who miss this activity? What happens when students want to know more?
8. backup – taking risks is easier if I know I have a back-up: e.g., when students can return to study a permanent display; or, when I can substitute a reading.

University tutors worry about such logistical concerns because, as a group, we're poorly trained for activities outside chalk-and-talk methods for delivery. We're certainly less experienced compared with primary and secondary school teachers. Any one of these logistical concerns can skewer an OBL exercise. The fear this might happen creates an important barrier to risk taking via OBL projects.

In addition, tutors need to be convinced OBL offers high value-for-effort. Count this in two ways. Time spent on an exercise not only must relate *in fact* to course objectives. It also must *be seen to relate by the students* to those objectives. It's not that I'm tied to a culture of teaching simply for examinations. In fact, I normally find students remarkably willing to follow my lead. But they'll do this only when they're confident I'm not wasting *their* time and when the tasks I set seem eventually and somehow to relate to the course's learning objectives. If they trust me, I have considerable latitude.

Trust cannot be stressed strongly enough. The effectiveness of alternative teaching techniques relies on it. Anyone proposing OBL activities to me needs to keep it in mind. I won't risk losing the students' trust unless I'm confident activities will flow roughly as planned. The last thing I need in a teaching technique is a way to lose something like the trust I've worked hard to build. That'll leave me with more problems than solutions, and it'll stop me from using this option again.

Are logistical concerns so large a barrier? Many museums have staff well-trained to solve logistical concerns such as the problems I describe. Well-rehearsed routines support visitors like me and my groups. However, university tutors new to OBL and museum roles likely won't know this. Liaison here is crucial. Show us you've anticipated our needs, and you'll earn our trust.

Again, the point is simple: logistical barriers, real and imagined) restrict the expansion of OBL, especially with collections and within museum spaces. Some of these concerns grow simply from inexperience on the tutor's part. Tutors need someone to help them work through these concerns. The easier the solution, the better. Remember, competition is intense. While I might agree, in the microscope example, that peering firsthand through lenses is ideal, I'll quickly settle for an alternative, such as a few photographs or a video clip. It won't be perfect, but it'll accomplish my objectives in the short time I have available to accomplish them.

### **barrier 3: different learning**

OBL asks tutors a great deal more than the occasional demonstration and tour. Indeed, its very appeal comes from the fact OBL can promote learning in ways vastly superior to what's found in a typical university lecture. Those advantages are easy to identify.

OBL promotes active, student-centered learning, which a considerable literature advocates for drawing students into high-level and deeper cognitive processes (Hein 1999). Hooper-Greenhill (1994: 145) relates activity to recall rates after learning: use of interactive exhibits and handling or talking about objects promotes recall rates as high as 90% compared with reading (10%), hearing (20%), and watching (30%). More significantly, Biggs (2003) argues pedagogy emphasizing active learning has considerable value for widening participation, as active learning reduces the impact of differences in preparation for academically and non-academically committed students. It also is a centerpiece in constructivist learning strategies.

Jeffrey (2000) defends active OBL for promoting different types of cognitive gains: factual knowledge, conceptual knowledge, process knowledge, curiosity, heuristics, and affective leaning. This helps explain why OBL has a long history within museum communities. Hooper-Greenhill (1994) argues OBL provides important opportunities for conveying symbolic meanings and promoting empathy, for stimulating imagination, and for assisting students in placing themselves within larger communities of understanding. McLaughlin (1998) stresses the importance of multi-sensory experiences, which OBL provides, for developing the emotive associations underpinning not only reflection and synthesis but also cultural memory. Furthermore, OBL can be a strategy for developing student abilities across the seven "intelligences" distinguished by Gardner (1983): linguistic, logical-mathematical, spatial, musical, kinesthetic, inter-personal, and intra-personal.

OBL is used widely to develop perceptual and observational skills. It also is a flexible teaching tool, with value easily added. For example, it can be coupled with collaborative learning and reporting. Alternatively, it can encourage self-directed learning. This is recognized as a key preliminary for informal and life-long learning.

Turn these advantages around and the third type of barrier presents itself. Simply put, OBL demands tutors teach in a way that's different from the familiar techniques of most university lectures.

When museums promote OBL with their collections, collections are only half the item actually being promoted. They also ask me to learn OBL. Don't forget, for most tutors OBL is a radical change in their approach to teaching. Expect some to be malleable, even eager. But don't overlook the magnitude of this suggestion for others. Some tutors argue students can't learn when they're talking. Others hate interruptions for questions. Others set goals to deliver a fixed amount of factual information. If that quota is not met by the end of a lecture, they panic for fear nothing will be covered for regurgitation on the exam.

OBL asks for pedagogical skills some tutors simply don't have. It's like selling cars to people who don't

know how to drive. The point is so obvious it often is missed: OBL arrives in a tutor's life as a *pair* of ideas: something about objects and something about learning. Ignoring the other half of this combination means you minimise the impact of any OBL initiative you care to launch in higher education. Each of these three barriers suggests opportunities to exploit for those proposing OBL to tutors. I'll consider several for each.

### **opportunities 1: competition**

A picture can be worth a thousand words.

Supplying images for classroom use can be as valuable in OBL as offering objects themselves, demonstrations, or gallery visits. While images aren't always ideal, they're good enough for many purposes. When I use images, I can avoid many of the logistical problems mentioned above. Moreover, I can deliberately choose images from a specific collection when I want to promote that collection for other uses, such as informal learning.

Think about pairing *images* and OBL as much as you think about pairing *objects* and OBL. I acknowledge concerns associated with IPR. But, we can find easy solutions past this impediment. Watermarks, increasingly used by digital archives, seem a good compromise.

A more important downside for museums probably involves visitor statistics. With images, I'm still "using" a collection and basing my learning firmly around its objects, but any census of visitation is likely to miss this. Hence, the museum loses evidence of an active, sometimes substantial, audience. No problem is insurmountable. Might we create more realistic criteria for counting "use"? On the tutor's side, I acknowledge we users need to be more vocal about the value we place on a museum's efforts and resources. In fact, because so many tutors think it's clever to use these sorts of things in teaching, simply asking us about use surely will elicit no end of gratitude. That'll come in handy when you report visitor statistics.

### **opportunities 2: logistics**

Logistical barriers often are site-specific, hence there is little general to say about them. Other than reiterating the need for smoothly running operations, one suggestion will do. It involves packaging.

Think how resources are packaged for use. Options preferred by users may not match the packages museums normally offer. Or, more likely, tutors simply need to be reminded about the options available for use. A 5-minute show-and-tell involves a much different kind of commitment for a tutor compared with a 60-minute hands-on activity or a half-day visit to a gallery. Focused and compact packages are easily integrated into the rigid lecture schedules I am forced to use.

Some of the packages convenient for me certainly will be beyond a museum's capacity to deliver. If I can't fit a gallery visit into my lecture schedule, then you might suggest ways I could imbed collections into coursework. How do I turn a gallery visit into an essay assignment? I don't always need objects to be physically present in the lecture hall for them to be part of an OBL exercise. In lecture, I need only encourage visits and draw connections. Constructing a reason for a visit will accomplish OBL goals while also avoiding the logistical problems we both want to avoid.

### **opportunities 3: pedagogy**

Two ideas suggest solutions to some of the pedagogical barriers to collections-based OBL. The first is a light-hearted idea with a serious point.

There are times when tutors express frustration with how *little* an impact they seem to make in their courses. Use those moments to pounce. "Regurgitation doesn't have to be the only learning objective," you might explain to me during such a moment. "Other kinds of learning can occur in teaching sessions." For instance, you might remind me:

1. students respond to breaks in routine: I should get them out of the classroom.
2. universities are research institutions; much more than classrooms and computer clusters; I should remind students of this.
3. institutions are repositories of knowledge and culture; curiosity can be encouraged with open-

ended exploration. This will improve a student's sense of personal ownership in their knowledge.

4. learning shouldn't be focused solely on exams. Then again, neither should teaching.

