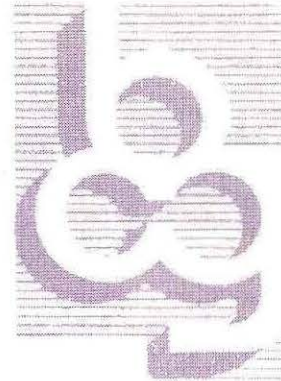


The Biology Curator



The Publication of the Biology Curator's Group

ISSUE 8

MARCH 1997

Diary Dates

Insect Pests in Museums

10-11 March 1997, Natural History Museum, London

A two-day course by David Pinniger covering : pests and damage, pest identification, pest environments, pest monitoring and control, pest management and other topics.

Contact : Phil Ackery, Dept of Entomology, Natural History Museum.

Tele : 0171 938 9346

What's in the Box? - Collection Access and Care

16 and 17 April 1997 at the National Museums & Galleries of Wales, Cardiff

Two-day Joint Conference, with AGMs, between the BCG and Natural Sciences Conservation Group.

Natural Science Curatorial Course

16th - 20th June 1997

Organised by the Department of Museum Studies, University of Leicester and Leicester / Leicestershire Museums. Supported by BCG & GCG.

A practical introduction to working with natural science collections including collecting, recording, identification and enquiries, systematics, preservation, collection care and management.

Contact : Simon Knell, Department of Museum Studies, 105 Princess Road East, University of Leicester, Leicester, LE1 7LG. Tel: 0116 2523963. Fax: 0116 2523960.

e-mail: sjk8@le.ac.uk

Conservation of Natural Science Materials

7th July - 8th August (5 week course)

Certificate in the Care and Conservation of Natural Science Materials

Venue: The Conservation Unit, Department of Earth Sciences, University of Cambridge

Natural Science Collections contain a wide variety of materials of both inorganic and organic origin which are of educational, scientific and economic value. The management and conservation of natural science collections is vitally important to the safe-guarding of this important resource. Natural Science Materials are also found in other areas.

These include ethnography, stone, or textiles collections. This course will therefore appeal to conservators working with similar materials in other collections, such as ethnographic and archaeological conservators, to people responsible for the care of natural science collections, as well as existing natural science conservators.

This 5 week course will cover natural science materials from a modern conservation perspective. It will discuss their treatments in light of approaches to similar materials in other areas of conservation and will also look at traditional methods of preparing and conserving this material. The course will cover the chemistry of these materials, control of deterioration (from both a passive and an active perspective) and collections maintenance.

People who complete the course will have a solid overview of the factors which cause the deterioration of natural science materials and how these collections are maintained and conservation problems can be resolved.

The course will include a large element of hands-on conservation relating to natural science materials.

It is possible to arrange for individuals to take portions of the course.

Contact : Chris Collins, Geological Conservation Unit, Dept. of Earth Sciences, University of Cambridge, Madingley Rise, Madingley Road, Cambridge. CB3 0EZ. tel: +44 1223 362522 fax: +44 1223 366860

Celebration of Bicentennaries of Charles Lyell and James Hutton

30 July - 3 August and 5-9 August 1997.

Contact : Lyell-Hutton Conference Office, Geological Society, Burlington House, London W1V 0JU

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Deadline: All items for next publication to reach Editors by 8th May 1997.

Committee report

BCG committee met on 20.1.97. The meeting was attended by Stephen Blackmore, Chair of the Systematics Forum, and Val Bott, Deputy Director, MGC, and nine committee members. There should have been ten but someone preferred London to Oxford.

Stephen Blackmore gave a brief summary of the Systematics Forum, outlining its background and purpose. It had been set up to develop a strategy with regards to systematics research in the UK, though beyond this the brief is very open ended. It will be for the Forum itself to decide what form of strategy to put forward and what it should cover. It is not expected that it will be a strategy for collections, but the role of collections in systematics research, and their needs will be addressed. Since this activity has been set off by central government and not the museums profession, it is clear that there is potentially a range of useful opportunities being presented. Ideas to your local committee member.

