The Biology Curator

The Publication of the Biology Curator's Group

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Diary Dates

Geology for Beginners
1st February 1999, North Lincolnshire Museum

Insect Pests in Museums
16-17 March 1999, Natural History Museum, London. A two day course by David Pinniger covering pests and damage, pest identification, pest monitoring and control and pest management amongst other topics of interest to all those with a responsibility for Natural History.
Contact: Phil Ackery, Dept. of Entomology, Natural History Museum, Cromwell Road, London, SW7 5BD Tel: 0171 938 9346.

Skin and Bones with BCG AGM
22-24 April 1999
First Day: Bones, Natural History Museum, London
Second Day: Taxidermy and AGM, Powell Cotton Museum

Return to Leiden
Oct/Nov 1999

St. Petersburg
2000

North American Meeting
2001

BCG News

Committee Business

Best Value: A new Government scheme that has wide-ranging implications for all Museum services.

Trust Status: Increasing numbers of Museums are investigating this avenue.

Collections at Risk Cell: There is currently concern over 10 Natural History Services. Contact: Mike Palmer. Tel. 0181 343 7081.

Biological Recording Cell: The NBN Scheme has been drastically scaled down so the development of a national network is under question. Contact: Howard Mendel. Tel: 0171 938 9452. Fax: 0171 938 8937.

Conservation Cell: Contact: Nick Gordon. Tel/Fax: 01296 696012.

Documentation Cell: Contact: Nick Goff. Tel. 01934 621028. Fax: 01934 612526.

Contents

Deadline: All items for next publication to reach Editors by 8th January 1999.

Criteria for Evaluating the Importance of Herbarium Collections

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Introduction

When allocating limited resources to maintaining herbarium collections, it is becoming increasingly important to prioritise. Whilst it is obvious that the most important collections are the highest priority, it is often difficult to decide which the most important collections are, either at the level of the whole herbarium or of its component parts. At a national level, decisions rarely have to be made about the relative value of individual herbaria such as that of the Natural History Museum compared with Bristol City Museum (BRISTM), though placing them in a national context may help secure funding, resources within universities or county councils, etc.. More regularly, decisions have to be made within herbaria about allocation of resources to different individual collections.

The aim of this discussion paper is to propose some criteria for evaluating the importance of collections to assist with allocation of resources. The criteria have been drawn up for Vascular Plant collections, but could easily be adapted to cover Cryptogamic herbaria or herbaria of cultivated plants, or even zoological collections. A specimen is defined here as a herbarium sheet (or sheets if there is more than one part to a collection) rather than as an individual plant mounted with others on a single herbarium sheet. A region is essentially a county or small group of counties (e.g. Cambridgeshire, N. Wales). The collections has been ranked into three categories of importance:

- Internationally important: Important within an international context. Essential for any floristic or taxonomic work at a national or international level.
- Nationally important: Important within a national context, irrespective of the size of the country. Should be consulted for any floristic or taxonomic work at a regional or national level.
- Regionally important: Important within the context of a county/region, or small group of counties/regions. Useful additional data for a regional floristic or taxonomic work.

Collections falling below the thresholds for the categories proposed below could be classed as of local or low importance, but are not dealt with further.

Criteria for assessing value of herbaria

1. Size of collection

The total number of specimens in a herbarium is clearly of major importance in deciding its value.

The number of specimens for each category are proposed as follows:

- Internationally important: 2 50,000+ specimens
- Nationally important: 50,000+ specimens
- Regionally important: 5,000+ specimens

2. Coverage of country

Herbaria with the main collections (in terms of numbers of specimens and coverage of taxa) for a particular country are clearly very important as key sets of reference material. The criteria for assessing the value as floristic collections are proposed as follows:

- Internationally important: One of the top five collections for that country in the world
- Nationally important: One of the top 20 collections for that country in the world
- Regionally important: One of the top 100 collections for that country in the world