A much less direct approach offers a second route to exploiting the problem of pedagogical barriers. Tutors receive an endless stream of suggestions for additional resources: new textbooks, new on-line resources, more information, and so on. Don't simply add one more with an announcement of available resources. That certainly will be lost in the crush.

Instead, embed OBL into the processes tutors undergo when building curriculum and improving their pedagogical skills. For instance, most universities now have tutor-training programmes as part of their quality assurance work. Try to embed OBL, and OBL using specific museum materials, into those programmes. OBL is a natural partner with group work and student-centred learning, for instance. Use those training courses as a start by ensure your collections become the standard examples and case studies used in the training. Or, offer training courses yourself, such as on "OBL using local resources," or "teaching in non-traditional spaces." This embedding integrates your collections into the systems tutors use (sometimes they are required to use these systems) for training and innovation. This is where long-term, programme-level impacts will come.

On a more mercenary line, seek out departments due for audits of their teaching quality. Point out, for instance, the ties between OBL and the QAA benchmarks most disciplines use in these audits. For instance, OBL can provide core and transferable skills across a wide range of disciplines – e.g., appreciating the complexity and diversity of events and mentalities (QAA benchmark for history), critical engagement and reflection (philosophy), interpreting data and its variation or relating theory to practice (mathematics), promoting imaginative reflection and appreciation of context (English), appreciating changes in temporal and spatial scales (Earth sciences), appreciating the skills and practices of past practitioners as well as their roles in producing, interpreting and making use of knowledge (history of science, technology, and medicine). Develop these ties, and you'll be thanked for solving two problems in one stroke.

The key idea is to shift your marketing from cold-calling to embedding. Train your users in the skills they'll need when teaching with objects, and do it with the materials you want to make available. Teach me to drive; then, sell me the car. Teach me to drive in *your* car, and my preference for it will seem natural. Marketing agencies use this strategy all the time. Why do you think so many computer and software companies offer such large educational discounts?

### **conclusion**

Three key points rise from this analysis.

First, abandon the deficit model for communication. Mere broadcasting won't have much impact. What's likely to help most is a focus on the problem from the user's perspective. Design your thinking around questions such as what barriers prevent tutors from using OBL in general or using OBL with specific collections?

Second, adopting a user's perspective will remind you some barriers have nothing to do with museums or the objects themselves. Teaching through objects is hard work. Stiff competition points users in other directions. Logistical concerns can overwhelm tutors, especially the inexperienced ones. OBL also asks a lot of tutors. For some, it asks more than they're willing to give. It arrives in most tutors' lives as a combination: new objects *plus* new styles of teaching. If collections aren't presented as part of that package, they'll be received as only half a solution.

Finally, I write as a user. Let me speak for them by sharing the excitement museum staff have for OBL. It's a fabulous teaching tool. It makes learning a joy, and it can inspire students when all else fails. Everyone remembers a moment when they learned something new in a museum. Tutors like me are grateful for the work museums do, and we support those efforts 110 percent.

### **bibliography**

- Biggs, John. 2003. *Teaching for Quality Learning at University*. Second edition (Buckingham: Open University Press), 309 pp.  
 Gardner, Howard. 1983. *Frames of mind : the theory of multiple intelligences* (London: Heinemann), 438 pp.  
 Gregory, Jane and Steve Miller. 1998. *Science in public: communication, culture and credibility* (New York: Plenum), 294 pp.  
 Hein, George. 1999. *Learning in the museum* (London: Routledge), 203 pp.

Hooper-Greenhill, Eileen. 1994. *Museums and their visitors* (London: Routledge), 206 pp.  
 Jeffrey, Kodi. 2000. Constructivism in museums: how museums create meaningful learning experiences, pp. 212-221 in Hirsch, Joanne and Silverman, Lois (eds.). 2000. *Transforming practice* (Washington, DC: Museum Education Roundtable), 346 pp.  
 McLaughlin, Hooley. 1998. The pursuit of memory: museums and the denial of the fulfilling sensory experience. *Journal of museum education* 23 (3): 10-12.

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Figure 1: Philosophy of biology students discuss “progress” and “species” concepts in the Grant Museum of Zoology and Comparative Anatomy, University College London.



Figure 2: A picture is worth a thousand words. I don't need to take students to museums myself if I use photographs to train their eyes. They can visit collections on their own time. The Pitt Rivers Museum, Oxford.

## **Japanese Tissues; Uses in Repairing Natural Science Specimens** **- Simon Moore, Natural Sciences Conservator**

### Abstract

Japanese tissues are widely used by conservators, especially those who work with paper. Until recently their use had not been applied to Natural Sciences. This article shows how they can be used to create tidy and effectively strong repairs and gap fills for the repair of taxidermy specimens.

### Introduction

There are three principal plants used in the manufacture of Japanese tissues: *Kozo*, *Mitsumata* and *Gampi*. These plants are grown, harvested and processed in small villages in certain provinces (e.g. Nara) after which the tissues are named. Purposeful additives (such as powdered shell and clay) are also listed resulting in some lengthy compound names for these tissues! The fibres in the bark are exceptionally long and strong which gives the tissues their characteristic strength.

The pulp from these plants is skilfully agitated and laid, using the finest of purpose-made wicker baskets, aligning as much of the fibre as possible and creating tissues of varying grades and weights (in grams per square metre). Since the plant fibres are mostly in alignment (Fig. 1a), thanks to the basket-layering process, the strength of the paper is amazing. The critical tearing mass (breaking strain across the grain) of a 1 cm wide length of 9 gsm Gampi (one of the thinnest papers) is an amazing 2.015 kilograms! The paper can also be torn by hand in a perfectly straight line along the grain.

These handmade papers are produced by a traditional craft industry after centuries of amelioration (some papers exist that are 1200 years old!). Unfortunately that the next generation are less interested in such tradition. The craft is gradually being subsumed by mass production of inferior tissues from Thailand and the Philippines, which do not possess the same physical properties as the more expensive but superior hand-laid papers. Holding a sheet of poorer quality paper up to the light reveals undesirable knots of fibres, unwanted particles of plant material and a poorly aligned grain structure (Fig. 1b). Although a single large sheet of traditionally made paper (1400 x 915mm) can cost £16 a great many repairs can be made using the one sheet combined with its strength and purity.

Used extensively in paper conservation for their combination of fineness and strength, these tissues also have found many applications in natural science specimen conservation.

Figures 1a-d. Samples of Japanese and other tissues magnified x 360 to show the more correct alignment of fibres in the traditional tissues opposed to the random grains structure of mass-produced tissue.