Val Bott gave an outline of the role of MGC in the care of collections, MGCs current activities and her own particular role. MGC will be continuing in its three principle roles of advice, guidelines and advocacy, and are dealing with issues raised in the governments review of the museums world, such as the designation scheme for museums, the AMC review, collaboration between nationals and non-nationals, transfer of museums to trust status, training issues and international relations. MGC has no scientists on its staff and Val will be grateful for good feedback on the issues facing the natural sciences community. She will be seeking to collaborate more closely with groups such as ourselves.

Collections at risk revealed an increasingly gloomy situation. Bristol, Leicester and Passmore Edwards still give considerable cause for concern and we are continuing in our efforts to make the relevant authorities aware of the needs and value of their collections. The situation at Manchester is unknown and it is not clear how Bill Pettitt's vacancy is to be dealt with. At Glasgow, the situation has been made very public but is currently at a standstill, and so it is not clear what result will ensue.

The collections at risk action pack was discussed and the revised form of the policy statement was approved. The various activities decided upon at the last working party meeting were in progress and members would have the opportunity to comment on the results as soon as they were available. However, Mike Palmer has done a great deal of work on this project and we are hopeful that this will result in a significant contribution towards the care of natural history collections in this country.

A brief report on orphan collections was given outlining the present situation. The report and a short accompanying article is printed elsewhere in this issue.

Organisation of the 1997 AGM is proceeding well. There will be a good range of papers, the meeting is being well supported by the NMW and we hope will be well attended by the membership.

The MA Conference session, on the decline of the specialist curator, seems to be very timely, and should be

related to the kinds of events that we are expecting over the next couple of years. A meeting of BCG, GCG and SMA representatives will be organised when all three groups have had their committee meetings, ie. after the end of January.

The next European meeting is hoped to be to Vienna, and some external support will be sought as it is likely to be more than twice the cost of recent trips. Attendance on this trip, as on past trips, is not likely to be confined to BCG members.

The next committee meeting is to be on 5.5.97

Steve Thompson

The BCG/GCG orphan collections working party report

Following this short article is the above mentioned report. It has purposely been kept short, the main part being only three pages long, in order to enable it to be quickly read and understood. This has meant, however, that a great deal covered in the preliminary discussions has had to be left out. I would therefore, like to give some idea of the background to the report.

The report outlines the present situation with regards to those natural science collections that do not, at present, have specialist curators to look after them. There are a range of issues that are directly related to any action that may be carried out on these collections. These include details of the possible courses of action open to institutions, details of an overall strategy, the implications for institutions with such collections, timescales over which work may be carried out, which organisations or types of organisation may need to be involved and, of course, the costs of carrying out the work. As our aim at this stage was simply to state the problem, we felt that these issues should not be included in this report.

As part of the work carried out, two seminars were organised. The first of these was held at the 1994 Museums Association (MA) conference, one result of which was the production of the report itself. The second was held at the 1996 MA conference, and presented the final draft of this report. This was, at least in part, to gauge the reaction to the subject and the report. The result was most encouraging, particularly because of the range of people who attended the seminar and because of the lively discussion that took place in the second half. Although organised by two natural sciences groups (the Biology and Geology Curators Groups), both the attendance and the discussion were marked by a strong, even dominant, presence of non-natural scientists, who furthermore included senior museum and area council personnel. It seems clear that there was a great deal of interest, both in the value of this work to all museum disciplines, as was intended, and in the possibility of a practical strategy to deal with what generally seems to be a ubiquitous and intractable problem in museums.

The next step following publication of the report should be to put together a working party who are able to examine all of the above issues and create a strategy that will address the problems of orphan collections. This will need to include

methodology, options, costings, fundraising and marketing, and no doubt other factors as well. Members of the working party are likely to include representatives from the Museums and Galleries Commission, the Department of National Heritage, the Area Museum Councils, the Biology and Geology Curators Groups, the Natural Sciences Conservation Group, the Collections Research Units, the Museums Association, and perhaps the institutions themselves. It needs to be recognised, however, that the larger the group gets the less effective it is likely to be. The working party might expect to meet two or three times a year, and one could not expect a useful result in less than a year.