3. Types

Type specimens are priceless assets for solving taxonomic and nomenclatural problems and provide definitive sources of reference. Whilst each individual type specimen could be regarded as top priority in its own right, herbaria with more types are likely to be of greater importance than those with few types. The numbers of types for each category are proposed as follows:

- Internationally important: 200+ holotypes or 500+ isotypes, syntypes, lectotypes or paratypes
- Nationally important: 50+ holotypes or 200+ isotypes, syntypes, lectotypes or paratypes
- Regionally important: 5+ holotypes/20+ isotypes, syntypes, lectotypes or paratypes

4. Collections by taxon

Large collections of a particular taxon (e.g. Taraxacum at OXF, often as a result of the interest of one botanist or a research project from one institution, are of particular value for monographs. The criteria are proposed as follows:

- Internationally important: Ten or more different collections held which qualify as one of top five taxon-based collections in the country
- Nationally important: Five to nine different collections held which qualify as one of top five taxon-based collections in the country
- Regionally important: One to four different collections held which qualify as one of top five taxon-based collections in the country

5. Collections of individual botanists

Most herbaria are composed of a series of collections by different botanists and these individual collections vary in importance due to numbers of specimens, location, taxonomic coverage, uniqueness and historical importance. In some cases collections have been split between a number of herbaria. The combined individual components will determine the status of the herbarium as a whole, but a collection within a herbarium may be of international importance in its own right, even if the herbarium itself is not. For instance, the collections of Linnaeus is clearly of

international importance, but what of those of Donald Grose author of Flora of Wiltshire (DVS), or Phyllis Stockdale a local Sussex botanist (BEX; Rich, Nicholson & Woods 1996)? Each has to be judged on its own merits. The criteria proposed are as follows:

Internationally important:

- Any one collection of major national or international botanists (e.g. Linnaeus, Bentham)
- Five or more collections of major national or international experts on particular floras/families/genera/groups (e.g. Glück aquatic herbarium in B, Druce herbarium in OXF)
- Any one collection of major historical significance (e.g. Darwin Voyage of the Beagle collections)

  Any one collection forming the basis of a national monograph or flora (e.g. E. S. Edees Rubus herbarium in NMW)

Nationally important:

- Five or more large or unique collections of main botanists in country or region (e.g. C. T. & E. Vachell herbarium in NMW; herb. L. A. Livermore in LIV; herb. J. W. White in BRISTM)

Regionally important:

- Five or more good collections of local botanists (e.g. herb. R. F. May in NMW)

6. Usage

It is a circular argument that herbaria which are widely used are more important, because botanists tend to go to the top herbaria anyway. However, herbaria which are widely used do tend to be of greater value as the taxonomic arrangement is often more up to date, and the specimens are critically determined and more widely consulted or cited. There are various measures of usage which can be used, and the criteria proposed to cover these are given below. Other forms of enquiry, such as internet database searches, could also be included.

Loans

- Internationally important: 200+/year
- Nationally important: 50+/year
- Regionally important: 5+/year

Visitors

- Internationally important 50+/year
- Nationally important: 20+/year
- Regionally important: 5+/year

Cited or referenced specimens

Specimens cited by particular authors or botanists as representative or as types clearly have added value.

- Internationally important: Extensive use or citation of collections in national / international monographs, or use in preparation of national flora.
- Nationally important: Use or citation of at least some collections in national / international monographs, or collections representing county floras.
- Regionally important: Contains good local collections.

Example - herb. National Museum of Wales (NMW)

The herbarium of the National Museum of Wales (NMW) can be placed in its British context by scoring against the criteria as follows:

1.	Size	Internationally important: c. 250,000 specimens
2.	Coverage	Internationally important: The best collection of Welsh plants in the world
3.	Types	Nationally important: Only 24 holotypes but c. 300 iso-/syn-/lecto/paratypes (Carey et al. 1997)
4.	Taxa	Probably of national importance: major collections of Rubus, Rosa, Cotoneaster, Pteridophytes (and especially Dryopteris), Mentha, Salix, Populus, Melampyrum, and possibly Myosotis and Euphrasia.
5.	Individual botanists	Nationally important (e.g. herbs. J. A. Wheldon, W. A. Shoolbred, P. A. Deseglise, F. Rose etc.; see Harrison 1985): Collections relating to Welsh ferns, Welsh timber trees, Welsh flowering plants and Brambles of the British Isles
6.	Usage	Nationally important: 36 loans in 1997, c. 150 visitors and many specimens regularly cited or referenced.