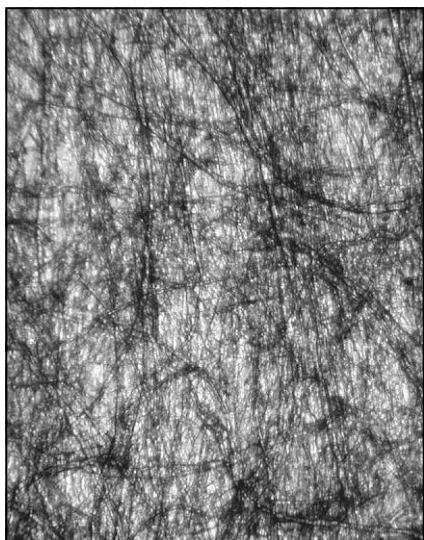


Figure 1a: 9 gsm traditional Gampi

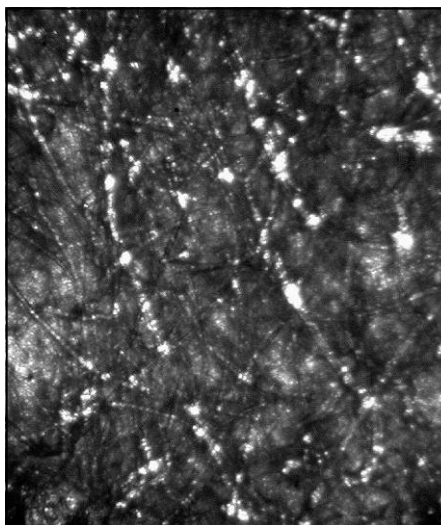


Figure 1b: 'silk tissue' 10 gsm sulphite-free



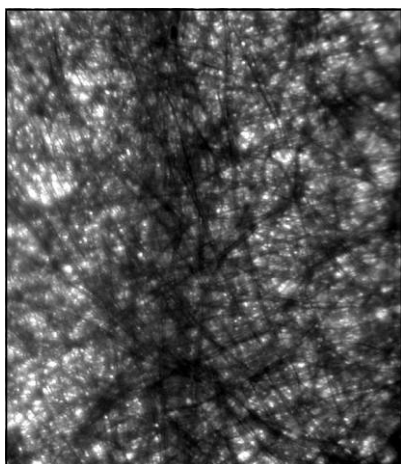


Figure 1c: 15 gsm traditional Kozo

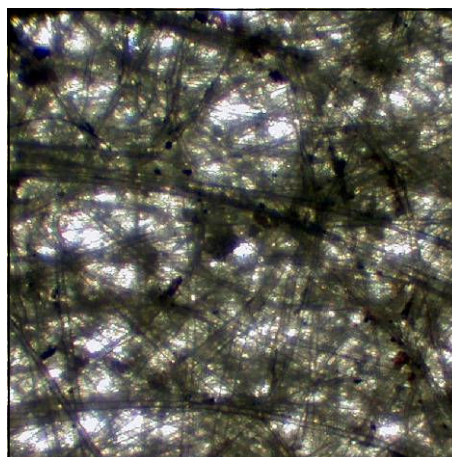


Figure 1d: 14 gsm Philippine Gampi

### How the process works

A strong tissue, whose structure does not break down into a tangle of fibres when wet or in contact with an aqueous adhesive, is ideal for many types of repair work. The tissue acts as a stable bridge between the protein/amino acid or cellulose-based structures of animal or plant tissues and the associated adhesive has to penetrate deeply into the tissue and have a neutral pH. Neutral pH PVA is widely used in this context and bonds strongly with the micro-fibrous surface of the tissue.

Japanese tissue can also be used as a gap-fill: either as a simple surface cover that can be textured with a sharp point before painting, or as a deeper level fill (no more than 3mm for each layer or the whole becomes difficult to manage). The latter fill is similar to *papier-mâché* but has a harder finish.

### Applications

So far I have found Japanese tissues to be useful for:

- 1 Rebuilding pest-shredded bird feathers
- 2 Re-mounting detached bird feathers.
- 3 Rebuilding fish mount fins that have been holed or eaten away by pests or have split due to prolonged low relative humidity.
- 4 Repair of lepidopteran wings. (All of the above due to the depredations of *Anthrenus* and other insect pest larvae.)
- 5 Textured gap fills for webbed feet, bird legs and mammal tails.
- 6 Repair of damaged mollusc shells.

It is also being tested for the repair of Botanical herbarium specimens but this area is presently incomplete.

### **Surface gap-fills**

The strips of tissue must be torn so that the edges will blend into the background - cut edges remain noticeable, even when painted.

### **Textured gap-fills**

These require pre-gluing of the tissue so that it can be folded in on itself. The plug is then inserted, shaped and the surface moistened with neutral pH PVA. The surface can then be deckled or textured using a pointed spatula until the desired effect is achieved (Fig. 5c). Various types and gsm grades of tissue can be used for this work depending on the area to be covered and the type of animal tissue. Always experiment with a small piece of tissue first if unsure, the process is always reversible.

**1-2 Bird feather** repair and re-building obviously requires time and patience and is only carried out on specimens of great rarity or importance.

1. Barbs need to be graded, using a low-power microscope and kept in a draught free (lidded) container.

2. The barbs are then individually glued, using a tiny amount of 50% PVA onto the strip of low gsm Gampi (9 gsm is best). The glue is applied using an eyelash glued onto a small glass rod. Ensure that the tissue is partly placed under a strip of 2-3mm glass to prevent it from curling as it comes into contact with the water-based adhesive. Should the barbs adhere to the glass, the adhesion can be broken using a wedge-shaped scalpel blade (Swann-Morton No. 25 is best).
3. After c. 15 minutes the next barb can be glued.
4. Before replacement, the re-built feather may lie rather flat. Brushing a small amount of deionised water onto the back of the tissue will help the feather regain its natural curvature.
5. Once the feather has been rebuilt, the shaft base is wrapped in some tissue with PVA to increase the surface area of adhesion. Shaft bases are often brittle and this obviates recurrence of feather drop. Where the skin has been eaten away by *Anthrenus* larvae, Japanese tissue can be used as a replacement skin with feathers added to it in swatches.

### Tips

If repairs are going to be visible, ensure that all strips of tissue are torn and not cut. Straight (cut) edges can still be seen even if subsequently painted.

Heavier weights of tissue can be used for stronger joins but will need to be well moistened with adhesive.

Heavier tissues are also useful for internal repairs.

**Note Lighter** tissues will start to curl as soon as they become moist – if this effect is undesirable ensure that at least part of the tissue is held flat under a small sheet of glass. Bear in mind that lighter weight tissues will follow the natural curvature of a feather.

Figures 2a-c. Damaged feathers can be mounted barb-by-barb onto 9 gsm Gampi tissue strips.



Holes can be repaired with strips of Gampi tissue. Shafts can be tissue wrapped to give extra surface area adhesion.

**3 Repairing fish mount fins**

Fish fins provide an easy feast for pest larvae resulting in unsightly holes. If the relative humidity level of storage or display areas falls below 45% then fins and skin can start to split or crack. Japanese tissue provides a suitable medium for gap-filling.

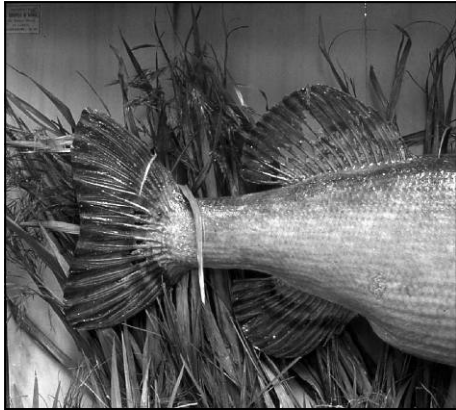


Figure 3a: Pike specimen with fins and tail holed by *Anthrenus* larvae



Figure 3b: 14 gsm Kozo tissue is applied in torn strips and glued onto rear side of fins

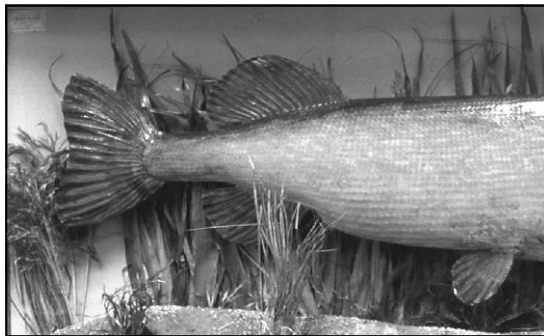


Figure 3c: Tissue in-fills are then painted and when dry are shellac lacquered

**4 Lepidopteran wings**

Stored and displayed insect specimens are also prone to pest ingress and ensuing damage.

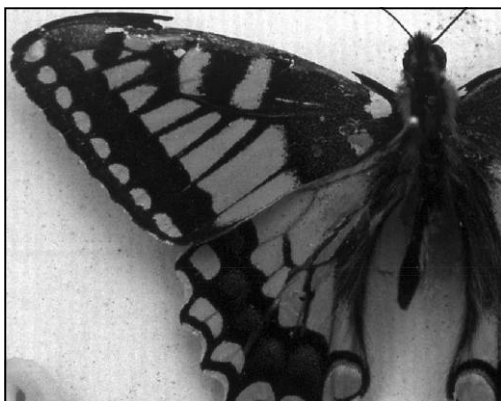


Figure 4: 9 gsm Gampi tissue provides a lightweight and strong enough backing, for painting into damaged display specimens

**5 Textured gap-fills** require some pre-gluing to the tissue so that it can be folded in on itself. The folded plug of tissue is then inserted, shaped and the surface moistened with neutral pH PVA. After about 20 minutes the surface can be deckled or textured using a pointed spatula until the desired effect is achieved. Various types and gsm grades of tissue can be used for this work depending on the area to be covered and the type of animal tissue. Always experiment with a small piece of tissue first if unsure, the process is always reversible.