One final point, on the subject of names. It has been pointed out that the use of the term orphan is perhaps unwise, especially as the aim to promote the long term care of collections, even where successful, does not necessarily mean they will gain their own specialist curator. It may well be more appropriate, therefore, to drop the term orphan and take the initiative forward from the perspective of putting in place minimum standards of care for collections, across the board, but with particular reference to those that are currently without specialist care at present. And so to the report.

A Report of the BCG / GCG Orphan Collections Working Party

Steve Thompson, Scunthorpe Museum

Introduction

In September 1994, a seminar was organised at the Museums Association (MA) conference, by the Biology Curators' Group (BCG) and Geological Curators' Group (GCG), to address the problem of the many natural science collections in the UK that do not have professionally trained curators.

If collections are uncurated they are effectively inaccessible. The museum loses part of its basic resource while the scientific community loses valuable data. The collections are likely to deteriorate, making them progressively more difficult to bring back into use. The status quo is not being maintained by simply doing nothing.

Among the recommendations made at the 1994 seminar was that a report should be produced to summarise the findings made by a joint working party, with a view to generating activity. This report looks at the extent of the problem, the way it has been tackled so far, the reasons for acting, some possible solutions and, finally, makes a number of recommendations.

Some Standards, Codes and Guidelines

Numerous documents have been published within the last ten years indicating a commitment to the care of all the collections within our museums as part of a national resource and our collective cultural heritage. These include:

Museums Association (MA):

Code of conduct for museum professionals.
Code of practice for museum authorities.

Museums and Galleries Commission (MGC):

Registration scheme.

Guidelines for the care of collections. (Geology, Biology).

Geological Curators' Group:

Guidelines for the care of geological collections.

Museum Documentation Association (MDA):

SPECTRUM.

Collections Research Units:

Regional surveys and reports on natural science collections.

The Value and Valuation of Natural Science Collections

Geological Society.

Why Care

a) Specimens and collections are important even when they lose their curator. Some material (eg. type material) is irreplaceable.

b) All collections, curated or otherwise, are part of a national resource and our national heritage.

c) It is difficult to define the future importance of the material in our care.

e) The ability to use a collection depends on good curation. Owners will attach more importance to a well cared for collection that can be used.

f) The profession has stated a commitment to the national resource of collections by publishing standards, codes and guidelines.

History

The Extent of the Problem

Two reports, "The State and Status of Geological Collections in the UK" (Geol. Soc, 1981) and "Biological Collections UK" (MA, 1987) already provide an overview of the problem. The regional Collections Research Units (CRU's) have also assessed both the extent and the nature of the problems.

Biological Collections UK (MA 1987)

a) 35% of museums with biological collections have no staff trained in biological curation.

b) 1 - 2.5 million specimens are estimated to be without specialist curatorial cover (orphanised).

c) At least 30% of institutions hold type or figured material.

d) Around 50% of orphan collection institutions still receive natural history material.

The peripatetic geology curators for the South East Area Service (1985 - 1995) surveyed all the museums in that region. They found that 1.5 million geological specimens were without curatorial cover and that 186,000 were in need of remedial conservation.

A comprehensive CRU project in the North West found, after surveying 61 institutions with natural science material, that 29 museums had no natural science curator and 4 had no curator / skilled carer at all. This corresponds to roughly 270,000 specimens.

If the North West is a reasonable average for the UK as a whole, but weighting the figures for the SE, we get a national total of around 5 million specimens, with 370,000 in need of remedial conservation.

Past Strategies

Peripatetic curators. These have usually been attached to area museums councils, (AMC's), such as in the North East and South East, and always on a temporary basis.

Volunteers. Many are very competent and committed, but quality cannot be guaranteed if there is no qualified curator to supervise their efforts.

Community programme and work experience schemes draw upon inexperienced people and with little hope of long term commitment. Again proper supervision is required for quality assurance.

Freelance workers. Suitably qualified and experienced people are taken on for a limited period of time, to do very specific tasks, on a one-off basis. This does not cater for the long term needs of the collections but should at least promote the status quo.

A part solution has been for groups such as CRU's to offer advice, allowing museums to put out work without having to be able to put in the initial evaluation effort themselves.

The principle problem with all such schemes has been the lack of consistency, continuity and long term provision for the collections.