Overall the herbarium is of international importance.

Criteria for assessing value of individual collections

1. Size of collection

The total number of specimens in a single collection is clearly of major importance in deciding its value, and the criteria proposed are as follows:

- Internationally important: 25,000+ specimens
- Nationally important: 5,000+ specimens
- Regionally important: 2,000+ specimens

2. Coverage of region/county

The main collections for a particular region or county are clearly important, but due to the size of the collections for each country in major herbaria it is unlikely that individual collection would be included in the top collections for a country (though there may be some examples). The criteria proposed are as follows:

- Internationally important: The top collection for that region/county in the country
- Nationally important: One of the top 20 collections for that region/county in the country
- Regionally important: One of the top 100 collections for that region/county in the country

3. Types

Individual collections with more types are likely to be of greater importance than those with few types.

The numbers of types for each category are therefore proposed as follows:

- Internationally important: 50+ holotypes or 200+ isotypes, syntypes, lectotypes or paratypes
- Nationally important: 5+ holotypes or 20+ isotypes, syntypes, lectotypes or paratypes
- Regionally important: 1+ holotypes/2+ isotypes, syntypes, lectotypes or paratypes

4. Collections by taxon

Large collections of a particular taxon often result of the interest of one botanist, and are very important in illustrating their concepts of species. The proposed criteria for each category are as follows:

- Internationally important: One of top 3 collections for that taxon in the country
- Nationally important: One of top 10 collections for that taxon in the country
- Regionally important: One of top 20 collections for that taxon in the country

5. Collections of individual botanists

The criteria proposed for assessing importance of individual collections are as follows:

Internationally important:

- Collections of major national or international botanists
- Collections of major national or international experts on particular floras / families / genera / groups
- Collections of major historical significance
- Collections linked to national flora or monograph

Nationally important:

- Large or unique collections of main botanists in country or region
- Collections linked to county flora or monograph

Regionally important:

- Good collections by local botanists
- Duplicate collections of main botanists for country

Example - herb. E. S. Edees

E. S. Edees was one of the leading experts in Rubus in Britain, and his monograph with A. Newton forms the basis of our current understanding of brambles in Britain (Edees & Newton 1988). His herbarium of about 7,500 specimens (including many types) allows us to link the book to the specimens he worked on, and is now the key reference collection for anyone working on brambles in Britain.

1. Size of collection	Nationally important: 7,500+ specimens
2. Coverage of region/county	Not applicable (a taxon-based collection)
3. Types	Nationally important: 22 holotypes and c. 300 iso-/syn-/lecto-/paratypes
4. Taxon	Internationally important: One of top 2 Rubus collections in Britain
5. Individual botanists	Internationally important: Collection of major national expert linked to monograph on Rubus

Overall the Edees collection is of international importance.

Discussion

The criteria provide a quantitative basis for comparison of collections, but some criteria still depend on definitions, such as what constitutes a "good" collection by a botanist? This can only be determined once the context is known and some may depend on expert opinions of taxonomists or specialist botanists. For instance a comprehensive herbarium of the Shetland Islands would still contain many fewer specimens than an incomplete one from Surrey, but might be considered more important. Some criteria may also be difficult to use as the information is simply not available - for instance what are the top 20, or even top 10, Sorbus collections in Britain? I would welcome comments on the criteria or the quantitative limits, and on additional criteria.

Many herbaria of course already have a good idea of which their important collections are, but an assessment exercise helps to establish those which are currently under- or over-valued. The failure of a collection or herbarium to meet the regional, national or international categories does not mean that the collections are of no value, they are just of relatively low priority.