Figure 5a: Broken bone of little grebe re-aligned and glued into place



Figure 5b: Glue-impregnated tissue tucked into place.



Figure 5c: Tissue gap-fill deckled with a spatula point

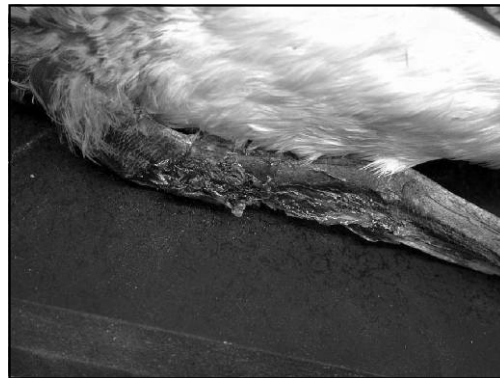


Figure 5d: Dried, coloured gap-fill textured using a sharp point



Figure 5e: Gap-fill coated with shellac lacquer. point

**6 Repairing mollusc shells**

The tissue acts as a bridge between the thin edges of the shell and forms a reinforcing plate internally so that a ‘Paper Argonaut’ shell can be more safely handled. Heavier tissues are also useful for internal repairs.

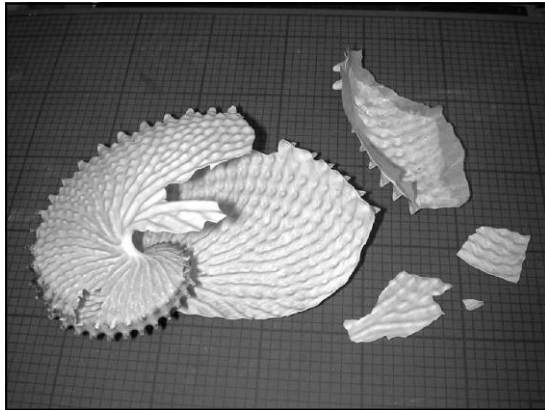
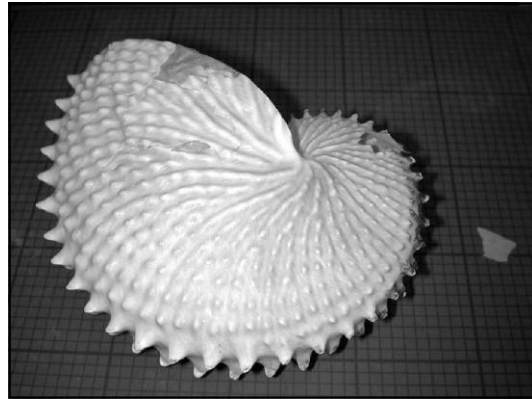


Figure 6a: Broken paper Argonaut shell repaired using 9 gsm Gampi tissue



**Dry tissue strength table**  
Figure 6b: The repair is so strong that the shell is now used as a handling specimen

<u>Tissue type</u>	<u>weight (gsm)</u>	<u>breaking strain (g)</u>
Acid-free wrapping	9.85	346
Gampi (traditional)	9	2015
Gampi (sulphite-free)	10	1845
Gampi (traditional)	14	2544
Philippine Gampi	20	2620
Sekishi Kozo	15	4580
Kozo	12.25	5705
Usumino Kozo	8.5	3960

Conclusions

Japanese tissue has been found to be an effective medium to support and strengthen adhesive to protein joints for deteriorated taxidermy and similar applications for other natural science specimens. The range of weights and tissue types will help to increase their versatility in natural science conservation repair work.

## Problems with lipid and fluid-preserved specimens - Simon Moore, Natural Sciences Conservator

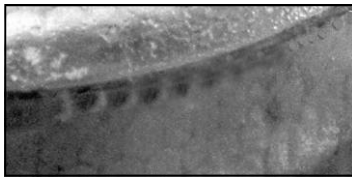
### *Abstract*

Are the fluids preserving your natural history specimens looking rather yellow? Does your Damien Hirst shark or lamb look a bit 'off colour'? The problem with fluid-preserving zoological specimens, particularly vertebrates, is that they still contain lipid which cannot be fixed. This paper outlines this problem and suggests preventive measures.

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Lipids are well-known to us as the building blocks of all that unwanted subcutaneous fat which can disfigure our bodies. What we may not realise is that lipid is essential in our bodies for maintaining a healthy metabolic balance. The same applies to all other animals especially such vertebrates as marine mammals and fish, even more, elasmobranch fish such as sharks and rays who store large amounts of lipids in their livers.

The problems usually arise from ignorance - many assume that formalin is a universal fixative. Carter (2001) has outlined how formaldehyde cross-links with the amine and amide side-groups of proteins, causing cross-linkage that renders them more 'stable' and resistant to bacterial breakdown. Although fat-containing cells or lipocytes are actually fixed by formaldehyde, their contents (lipids) are not. The lipid gradually osmose through the lipocyte membrane and pervades the formaldehyde solution turning it a pale yellow (initially).



Globules of lipid in formalin extruded subcutaneously from a preserved snake specimen

Since the lipid is less dense than the preserving fluid, it floats to the top forming small globules. In contact with air the lipids gradually oxidise and take on a deeper colour, darkening the fluid to orange. As more lipids escape from their lipocytes, the floating globules coalesce into greasy floating masses. As these continue to oxidise, they release fatty acids into the preservative, lowering the pH. When the pH drops to below 5.5, the process becomes accelerated, also bringing about skeletal decalcification and tissue denaturation.



Stoa preserved in alcohol that was formerly severely contaminated with lipid which subsequently oxidised and decalcified the stoa's skeleton. The stoa now stays in this 'concertina' position!

Collection managers frequently come to me asking why in c. 1977 were they asked to reduce their levels of formaldehyde in collections by converting to post-fixation preservatives such as Steedman PFP, (more recently) Opresol or one of the other phenoxetol/ 2-phenoxyethanol-based preservatives. I have already written about slow penetration of aqueous fixing/preserving solutions and how that densely-muscled fish will gradually decay in these solutions, which were originally designed for fixing and preserving zooplankton (Steedman, 1976) – a rather different kettle of fish if you'll excuse the pun (Moore, 1997, 2001b).

Many collections are now reverting to alcohol as a preservative but having to take on board the problems of fire risk and evaporation, leading to fungal infestation (Moore, 2005), this is creating a different rod-for-back situation. Although alcohol will dissolve lipid it can still become saturated, leading to serious contamination problems associated with lowering of pH and tissue breakdown.

### Preventive measures

Lipid-bearing organs such as fish liver, should either be removed or the specimens should be prepared over a longer-term allowing the lipid to escape and be removed until it no longer is a problem but this can take several years. Transferring to alcohol to dissolve out lipids can accelerate the process but the specimens must be carefully transferred to alcohol (Moore 2001a) and then transferred back to formalin or a suitable preservative. This especially applies to display specimens and works of art or else an annual check and replacement of preserving fluid must be carried out.

### Test

Preservative solutions can be tested for lipid content by pipetting a small amount into a Petri dish of water on a black background: the turbidity level caused by the dissolved lipid can be seen as a white cloud around the pipette.

Lipid-saturated IMS squirted into a Petri dish of water showing the resulting white emulsion clouds of lipid contamination



### Conclusion

As usual the main problem for lipid contamination is down to ignorance or short-cutting. I can only hope that specimen preparators will bear this in mind, whether the specimens are destined for museum collections and displays or sold as works of organic art. They have to be properly treated during the preparation stage and again at the moment when escaping lipids are saturating the preservative fluid. If your specimens are deteriorating by this or any other means, they can be saved, staff can also be trained. Contact the website below for help and advice.