Future Solutions

There are many possible options. Many of the attempts so far have been on an individual, independent and ad hoc basis, and it seems apparent that these will not serve as a long term solution to the problems. A more unified regional or national scheme is needed and we feel that the best long-term option is likely to be a major national initiative, though is not the purpose of this report to describe such a scheme.

It is expected that the work would be carried out by existing operators, such as AMC's, CRU's, volunteers, etc, making the initiative an umbrella for many small projects. This should promote the flexibility and adaptability of individual solutions. Any help offered would be conditional on the receiving institution guaranteeing the long term maintenance of the collections. The use of the collections should also be promoted as part of the package.

Ideally, all collections, not just natural science collections, should be catered for. However, natural science represents a more or less self contained set of collections and expertise, is large enough for economies of scale to be significant, but small enough to act as a potential pilot project, to be later developed for other subject areas.

Reasons for a national initiative

1) Greater weight. A 'single' scheme is more likely to gain the support of a wider range of backers, such as MGC, MA, AMC's, CRU's, specialist groups and institutions, as well as being more likely to gain the attention of central government.

2) It acts as a focus for raising the profile and improving the image of the profession.

3) It avoids the splitting of support for initiatives.

4) It has greater marketing potential. Given a name, a logo, objectives, an action plan, etc, it is more likely to attract sponsorship.

5) The network would act as an information gathering and distribution network, perhaps supported by newsletter, and provide a database for marketing and research purposes. Small or remote institutions would find such support particularly helpful.

6) A common scheme would enable the use of national standards and promote consistency of results.

Solutions for individual collections

1) Employ a full time, qualified professional natural science curator. In some instances a good case could be made for this, on the basis of providing a natural science service to the public and realising the full value of the collections.

2) Shared curatorial services. This may come down to a formal agreement between a group of museums to jointly employ a peripatetic curator.

3) Use of freelance workers.

4) Ad hoc and informal use of curators from neighbouring institutions.

5) Programs of voluntary work. These would have to be very well prepared before work began to ensure that useful results were gained from the effort.

6) Transfer of Collections. This is an option that the registration scheme considers, when this represents the best interests of the collection.

Summary and Recommendations

Summary

It is clear that a substantial proportion of our heritage of museum collections is currently in a state of abandonment. Because such collections have no specialist care, they are undervalued, under used and poorly appreciated.

Some of this material is of international importance and much is of regional importance. The piecemeal efforts to protect individual collections, while very worthy, have not made a significant impact on the situation as a whole. If this material is to be protected, a concerted effort on the part of the museum community is needed.

A national scheme, on which individual collections managers will be encouraged to call for help, is likely to be the most effective way of dealing with the larger scale problem.

Recommendations

- 1) That a national scheme be designed that will bring about effective action on orphan collections.
- 2) That a new working party be set up, suitable for bringing this about and putting it into action.

The Working Party

This report was produced, the background work carried out and seminars organised by a working party comprised of the following members:

Chris Collins, Conservation Labs, University of Cambridge

John Cooper, Booth Museum, Brighton

Rosemary Roden, freelance curatorial consultant

Mark Simmons, Perth Museum

Simon Timberlake, South East Museums Service

Steve Thompson, Scunthorpe Museum

References and Further Reading**Biology Curators Group**

Biological Collections UK

Museums Association, 1987

Collections Research Units

Skeletons in the Cupboard: The report of the North West Collections Research Unit.

North West Museums Service, in press.

All the regions have produced a register of natural science collections within the region but these have rarely contained more than a passing reference to the state of the collections, although the information was recorded in the surveys of the collections.

Geology Curators Group

The State and Status of Geological Collections in the UK

Geological Society of London, 1981

Guidelines for the care of Geological Collections

Geological Society of London, 1985

The Value and Valuation of Natural Science Collections; Proceedings of the 1995 International Conference.

Geological Society of London, 1997

(Published on behalf of Geology Curators Group and Biology Curators Group)

Knell, S.J, Taylor, M.A. and Roden, R.

Geology and the Area Museum Service

Area museum Service for South East England, (Now SEMS), 1987

Museums Association

Code of Conduct for People Who Work in Museums

Museums Association, 1997.

Code of Practice for Museum Governing Bodies

Museums Association, 1997.

