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Title: The Reorganisation of the Natural History Museum's Avian Spirit Collection

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c) there is a need to reconsider some of the preservation procedures on newly collected specimens so that they cause minimal damage to DNA

d) there are alternative methods of preservation of animal tissue or of entire specimens for DNA work, for example the use of 90% or absolute ethanol, or deep freezing at –70°C.

Molecular biology is a fast evolving field, and new techniques and applications are constantly being devised that are relevant to spirit preserved museum specimens. Many museums around the world now have molecular biology facilities, and *ad hoc* policies are being introduced to regulate the loan and sampling of biological specimens. Curators and molecular biologists are beginning to collaborate towards a new understanding of specimen conservation, and I have no doubts that in the near future all newly collected biological specimens will be preserved with its possible use in molecular biology very much in mind.

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THE REORGANISATION OF THE NATURAL HISTORY MUSEUM'S AVIAN SPIRIT COLLECTION

Introduction

The Natural History Museum's avian spirit collection, currently comprising *circa* 15000 specimens of 3000 species, is the third largest in the world and the one holding the greatest number of species (Zusi *et al* 1982). The collection was moved from London to Tring in 1972 and is now situated on the specially ventilated ground floor of a purpose-built air-conditioned building. Jars of specimens were arranged in family order in accordance with Peters' *Checklist of Birds of the World* (1931-86) and placed on rows of open steel cabinet shelving. Further information on the composition of the collection and on its curation in the mid 1970s may be found in Blandamer and Burton (1979).

Preparation of fresh material had led to considerable expansion of the collection and had created a considerable overcrowding problem. This adversely affected both respiriting and the location of specimens. Fortunately, there remained three empty rows of cabinets set aside for expansion at the end of the collection which could be utilised, and a major reorganisation project for the whole spirit collection was decided upon in 1992.

Aims

-To eliminate the existing overcrowding problem, making specimens accessible.
-To shelf-label and index the collection at the generic level to aid efficient location of specimens.
-To locate and separate all extinct and endangered species from the main collection.

Procedure

Following a preliminary rough assessment of the amount of space each family would require, the rearrangement of jars began. Two staff members working backwards from the end of the collection towards the beginning, arranged the jars for each family in alphabetical order of genus using the free shelving as working space. Once in alphabetical order, the jars were then shifted to their new location at the end of the free shelving and arranged in Peters' order of genus and species. The jars were positioned only 1-2 deep on the shelving to facilitate the reading of specimen labels as well as to assess spirit levels. The bottom shelf of each cabinet was left empty wherever possible to allow for future expansion. Temporary 'post-it'labels were used to list the contents of each shelf of every cabinet.

At the same time all unlabelled, illegible or clearly misidentified jars of specimens were removed from the collection and set aside for a further two staff members to work on. Once the problems were rectified, these jars were re-incorporated into the newly arranged collections.

Jars which were labelled with obsolete generic names were temporarily given 'post-it' notes with their modern names. When the general reorganisation was complete, permanent internal labels were prepared and added to these jars without removing the original labels. All extinct and endangered material was removed from the main collection and incorporated into a separate extinct and endangered collection which is housed, also in Peters' order, in three locked steel cabinets. Once the rearrangement of the collection was complete, new family labels were printed for each

cabinet, and new genus labels for each shelf within each cabinet, using a word processor and thin card.

To facilitate the location of specimens, a comprehensive hand-held index, arranged in alphabetical order, was later compiled, indicating genus, species and their corresponding cabinet numbers. A word processor was also used to print an index of family and subfamily names, again with their cabinet numbers, which was attached to both ends of each row of cabinets.

With the reorganisation complete after a man-year of work, the Natural History Museum's avian spirit collection is now conveniently housed and easy to use. This not only improves accessibility to the collection for both visitors and staff, but also ensures a higher standard of preservation of specimens and therefore should increase the general 'shelf-life' of the collection.

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LABELLING OF SPECIMENS PRESERVED IN SPIRIT COLLECTIONS

Introduction

Many, if not most spirit collections in UK museums have traditionally used paper-based labels. In 1961 it was reported (Ross 1961) that so-called Goatskin Parchment was a satisfactory material for the long-term labelling of specimens immersed in alcohol and other aqueous-based materials. However, like the Holy Roman Empire, the term 'Goatskin Parchment' is somewhat of a misnomer and is actually a rosin-sized wood-pulp paper. Recent changes in the method of sizing (from tub-sizing) causes the parchment to soften and weaken in the preservative solutions after a relatively short period (Kishinami 1989).

The introduction of computer-based labelling systems offered the opportunity to generate large quantities of individual, neat labels quickly and easily. Unfortunately, laser-printed labels were found to be impermanent as they are based on a plastic powder, being heat-fused to the paper. Alcohol and other solutions caused the powder pigment to become disassociated from the paper and fall in a heap at the bottom of the jar.

Solutions

High quality and cellulose papers are found to be resistant to most preservative solutions. Byron-Weston Resistall papers which are of a high quality cellulose material have long been used in the U.S. and are now available in the U.K. Alternative materials have not been so successful for a number of reasons. Tyvek - a spin-bonded polythene material - although resistant to most solvents, floats in many of them and is sometimes difficult to write or print on. Plastic and plastic-coated papers such as Synteepe and Polypaper are also difficult to write or print on permanently (Pettitt 1976).

There appears to be a number of solutions to the labelling problems. Rotring 17 ink (Williams and Hawks 1986) is a suitable writing medium for most paper-based labels, being relatively fadeproof and solvent resistant. Most commercial oil-based printing inks are also fine for immersed labels, but standard typewriter inks can leach out into alcohol solutions colouring them a deep purple. Possible answers to long-life computer generated labelling may involve the use of dot-matrix and ink-jet printers and tests are currently being carried out to assess them.

Recently a number of firms have started producing so-called permanent labelling with both writing and bar-code options. For instance, Computer Imprintable Labels Systems Limited (Unit 30, Home Farm Business Centre, Home Farm road, Brighton, BN1 9HU. Tel 0273 681000) provide a range of durable labelling systems that offer hope for the future of rapidly produced permanent labels.

Perhaps the best current advice, is not to use any Goatskin Parchment that has been purchased in the last ten years, and to use a high quality paper alternative, such as Byron-Weston Resistall paper, or Atlantis Archival Copysafe. Tried and tested inks and printing methods should be continued until the new systems have been adequately evaluated.

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