[www.natural-history-conservation.com](http://www.natural-history-conservation.com)

### References

- Carter, J. Fixation an overview. *Natural Sciences Conservation Group Newsletter*, **18**: 27-232. 2001.  
Moore, S.J. Phenoxetol, Friend or Foe? *Natural Sciences Conservation Group Newsletter*, **6**: 44-45. 1997.  
Moore, S.J. Transferring specimens from formalin to alcohol. *Natural Sciences Conservation Group Newsletter*, **17**: 43-45. 2001 (a).  
Moore, S.J. Histological effects of fixation. Are preservatives beneficial or not? *Natural Sciences Conservation Group Newsletter*, **18**: 24-26. 2001 (b).  
Steedman, H.F. *Zooplankton fixation and preservation*. UNESCO Press, Paris, 1976.

## Macedonian Magic - Adrian Norris

In late March 2005 my wife Barbara and I visited Skopje, the capital city of Macedonia as part of various on-going projects she is undertaking to help museums in the former Eastern block.

Although a major earthquake devastated the main town of Skopje on the 26<sup>th</sup> of July 1963, it is interesting to note that the old town suffered relatively little major structural damage. Much of the town centre has since been redeveloped, but with the demolition of so much of the main town this left the city authorities with the opportunity to include within the redevelopment large areas of open space. A large area surrounding the ancient stone bridge over the River Vardar, which links the modern town centre with the old town, (also known as The Old Bazaar), and a stretch along its South bank is now an area of open spaces for cafés, concerts and other leisure activities.

The magic that is Macedonia started on our first evening in Skopje when we were entertained by an open-air concert by Irish entertainer and Eurovision Song Contest Winner, Johnny Logan, the stage for which had been set up in the square just outside our hotel.

Whilst my wife was working on a project for the Museum of Macedonia, I was invited by Ivan Dodovski, the Program Director for Culture & Communication of the Open Society Institute, Macedonia, a division of the Soros Foundation, to give two public lectures at the Macedonian Museum of Natural History in Skopje. Museum staff, government employees and the public attended these, with simultaneous translation being available. The lectures were based around the subject of Natural History Museums in the Modern World.

This invitation gave me the opportunity to visit the museum and talk to the director, Mr Klime Korobar, and his staff. This process was greatly helped firstly by Zoran Nikolov, an English-speaking museum guide, who guided me around the public displays as well as introducing me to various members of staff, and my official translator Maja, appointed by the Open Society Institute.

Dr Stanko Karaman founded the Macedonian Museum of Natural History in 1926 when he established through an official act, a Zoological Museum that then included a zoological collection in the city park, which is now run separately by the city authorities. The Zoology Museum, as established at that time, came under the auspices of the Museum of Southern Serbia. The Museum moved home several times over the years but the earthquake of 1963 badly damaged the building then housing the museum and its stored collections, and thus had to be demolished. The present building was constructed in 1969.



Macedonian Museum of Natural History

The Natural History displays are of good quality, even if a bit traditional, but it was interesting to see how they have been able to cover most of the major subject areas using only material collected from within the country's own relatively small political boundaries. This reminded me very much of the many local museums in Britain whose collecting is now restricted to material from within their own political boundaries. However, in most cases in Britain, the natural history displays are supported by material from outside these defined areas.

As indicated above the natural history museum, like all of the National Museums in Macedonia, restricts the content of its collections to material originating from Macedonia. The geopolitical landscape of the region has changed many times over the past hundred years or so, and is now very different from the geographical area known as Macedonia, a large part of which is now in Northern Greece. Prior to 1913 Macedonia was part of the Ottoman Empire and was thus ruled by the Turks, but after the first Balkan War, which started in October 1912 in which Montenegro, Serbia, Bulgaria and Greece took an active part in driving the Turks out of the Balkans, things changed drastically. In 1913, after the Turks had left, the area was partitioned and



a large part, Aegean Macedonia, was renamed Northern Greece, Bulgaria annexed Pirin Macedonia whilst Serbia took over Vardar Macedonia and renamed it Southern Serbia. After World War II the area then known as Southern Serbia, now mostly the present state of Macedonia, became a constituent republic of Yugoslavia under President Tito. After Tito's death nationalist pressures culminated in Macedonia declaring independence in December 1991.

The 1963 earthquake and the more recent troubles in the Balkans have left the staff feeling very isolated from the rest of the world. There are little or no funds to purchase the various publications they require, and little possibility of them travelling to meetings outside the region. I was asked on several occasions if I could try and arrange for overseas visitors to come to visit them, perhaps by organising an international conference, or help to arrange study tour, which could include a field trip and thus include visits to other areas, including the World Heritage Site of Lake Ohrid. I would be interested to know if any of our members would be interested in taking part in such a trip.

**Request for Information.**

The staff of the museum also asked me if I could help with locating material held in British Museums which originated from within the present boundaries of Macedonia. They are particularly interested in records of birds, but would like information and records on all groups of animals and plants to help them establish a fuller database of the flora and fauna of their country. It would also be very interesting to know how much material is held in British Institutes from the World Heritage Site of Lake Ohrid.

If you have any information, or would like to visit Skopje and Macedonia please contact me at the following address: Mr Adrian Norris, 17, West Park Drive, Leeds, LS16 5BL  
E-mail [AdrianXNorris@aol.com](mailto:AdrianXNorris@aol.com)



Permanent Bird Display



Permanent Geological Displays



Permanent Palaeontology Display



Permanent Botany Display

**NATSCA Seminar at RBG Kew 17<sup>th</sup> November, 2005**  
**- John Hunnex, Andrea Hallaway, Felipe Dominguez-Santana,**  
**Herbarium Technicians, NHM**

### **Introduction**

This is the fourth NatSCA seminar (Geology, Fluid-preservation, Entomology) and was hosted by the Adult Education Centre at the Royal Botanic Gardens at Kew. There were 23 attendees comprising conservators, curators, collection managers and herbarium technicians. For some it was a revisit of their own technological knowledge, with Kew's modifications, but for most it gave new insight into the care and maintenance of Botanical specimens, however preserved.

### **Herbarium Tour**

A group of 14 early arrivals first saw all four blocks of the Herbarium. Depending on which block you are in you will find either wooden cabinets or the more modern metal type with rubber seals. The fruits are in glass-topped boxes, which are then stored in wooden draws. We were given details of the accession system, which has at its starting point a strict regime of freezing all incoming specimens. Digitisation of Type specimens is now high on Kew's agenda and equipment for the task was well in evidence. Kew's photographer has recently invented the "Herbscan" which enables a Herbarium Sheet to be brought up against an inverted scanner, specimens are then scanned and the images saved in Photoshop. The mounting room looks out on to the Thames and has workstations for at least six mounters. Freshly glued specimens are pressed down with sandbags. . Perhaps the highlight of the tour was a set of Herbarium Sheets holding Lamiaceae specimens collected by Charles Darwin.

### **Cleaning Herbarium Sheets**

Jonathan Farley of Kew's conservation unit gave a detailed talk of how Herbarium Sheets are cleaned at Kew. The proximity of Kew to Central London used to present problems with Kew being downwind from the old Battersea Power Station and hence suffering from its pollutants. Jonathan categorised the two main types of deposits on sheets: surface dirt and ingrained dirt. To remove surface dirt he recommended the use of compressed air (taking extreme care if using the canned type) and then perhaps the use of "Groomstick" a putty like substance which can be rolled lightly over the sheet to pick up the surface dirt ('Blu-tak' was advised against as it contains linseed oil and spreads grease). For ingrained dirt Draftclean (rubber granules) was recommended. Draftclean is applied to the sheet and then rubbed in with cotton wool using light circular motions. Also recommended was the use of a mechanical eraser. Removed ingrained dirt and rubber particles could then be removed from the sheet using compressed air. Jonathan argued against the general use of smoke sponges saying that since they contain diatoms; this could be too abrasive besides depositing diatoms onto the paper, which causes an adverse reaction. Applying a thin coat of Paraloid B72 could consolidate information in pencil.