The above two documents are available free of charge from the Museums Association.

WORLDWIDE WEB SITES

Please send in any favourite sites, useful sites or just plain funny sites of interest to natural science curators.

Roadkill Quarterly - an impressive site, terrific recipes for all those critters once their details have been logged on Recorder! It's at :

<http://www.collideoscope.com/rkq/>

For biodiversity try :

<http://www.biologie.uni-freiburg.de/data/zoology/riede/taxalinks.html>

botany links -

<http://ifs.plants.ox.ac.uk/blinks.htm>

other links pages at the above can be accessed from

<http://ifs.plants.ox.ac.uk>

*Dave Anderson, Natural History Centre,
Towneley Hall Museum, Burnley*

THE HISTORICAL MEDICAL EQUIPMENT SOCIETY

The Society was formed in September 1996 at a meeting of collectors and museum curators, and a steering group was elected under the chairmanship of Mr John Kirkup, FRCS.

The objectives have yet to be finalised, but will include :

- To provide opportunities for meetings to discuss medical instruments and equipment.
- To promote the study of the development of medical equipment from ancient times to the present.
- To provide a forum for discussion between many small specialist groups around the country.
- To publish a newsletter and, in due course, a journal.
- To arrange visits to museums and private collections.

Membership is open to all, including those with special interests in medical, surgical, pharmacy, dental and pathology instruments and equipment.

Expressions of interest are sought from all who share our enthusiasm.

An inaugural meeting is planned for Spring 1997 in London.

The steering group comprises :

Mr John Kirkup (Chairman), Dr David Warren (Secretary), Mrs Sue Weir, Dr Marios Kyriazis, Mr John Maynard.

The address for all correspondence is : The Secretary, 77 Carmarthen Avenue, Portsmouth PO6 2AG. Fax : 01705 201479. E-mail : 101767.2756@compuserve.com

Museums Documentation Association

SPECTRUM: A standard for museum documentation.
Museums Documentation Association, 1994.

Museums and Galleries Commission

A Registration Scheme for Museums, Phases 1 and 2.
Museums and Galleries Commission, 1988, 1995.
Guidelines in the Care of Biological Collections
Museums and Galleries Commission, 1992.
Guidelines in the Care of Geological Collections
Museums and Galleries Commission, 1993.

Simmons, M

Discovering Green Treasures
North of England Museums Service, 1993.

Timberlake, S.

A preliminary Report of the Travelling Geology Curator
Area museum Service for South East England, (Now SEMS), 1987.
The Interim report of the travelling Geology Curator
Area museum Service for South East England, (Now SEMS), 1989.

BIOLOGICAL RECORDING CELL REPORT

Steve Garland - Bolton Museum, Art Gallery & Aquarium

The Millennium bid has unfortunately failed, as announced to the bid team on the 4th of February. Every BCG member should have received a copy of the latest summary of the LRC section. In the period up to then, most records centres have taken the opportunity to discuss possible consortium structures with other organisations. Rather than establishing new stand-alone LRCs in each county, most seem to be looking at networking existing resources. Now that the Millennium Bid is no more, it is up to organisations such as the BCG and NFBR to try to develop some of the ideas further.

The Internet is still a rather slow and unreliable way of networking information, but the continuing development of better telephone lines (including ISDN links), faster modems and faster computers will result in steady improvements. The political implications of establishing new LRCs or centralising existing resources are significant. The key to the successful development of biological recording nationally is networking at a local and national level. A major benefit of a successful bid would have been the addressing of universal problems relating to such things as Data Quality, Copyright, Accreditation Standards, standards for access to data, charging policies and software compatibility. These are still vitally important issues which will need resolving before any real national or regional networking can take place.

Local Agenda 21 and Biodiversity issues are a strong lever to support LRCs. In the North West of England there are discussions continuing at several levels about how to approach biodiversity. Many Boroughs are developing Biodiversity Action Plans (BAPs), but most are realising that a county or regional perspective is necessary for many aspects. Most counties are approaching BAPs at that level, but a North West Biodiversity Steering Group has been formed to take a regional view. This will be especially important for organisms which are poorly known. It may be impossible to assemble meaningful data at a county or borough level. Everyone is quickly realising that LRCs provide the best hope of collating the vast quantities of data needed. BAPs are not a 'one-off' thing, but require monitoring and adapting continuously. LRCs are vital for this development and should capitalise on the opportunities presented. Co-ordination of LRCs and national data sets would help to provide a complete picture of the current knowledge of our fauna and flora.