References

Carey, J. L., Evans, M., Purewal, V., Randall, R. D., Sewell, R. M., Spears, R. & Rich, T. C. G. (1997). Catalogue of vascular plant type specimens, National Museum & Gallery, Cardiff National Museum & Gallery, Cardiff

Edees, E. S. & Newton, A. (1988). Brambles of the British Isles. Ray Society, London.

Harrison, S. G. (1985). Index of collectors in the Welsh National Herbarium. National Museum of Wales, Cardiff

Rich, T. C. G., Nicholson, R. A. & Woods, P. (1996). Phyllis Stockdale (c. 1898-1949), a Sussex botanist. Eastbourne Natural History Society Newsletter April 1996.

Conservation Project Reaches Milestone

In 1992 a project was launched to conserve the Roylean herbarium held at Liverpool Museum. John Forbes Royle amassed the core of the collection between 1823 and 1831 when he was superintendent of the Saharanpur Botanic Garden in India. There are also examples of material from as early as the 1760's. Most of the specimens were gathered in the Himalayas but later Royle added plants from South Africa, Siberia and Chile.

Royle's widow donated the herbarium to the Liverpool Royal Institution after his death in 1859. However, it was effectively lost to science until it was rediscovered among the remnants of the Institution's museum in 1952. In the 1990's it was decided to launch two projects to conserve and document this important historical collection.

The collection was in a very poor state. Conservators from the Paper Section of NMGM and curators collaborated to arrive at a method in which to proceed with the project. This successfully combined the knowledge and standards of paper conservation with the techniques of plant mounters and the requirements for use by researchers.

At the outset of the project it was thought that there was a possible 100 Type specimens within the collection. After intensive re-curation, following conservation, it is now estimated to contain over 600.

In the first week of September this year the 10,000th specimen was conserved (the collection possibly contains 13,000) by Aileen Collis, Assistant Conservator. To celebrate this milestone an event was organised to re-unite all the staff, past and present, who have worked as Conservators or Curators on the collection. The local press were invited to view the 10,000th specimen (Cyperus corymbosus) along with other parts of the collection.

Details of the methods used in this project can be found in:

Walker, N. & Hughes, D. (1994) The Royle Herbarium - a Conservation Approach, in Child, B. (ed) Conservation and the Herbarium. The Institute of Paper Conservation: Leigh. ISBN 0 9507268 6 9

All staff past and present, conservators and curators, who have been involved either on the conservation or documentation project, got together to mark the event.
Pictured left to right are: Leander Wolstenholme, Claire Smith, John Edmondson, Angus Gunn, Aileen Collis, Nicola Walker, Donna Hughes and Carrie Cotgrove.

The Reconstitution of Dehydrated Museum Specimens II

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The evaporation of preservatives and subsequent dehydration of specimens is a major problem in many zoological collections. Vogt (1991) reviewed existing methods and proposed a method of reconstituting specimens based on acetic acids and low pH treatments. The low pH (between 3 and 4) is not the most desirable conditions and can lead to damaging some specimens or characteristics that are of taxonomic importance. This paper describes a new method, which operates at a higher pH and is gentler on specimens.

Methods

A wet-weight of twenty specimens of salmon fry and sac-fry was taken to the nearest milligram on a Metler analytical balance. Wet weights of four frogs and three perch were taken on a Metler balance to the nearest hundredth of a gram. Specimens were air dried in a fume hood for four days and then weighed. The specimens were placed in individual containers containing a 10% solution (volume to volume) of an enzymatic drain cleaner-build up remover. The pH of the solution was 6.5. The brand names were "Drano-Max" and "Liquid Plumber Buildup Remover." Specimens were weighed at one-week intervals. Specimens were kept in the solution for a three-week period. A Kruskal-Wallis test (Conover, 1980) was used to compare the weight gains of salmon fry from the Vogt (1991) technique and the technique reported here.