Minor tears in sheet could be repaired using "Filmoplast" tape that can be applied to the rear of the sheet and then rubbed with a "bone folder" (a piece of solid plastic about 5" x 3/4" x 1/4" sometimes known as a burnisher). 'Post-it' notes should never be put on sheets as the adhesive that they contain is corrosive.

Groomstick, Draftclean, mechanical erasers and "Filmoplast" tape are available from Conservation by Design Ltd. or Preservation Equipment Ltd. As regards adhesives Jonathan advised that we buy direct from source, as wholesalers tend to dilute the original products lightly. H Marcel Guest ([www.hmgpaint.com](http://www.hmgpaint.com)) are Kew's suppliers of adhesives. A good and reasonably priced supplier of bespoke brushes for cleaning herbarium sheets can be found at [www.rosemaryandco.com](http://www.rosemaryandco.com)

For treating sheets infested with mould Jonathan felt that it would be best to first determine whether or not the mould was active by putting the sheet under an ultraviolet light (although a specialist may have to be on hand to give a positive or negative result). Freezing could then be employed to neutralise the mould.

### **Mounting Techniques**

Barry Blewett gave a session on mounting techniques recommended by Kew.

Only one Herbarium, Riga, does not mount specimens and they hold them in Helsinki folders (basically "Type" folders without the red markings). This is ok for the scientific study of specimens but it does not give them any

physical security (they may fall out and be accidentally trampled).

Barry raised the question of strapping versus mounting. Both methods had advantages and disadvantages but for larger institutions where specimens were constantly being loaned around the world by post gluing minimised specimen movement. Examples of bad mounting and strapping were shown from China and Thailand respectively.

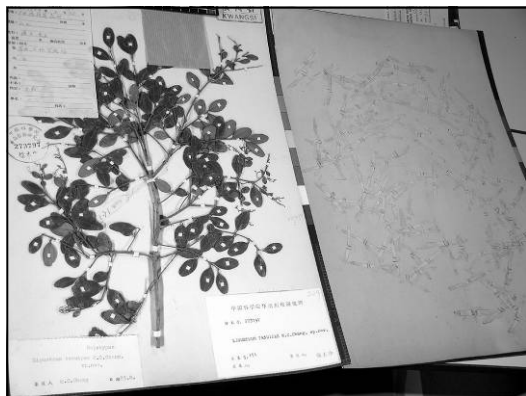


Figure 2: Chinese mount



Figure 1: Thai mount

He then gave a demonstration of Kew's mounting method. Most relevant points were that delicate tissues (such as petals) should never be glued as they may crack when the Herbarium Sheet is handled or frozen. Large flowers should (where possible) be covered with a 'window' of greaseproof paper. When putting specimens in packets, flowers should never go into Glassine envelopes, as taking them out will cause damage. Paper clips on packets should be the type with the flat top as they minimise the risk of tears and damage to packet contents. If specimens are stitched on to the sheet a gummed paper label should be put on over the knot back on the sheet to prevent damage to other sheets in the species folder.

For limp specimens, in particular algae, Barry recommended that a line should be drawn around the specimen on the Herbarium sheet; then remove the specimen, apply glue directly to the sheet and then place the specimen on to the glue. After pressing and drying the pencil lines could then be erased.

Barry finished his talk by pointing out that when conserving specimens Kew staff not only had to take into account the scientific value of specimens but their value to humanity. In this connection Barry showed some plants that had been collected, dried and mounted on prison wallpaper by a Russian botanist while he was a political prisoner in the old Soviet Union.

### Fungal Collections

Brian Spooner Curator of Kew's Mycology collections gave a talk on the Kew Fungal collections.

The Herbarium holds approximately 800,000 specimens, a figure that includes approximately 35,000 types. Being of great global significance it is being moved to a new, more modern facility in the Jodrell Laboratory where a temperature of 20°C and a Humidity of between 40-60% can be maintained. Kew also holds a large selection of slime moulds.

Fungal specimens are heat dried at around 40 degrees Celsius and put into packets made from archival paper (the same as used on flowering plant herbarium sheets). Accompanying labels and drawings are put on to the front of the packet and these packets are mounted on to Kew Herbarium sheets. Larger specimens are kept in glass-topped boxes (the same ones as in carpological collections). If maintaining shape is a priority then storing in spirit may be an answer but not if colour need to be preserved.

As for putting Fungi on public display Brian said that light levels might be a problem for certain species.

Simon Moore, Conservator of Natural Sciences at Hampshire County Council then spoke on his experience of freeze drying of fungal collections. Simon felt that most fungal colours were maintained very well by freeze drying, although some of the paler species quickly browned. Hampshire CC was fortunate to have an old Edwards EF2 Freeze specimen dryer. He did find that the process did not kill certain pests, even at 0.1 atmospheres. Liquid Nitrogen immersion produces ice that does not rupture cell membranes but since the specimens are never de-frosted until totally dry this did not matter. Impor-

tant taxonomic micro-features were still perfectly preserved by the process.

An important point to come out of the session was that holding certain fungi in museum collections is equivalent to holding class A drugs and a license must be obtained from the Home Office. More information is available from:

[mvcology@kew.org](mailto:mvcology@kew.org)

### **Pests**

Ruth Clarke of Kew gave us an outline of Kew's strategy for dealing with pests in their Herbarium.

The main problems at Kew are with *Stegobium paniceum* (Biscuit Beetle), *Lasioderma serricornis* (Cigarette Beetle) and Varied Carpet Beetle (*Anthrenus verbasci*). Carpet beetles were known to damage Pitcher Plant specimens as they eat their way through the plant material to get to trapped dead insects. They will also eat pollen and nectar. Booklice and Silverfish are more grazers and damage labels.

In Kew's new wing there will be a sealed unit to protect particularly sensitive specimens (Asteraceae particularly) from damage from Biscuit and Cigarette Beetle. Temperatures will be a constant 15°C at which these beetles can function but not breed.

Kew has a pest awareness training programme for all staff and take the precaution of disallowing eating in the Herbarium. There is a strict cleaning regime paying particular attention to the removal of dead House flies as they provide food for pest insects. Pest proof cardboard boxes are used to transport specimens between rooms in the Herbarium. Pest Monitoring is carried out using strategically placed sticky 'blunder' traps that are checked every three months. Every year a report showing the results of the trapping is then issued. The only insecticides now permitted for use are the Pyrethrins such as 'Constrain', which contains Permethrin. Treatment of infested materials is either by freezing, by the use of heat or by use of a controlled atmosphere. Infested material is frozen to -30 °C for over 72 hours. Heat treatments can be used but temperatures reaching 55°C for 18 hours could cause problems for certain specimens. Flooding an area with Carbon Dioxide is an option but it could take the area out of commission for three weeks. Registered specialist companies carry out this practice. There is also the option of putting infested specimens in a sealed plastic bag with an Oxygen Scavenger ('Ageless'). There are specific pheromone lures available for specific pests and also desiccant powders that can be put down (these may be particularly useful in "dead" spaces).

Central Science Laboratory publishes a useful set of cards giving images and details of insect pests and how to deal with them ([csl.gov.uk](http://csl.gov.uk)) and Kew have made use of these.

Kew's strategy for Pest Management will be outlined in a new edition of their *Herbarium Handbook* that is currently being prepared for publication.

### **Conserving the Lightfoot Collection of Marine Algae**

Jenny Bryant, Curator of Algae at the Natural History Museum, spoke on the conservation of a collection of c. 600 algae made by the Reverend John Lightfoot, the 18<sup>th</sup> Century Botanist who recognized and named 18 new species of marine algae.

By a circuitous route the collection ended up in the attic of Saffron Waldron Museum where it lay in extremely poor conservation conditions for many years. It finally arrived at the NHM by way of Kew and was recently incorporated into the collections having been stabilized and conserved by Emma Ruffle.