The BCG meeting in Nottingham was well attended and a number of interesting presentations examined biological recording and its relationship with collections. Graham Walley will present more details in the next Biology Curator. BCG will be working with NFBR to drive forward several museum LRC interests. The meeting agreed a resolution for BCG and NFBR to pursue creation of an Advisory Board to supervise Biological Recording - more on these developments in future issues.

If you are discussing developments in your county, please let me know what is happening; even if it is just a short letter, fax or e-mail. I want to try to develop a clear picture of museum LRCs and developments nationally. In the North West we have set up a NW Recorder User Group, which already seems to be discussing issues wider than just the use of Recorder. Has anyone else done the same thing?

Although there will be no Millennium funding, I think that the excitement that the Bid generated in the field of biological recording must be harnessed to ensure the future development of a national network, by some means.

BRISC

BIOLOGICAL RECORDING IN SCOTLAND CAMPAIGN

FROM David Mellor, Chair of BRISC.

Dear Pals

Following the news of the NBM bid's demise and taking into account our organisation's desires to be treated as (more) equal partners in any future initiatives I am writing to make the following points.

1. Between them, our organisations contain a substantial, if not complete, representation of LRCs. It is essential that we collectively help to catalyse the formation of an organisation that does properly represent LRCs as soon as constitutionally possible. This point has been endorsed by BRISC and, I think, by the membership of the other organisations. The role of the CCBP should be examined as part of this.

2. If the NBN project is to be pursued, then significant changes need to be made to its design and the way it is administered to take into account the weaknesses of the previous bid. These include the poor (as far as I know) degree of consultation with Local Authority structures; the difficulties that the proposed monolithic development process would cause to ineligible existing LRCs; the absence of any direct LRC representation on the consortium; the almost complete lack of discussion about other elements of the bid.

3. The 'Consortium' is obviously a wider organisation with a developmental role and the consortium's bid was obviously much wider than just LRCs. Any continuing consortium-like organisation should continue to have a wider membership and if possible retain a wider remit. However, I think that we should be prepared to *insist* that proper representation is given to LRCs on an equal basis to other partners on any such organisation. The arguments deployed against this, that we do not have any money to put on the table, nor any significant human resources to contribute are insufficient. What we do have is accumulated experience and expertise. We have, indeed we are, the existing system on which any future growth must be founded. The recognition of this fundamental did not seem entirely clear from the NBN documentation.

4. I understand that an LRC advisory sub-group is scheduled to meet on 18th February at which the attendance of A. M. Smout (BRISC) and yourselves is planned. This meeting may be rescheduled in view of the bid's failure, whenever it happens I think the points above should be discussed.

5. The real decisions will be made at the next full consortium meeting whenever that is. Assuming we all agree, then I propose that we attempt to persuade the Consortium immediately to open up that meeting to the rest of us to that and make our case there as well. If we are accepted then all well and good, if rejected, then at least the situation will be clarified.

6. There is a 'window of opportunity' here to salvage the useful aspects of the bid and to try and add to it our own contributions. It means recognising a short if unspecified timescale over the next couple of months and putting our efforts in together as early as possible. BRISC has a small amount of money to help finance any meetings and associated travel. I'm sure the BCG and NFBR are in even better circumstances. We have a worker who could be called on to do any contacting/organising.

**Cramond House, Kirk Cramond, Cramond Glebe Road,
Edinburgh EH4 6NS**

Tel: 031 312 7765. Fax: 031 312 8705

PLANT COLLECTIONS FOR NON-BOTANISTS WORKSHOP PART 2

The following continues the report on the above workshop held at Liverpool Museum on 26th February 1996. This section covers the practical session on non-vascular plants, fungi and economic botany. As already mentioned in the last issue of the Biological Curator these sessions were run on an informal question and answer basis. The write-ups, therefore,

are based on information sheets or retrospective reviews by the demonstrators concerned. If you require further information or clarification I am assured that all the demonstrators named here are more than happy to be contacted.