Results

The salmon fry and sac-fry revealed an average gain of 85% in wet weight and retained 97% of their wet weight after 6 months in 70% ethanol. Fins on the fry were malleable. The yolk sac on the sac-fry did not rehydrate to its original condition. A similar result was observed in the Vogt (1991) technique. Weight gains in the fry were significantly higher (P=0.045) than in the Vogt (1991) technique.

Larger specimens, the frogs and perch, were not as consistent in their response to the technique. The recovery of weight in the frogs ranged from 30-48%. The jaws, appendages, and digits were malleable in all specimens. The frogs never recovered the girth that was present in the abdomen in the original specimens. The recovery in the three perch specimens ranged from 58-71% of the original specimen weight.

Discussion

The pH of the enzymatic solution used in this technique lends itself to use with a variety of specimens. The solution does not require special storage procedures that acetic acid would. Specimens have been stored for approximately one year with no adverse effects. The enzymatic solutions are more readily available and cost less than acetic acid.

A technique using a vacuum chamber was developed but gave inconsistent results and the specimens of juvenile fish were of little use for systematic studies (B. Urbain, University of Washington, pers. comm.). The inconsistent results and the need for expensive equipment (vacuum chamber) that is not available to many museum collections lead to the abandonment of this technique.

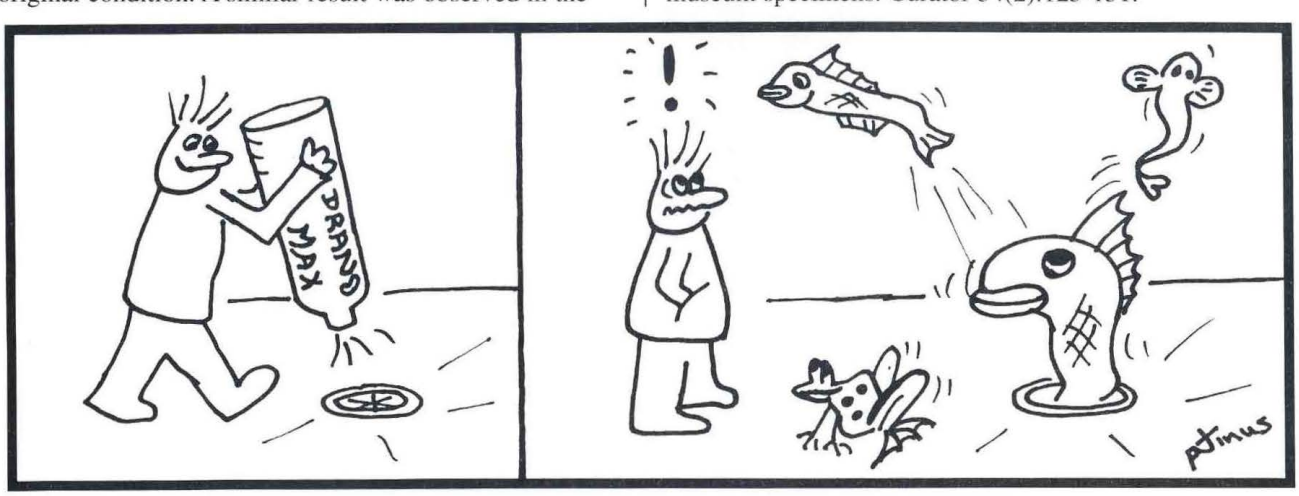
Acknowledgements

I wish to thank Drs. Carl Burger and Richard Wilmot, formerly U.S. Fish & Wildlife Service, who provided the specimens of fry and sac-fry. The Department of Ichthyology, Canadian Museum of Nature, and the Fish Collection, University of Washington provided specimens for use. The Department of Chemistry, University of Alaska, Anchorage provided the use of the analytical balance.

Literature Cited

Conover, W. J. 1980. Practical Nonparametric Statistics. 2nd. ed. Wiley, New York, 493 pp.

Vogt, K. D. 1991. The reconstitution of dehydrated museum specimens. Curator 34(2):125-131.



Best Value — What's it all about?