The specimens were first taken out of the 18<sup>th</sup> century paper covers and any information removed from the covers and kept with the specimen. Some of the specimens were so delicate or fragmented that they had to be put into folds of special Japanese tissue before they could be put into Herbarium packets and mounted ready for bar-coding and data-entry. Packets were often lined with the material from the original folders. Bespoke packets, prepared from archival paper, were made for the large specimens. None of the algal specimens were put in the press and all were encapsulated using the original or archival paper. Labels were repaired using Japanese tissue and some were held in Melinex sleeves when either too fragile to mount or with annotation on both sides. The main conservation aim was to minimize future handling of the fragile material.

During the conservation and incorporation of the collection the BM curator found some previously unrecognised Type specimens and two of the earliest named algal records for the greater London area. An interesting development on the day was that the conference delegates from Plymouth Museum recognized some

of the writing on the Lightfoot material as being the same as for some collections in their charge.

### Self-destruct Acidification in Carrageenophyte Algae

Jenny Bryant went on to show acid-damaged marine algae specimens that were suffering from a self-destruct process caused by spontaneous hydrolysis of sulphate half-ester groups associated with carrageenans, a commercially important algal product. The deterioration has no known trigger and if the acidification remains unchecked it destroys the specimen and the sheets above and below. Physical removal of the affected parts and re-mounting can halt the process, but not in all cases. In order to monitor this problem photocopies are made before and after remedial curation and a regular check of the affected carrageen containing genera is carried out. The phenomenon is a worldwide problem in herbaria and was *not* noted prior to the 1980's.

### The Kew Spirit Collection

Emma Tredwell who is collections manager of the Kew Spirit Collection was the last speaker for the day and outlined the pros and cons of keeping Botanical Collections in Spirit: keeping certain specimens in spirit could be advantageous. The three dimensional aspect is maintained and there is no problem with degradation or insect damage. The down side was of course that jars take up comparatively large amounts of space and spirit evaporates over time.

Orchids, particularly, are better kept in spirit than as pressed specimens on paper. Araceae specimens are also often better studied in three dimensions.

Emma found that jars with rubber tops were the best of those available. As for label writing, Emma particularly recommended the Mitsubishi Unipen.

Information on Kew's spirit collection is available from [spiritcollection@kew.org](mailto:spiritcollection@kew.org)

All attendees thanked all presenters and organiser Simon Moore for their efforts on what turned out to be a most informative and useful day.



## **Calls For Information**

### **Is there a Zanzibar leopard in your collection?**

For about ten years Dr Martin Walsh and I have been investigating the Zanzibar leopard (*Panthera pardus adersi*), an endemic subspecies found on the main island of the Zanzibar archipelago, off the coast of Tanzania (East Africa). In international scientific circles, the Zanzibar leopard is generally assumed to have been extirpated during recent decades, though Zanzibaris (who associate the leopard with witchcraft) continue to report leopard sightings and attacks on livestock. We've presented our findings in several peer-reviewed and popular publications, which we are happy to send electronically to anyone interested.

To our knowledge, leopards' skins (sometimes accompanied by skulls) documented to have originated in Zanzibar (all collected pre-WWII) are located in just three museums: Zanzibar's Museum of Natural History; the Natural History Museum in London; and the Harvard Museum of Comparative Zoology in Cambridge, Massachusetts. I've had the opportunity to examine first-hand all of these specimens.

We would be very grateful for tips leading us to Zanzibar leopard skins (or other parts!) stored in museum collections elsewhere. More generally, we're interested in any information relating to the Zanzibar leopard and hunting in Zanzibar.

Dr Helle V. Goldman  
Norwegian Polar Institute  
Polar Environmental Centre  
NO-9296 Tromsø, Norway  
email: goldman@npolar.no

### **Broad-headed snake enquiry**

The broad-headed *Hoplocephalus bungaroides* (Reptilia: family Elapidae) is probably the most endangered snake in Australia. Its range is only about 250 kilometres radius of Sydney, and it is threatened by urbanization and by rock removal for landscaping. Its decline was noticed as early as 1869 by Gerard Krefft, Director of the Australian Museum, and author of the first book on Australian snakes. Krefft stated in this work that he sent "many hundreds" of specimens of *H. bungaroides* as gifts or on exchange to unnamed "kindred institutions" and to specimen dealers in the 1860s and 1870s. Hence, we are now undertaking a worldwide search of zoological collections for this species.

We have so far found only a small number of specimens preserved in museums and related institutions outside Australia, including Germany, United Kingdom, United States, Austria, Denmark and in the Netherlands. Only about 10 specimens we have found can definitely be attributed to Krefft. For example, in the United Kingdom we have so far found 7 specimens in two museums (Natural History Museum, London and Oxford University Museum of Natural History), but only one of these specimens is attributed to Krefft or as a gift from the Australian Museum. We are seeking help from curators of zoological collections to check on whether *Hoplocephalus bungaroides* is present or absent from their holdings.

If it is absent from your collection, could you please send me a quick email to confirm that for my tabulations. If it is present, it would be greatly appreciated if you could advise me of specimen/registration numbers as well as collection dates and localities, collector name, specimen type (i.e. spirit or skeleton) and other details that may be recorded with the specimens, such as sex, age (adult or juvenile), and length.

Jamie Harris, PhD candidate  
School of Environmental Science and Management  
Southern Cross University, Lismore  
New South Wales, Australia  
email: jharri11@scu.edu.au

### **George Wombwell's Travelling Menagerie**

In the Aberdeen University Zoology Department Museum we have two skeletons, a tapir and a tiger, that are attributed to George Wombwell's travelling menagerie. Presumably they are from animals that died on visits to the north-east. George Wombwell was a well known 19th century showman - and his menagerie went the length and breadth of the country for many years. I would be interested in knowing if other collections have any of his specimens and if there is any archive of his correspondence, publicity material and so on. I'm sure much of it is ephemeral in local newspapers and so on and there are several accounts of the man that come up on a Google search, but if there is anything in more depth I would appreciate hearing about it, or about any of his showman competitors.

Dr Robert Ralph  
robert.ralph@BTINTERNET.COM

### **The Remnants Of The Egg Collection Of Henry Fraser Walter** **- The first Emperor penguin egg (*Aptenodytes forsteri*)**

The first Emperor penguin (*Aptenodytes forsteri*) egg recovered is thought to have been brought back during the French South Polar expedition under Jules-Sebastien-Cesar Dumont D'Urville (1790-1842). Two ships, the 'Astrolabe' and the 'Zélée' departed Toulon on the 7<sup>th</sup> September 1837 and visited the South Orkney Islands, South Shetland Islands, northwest coast of the Trinity Peninsula, the Orléans Channel and Joinville Island, before returning to Toulon on the 6<sup>th</sup> November 1840, having been away for three years and two months. The egg was then purchased in Paris in late 1840 or 1841 by Dr (Sir) Henry Alfred Pitman, who subsequently sold the collection five years later to Henry Fraser Walter of Papplewick Hall, Nottingham (National Antarctic Expedition, Scott et al. 1907).

Contemporary accounts of H. F. Walter's collection are found in 'Great Houses of Nottinghamshire and the County Families' by Leonard Jacks, published in 1881.

"Three or four handsome walnut cabinets form part of the decorative furniture of this apartment. They contain a wonderful collection of birds' eggs—perhaps the best private collection in England. The eggs are arranged in layers of drawers, and are properly named and classified, some attention having been paid to the placing of the different sizes and to the arrangement of colours. Some of the foreign eggs are very beautiful in colour and shape, and there is an almost endless variety, from the tiny pearl-like egg of the humming bird to that of the extinct auk or of the hairy-looking apteryx of New Zealand, a stuffed specimen of which is to be seen outside, in the hall. Eggs of the ostrich, emu, cassowary, and the ova of the alligator are preserved in larger receptacles than the drawers of these cabinets, and two of the eggs of the largest of the feathered tribe have been made into very handsome vases, which form part of the pretty ornamentation of the drawing room"

H. F. Walter was a friend of John Wolley and his collection contained many of his eggs. The collection was bequeathed to his son, John Henry Walter who moved it to Drayton House, Norwich. Here the collection languished in a 'damp room' before being sold on Wednesday the 17<sup>th</sup> of April 1912 at No. 38 King Street, Covent Garden in Stevens auction rooms, by which time 'many of the eggs sold were not in good condition' (Chalmers-Hunt and Dance 1976). It is likely that the collection still contained the egg at this point as Edward Wilson saw the egg at Drayton and noted in his 1907 expedition report 'it has been my privilege to examine and compare [the egg] with those from Cape Crozier and I have no doubt, even if there had been any doubt before, that it is the egg of an Emperor penguin'. The sale seems to have included the majority of the collection, alongside two eggs of the Great Auk belonging to Lady Greville Smyth of Ashton Court, Somerset and a series of model great Auk eggs, as well as eggs of the Emperor goose [*Anser canagica*]. The manuscript catalogue of the auction details the sale as follows:

**The collection of Birds' eggs,**  
*Formed by the late H. F. WALTER, Esq., of Papplewick*  
*And others;*

Due to the state of preservation of the collection, it appears that the significance of the egg was already lost; its only likely mention in the sale catalogue is as 'No. 88 Box of Penguins'. Some eggs and an original catalogue are contained in the collection of Norwich Castle museum and some of Walter's specimens also made it to the Natural History Museum (NHM) via Salmon, Gurney and Meiklejohn. However the egg in question seems to have not been officially recorded since the sale of 1912. Since Emperor penguin eggs were not brought back on either the 'Belgica' or 'Southern Cross' expeditions, the rediscovery of this early egg would be, potentially, both historically and scientifically interesting. It seems likely this egg, picked up on an ice-flow on the summer months of 1837-1838 could be presently unrecognised in a museum or private collection.

Chalmers-Hunt, J. M. and S. P. Dance (1976). Natural history auctions 1700-1972: a register of sales in the British Isles. London, Sotheby Parke Bernet.

National Antarctic Expedition, R. F. Scott, et al. (1907). National Antarctic Expedition [of the S.S. "Discovery", under Captain R.F. Scott], 1901-1904: Natural history [including some specimens obtained by G.A. Davidson of the relief ship, the "Morning"]. London, British Museum.

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### **What's Going On In Your Museum?**

Spread the word about news and events in your museum, here in the Newsletter and on our website. Send me information about new exhibitions and learning developments and we can pass this along to the membership. If you are going to a meeting, why not let us know about it and we'll mention it in the Newsletter, and maybe you'd like to send in a few words about it, so that others can benefit as well. This section is very casual, so don't think you'll have to spend days writing a paper! Please just send us in your impressions so we can pass them along. If you've got an issue which might benefit from a bit of advice, then why not post a question on the *Forum* section of our website? If you are interested in helping spread the word about NatSCA, then please contact me. I have some leaflets that can be distributed when you are going to meetings and conferences. This way, we are all kept informed about what's going on, and we can all support and encourage each other when the times are bad, and congratulate each other, and ourselves when times are good!

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## **Notices, Adverts & Meetings**

### Conferences and Meetings:

#### **Notice of Annual Conference and AGM World Museum Liverpool 27 - 28<sup>th</sup> April 2006**

##### **Selling Natural Science: Developing concepts and ideas for galleries and other public resources**

Natural science collections have a fundamental role to play in promoting the understanding of natural science and creating an increased awareness and fascination of the natural world. How do we use our collections to do this? What issues and subjects in the 21<sup>st</sup> century are we best placed to address? The conference will aim to explore new ways in which we can communicate scientific ideas to the public and will provide an opportunity for an increased sharing of ideas, experiences and expertise.

A more detailed programme and booking forms will be circulated ASAP.

Any suggestions or offers for presentations at this stage contact **Jo Hatton** ([jhatton@horniman.ac.uk](mailto:jhatton@horniman.ac.uk)).

For more info on World Museum Liverpool go to [www.liverpoolmuseums.org.uk](http://www.liverpoolmuseums.org.uk)

#### **GCG seminar, including 32<sup>nd</sup> AGM, and field trip**

5-6<sup>th</sup> December, 2005

Geoparks  
University College, Worcester

Contact:  
Steve McLean, Hancock Museum, Barras Bridge, Newcastle, NE2 4PT  
0191 222 6765 [s.g.mclean@ncl.ac.uk](mailto:s.g.mclean@ncl.ac.uk)

**News:****Charmouth Heritage Coast Centre**

We were recently involved in the development of a project providing the unique opportunity to display and view otherwise inaccessible fossil collections from the World Heritage Site: Jurassic Coast. A touch monitor installation in the Charmouth Heritage Coast Centre showcases virtual galleries including an identification guide, visitor's finds, paleontologist exhibitions, and professional collections. Collectors are able to remotely upload and annotate their images.

To learn more about this project, please visit:

[http://studioup.com/portfolio\\_sites/fossil\\_portfolio/fossil\\_portfolio.html](http://studioup.com/portfolio_sites/fossil_portfolio/fossil_portfolio.html)

**Training:****Fluid-preservation course**

Is all or part of your fluid-preserved collection the shame of your museum so that it's shunted into some back room or exterior storage area?

Do your gallery fluid-preserved specimens require attention?

Do you or your managers understand the importance of fluid-preserved specimens?

Do you need to know how to mount fragile specimens in fluids, seal those awkward glass jars, understand the basics about fixatives and preservatives?

Simon Moore is presenting a course to redress all of these problems at Oxford University Natural History Museum from the 3rd to 6th April 2006.

Cost is low. £200 for the course: including presentations, practical sessions and handouts.

If you have any specific problems either bring them along or ask if this problem could be incorporated into the course (notify Simon first).

Please also notify Simon of any personal allergies – asthma, dermatitis &c.

The Museum will provide some problem specimens but feel free to bring along any portable problem specimens (we will need something extra to work on) but preferably not too valuable!

Some nearby and cheaper student B&B accommodation will be available – first-come basis.

B&Bs in Banbury Road area are within walking distance depending how far up, but there is a regular bus service.

Please notify Simon Moore: [couteaфин@aol.com](mailto:couteaфин@aol.com)

Or by telephone: 01962 826737. Closing date for application 10<sup>th</sup> March but *please* don't leave it until the last moment!

**Training:****NatSCA Biochemistry Seminar**

A seminar is proposed to improve your knowledge and help you to understand the biochemical building blocks of our charges and the technology required to conserve and maintain natural science collections with practical/hands-on demonstrations.

**Requirements – please let me know if you can help with the following:**

A venue with laboratory facilities for up to 30 or more persons, including presentation facilities.

Very important: **speakers** for the topics below and to write-up their talks for *NatSCA News*.

I would be hoping that this seminar will take place, October or November 2006.

Finally, if this proves to be so popular that a 2-day event would be needed, then bear this in mind when suggesting facilities.

If anyone would like to contribute to this or knows of anyone who might like to contribute, then please contact me at the address below.

**Proposed topics could include:**

Biochemistry issues (both zoological and botanical, and if possible, geological too) with practical demos if possible.

Building blocks of what specimens comprise.

- Effects of fluid preservation and preservatives.
- Effects of drying and drying out!
- Effects of other deteriorogens. We know that fungal infestation can alter the biochemistry of specimens (what happens to them chemically?) Can pests also compromise the biochemical make-up of specimens?
- Effects of fumigants and other pest treatments (cf. Thermolignum), can these alter the structure of specimens?
- Dealing with fur and feather problems – how does ‘taxidermed’ subcutaneous ‘fat’ oxidise. Why do fur and feathers become embrittled and start breaking?
- Chemical effects of fading and other colour loss – why do pinned dragonflies go brown so quickly, what happens to their pigment?
- Chemical changes that can affect herbarium specimens.
- Ditto for microslide preparations.
- Analysing problems for future prevention.

Contact:

Simon Moore - [simon.moore@hants.gov.uk](mailto:simon.moore@hants.gov.uk)

01962 826737