A number of museums will already be only too aware of the implications of Best Value, but all of us will be involved, whether we like it or not! Legislation will be in place by April 2000 to make it compulsory for all tax-raising Local Authorities, but most Local Authorities are already developing it. Its fundamental purpose is to make it a duty of Local Authorities to provide economic, efficient and effective services.

The Government has said that "there will be no place for the mediocre, no excuse for inefficiency and zero tolerance of waste". It will be a statutory requirement to produce Local Performance Plans which encompass corporate objectives, sustainable development and agreed targets for service improvement. Local Authority Museums will all be included.

Government officials have said that Best Value is all about driving up standards and driving down costs; continuous improvement and encouraging partnerships. The Government has also made it clear that the Arts will only be taken seriously if they market themselves as part of the local economy of an area.

These developments can be seen as a real opportunity as well as threat. However, it is worth bearing in mind that there may be sanctions for under-performing Authorities. The Government may intervene to bring in external assistance, to enforce competition or even to transfer service provision to a third party! Whichever way you see them, it will undoubtedly require considerable resources to establish Best Value procedures.

If you want to know more, then I suggest that you track down your Best Value Support Officer. They will probably be found in the department that currently deals with Compulsory Competitive Tendering issues. If you find that you do not have one, or get the reply 'What's Best Value?' then it might be a good time to consider a career move!

Steve Garland

Bolton Museum, Art Gallery & Aquarium

Book Review

Surrey Invertebrate Atlas Project

The series of atlases consists of four books to date covering Butterflies, Dragonflies, Moths and Hoverflies. Each book follows the same format consisting of a number of informative clear distribution maps. They all have very good introductions on the Surrey area giving its geology and relating it to the study organisms. The series is an invaluable conservation tool and forms an excellent baseline for all future work.

Butterflies of Surrey-Graham A. Collins

This is the first in the series and is well illustrated. It has a useful section on collecting and the law. It gives an interesting insight into the dynamics of Surrey's butterfly populations, giving reasons for the decline of some species and the increase of others. Distribution maps for all the species occurring in Surrey are given together with habitat notes. All the species resident in Surrey are illustrated with delightful photographs. the only downside of the book is that it is aimed at the butterfly community, it is not very useful if you do not already know your butterflies. I felt it would have been beneficial to include species descriptions, so that the amateur naturalist or interested local people could identify local populations.

Dragon flies of Surrey-Peter Follet

This was a very interesting book and provided a good insight into Dragonflies. It left you feeling that you know what a dragonfly is, what their different habitats are and how to identify them. In the introduction it has a useful breakdown on what species occur in each habitat type and the conservation issues surrounding the sites. As with all books in the series it had excellent illustrations. It gave illustrations of both male and female for all species occurring in the Surrey region. It also gave a very interesting section on fossil dragonflies. Distribution maps and habitats for all species were given.

Larger moths of Surrey-Graham A.Coolins

In the introduction an interesting section on the different moth habitats of Surrey was provided illustrating the vastness of moth diversity in the area, 540 resident moths. It gives the conservation problems in the area and a useful section on how to collect moths. It is unfortunate that not more moths could be illustrated, as it would help local enthusiasts come to terms with the vastness of diversity in their area. Again species descriptions would be invaluable for the casual reader. The plates are arranged in habitat type, which is useful, and larval stages are illustrated for each family.

Hoverflies of Surrey — Roger K. A. Morris

This gives a really useful section on the biology and form of the hoverfly, with clear diagrams to the different parts of the hoverfly anatomy. It explains the specialised habitat requirements of the hoverfly and how they can be used as indicator species. It gives concise descriptions of the different habitat types associated species. It also has a wonderful highlighted section on some of the more interesting sites in the Surrey area to allow the newcomer to hoverfly recording a few interesting days out. There is an encouraging section on recording techniques and biological observations aimed at encouraging more people to take part in the monitoring process. It could have benefited from species descriptions so that people enthused by this brilliant introduction to the hoverfly could fully participate in the monitoring process. It arranges its plates in habitat types and again could benefit from more of these 209 species being illustrated.

Geraldine Reid

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