Mike Palmer

CURATION OF FUNGI

Demonstrated by Dr Brian Spooner, Royal Botanic Gardens, Kew.

Fungi represent a special group which is handled in many ways differently from flowering plants. The Kew system has evolved over many years but is not necessarily the only system. It could be altered and adapted to local requirements.

What are fungi?

They are a huge and extremely diverse group of vast ecological and economic importance world-wide and still very poorly known. It is estimated that perhaps only 5% of fungi are yet described and that as many as 1.6 million species exist.

They were previously curated as Cryptogams, including all groups of non-flowering plants, fungi & lichens, myxomycetes, mosses and liverworts. This is an artificial assemblage of unrelated taxa. Fungi are a Kingdom in their own right and this does not include myxomycetes although myxos are traditionally considered as fungi and are usually maintained in mycological herbaria.

Curation

A curatorial system for such a huge group needs to be user-friendly, i.e. species and specimens to be located easily, and to provide information on taxonomy. It is, therefore, useful if related taxa are housed together: this reflects taxonomic opinion and, in practice, can facilitate identifications.

Until recently, Kew based its curation of the fungal herbarium on Saccardo. He compiled, in 25 volumes 1882 - 1931, a descriptive catalogue of all fungi. These were arranged according to an artificial, though practically useful, system based largely on colour and septation of spores, form of fruitbody etc., and each fungus was numbered. The first 11 volumes provide the main compilation complete with index. Later volumes contained new species, each given a new number, i.e. not following on from the numbers previously applied to that group. A recent index to all volumes has been published. Saccardo was continued by Petrak to 1939, then by International Mycological Institute's (IMI) Index of Fungi, ongoing listing all new taxa, and published twice a year.

Kew maintained a system using Saccardo classification and numbers as in vols. 1 - 11. Species described subsequently were maintained in alphabetical sequence as an addenda. This was eventually unwieldy as the addenda was often large, confusing to visitors, and in no way reflecting modern taxonomy. In recent years the herbarium has been recurated and a numbered classification introduced. This has also allowed expansion of the herbarium.

Other systems

Alphabetical arrangements of all taxa within major groups are used by many major herbaria, including IMI. Specimens are easier to locate but no indication of taxonomic relationships is given and related species cannot be readily found.

Anamorphs:

Fungi often have two or more spore-producing stages. They are classified by their sexual stage (teleomorph), but often have one or more asexual stages (anamorphs). At Kew these are maintained in a separate sequence, as many anamorphic fungi are not linked to teleomorphs. In some herbaria anamorphs are kept under teleomorph names, but this is inconvenient and gives a misleading picture of what teleomorph material is available.

Kew system

Our classification is based on modern taxonomic opinion, modified where necessary. It is a numbered hierarchical classification so that each genus can be easily located and related taxa are together. This is indexed with an alphabetical list of genera, on computer and as a printout which is constantly updated as new taxa are accessed or to reflect taxonomic changes. Species are stored in alphabetical sequence within the genera as it is usually impossible for fungi to arrange them in systematic order as they are too poorly understood. In ascomycetes genera are also stored alphabetically within their families as again they are too poorly understood to create at present a meaningful systematic sequence.

This system currently recognises 95 orders, 400 families and over 7000 genera.

Additional taxa:

New species are placed into the alphabetical sequence. Unnamed species are placed at the end of the genus. New genera or families being introduced to the system will need a number and a letter appended unless the entire sequence is re-numbered.

Sub-sequences**Geographical:**

For species with a wide distribution this is a valuable subdivision so that distribution can be readily determined, and individual collections from certain areas more readily located. This can be done for all if required, but many are restricted in distribution or represented by few collections so that it may not be practically useful.

Hosts:

For plant parasites in particular it is important to have a host-based sequence. This allows rapid identification of fungi, many of which are extremely host-specific, and host data can be readily extracted. This can link also with a geographical arrangement. This system is of particular value for rusts and smuts, and powdery mildews, which are commonly host specific. This should be linked with a species index so that species can be rapidly located. It is also useful

for large and difficult genera such as *Mollisia* as a help for identification and to understand host ranges of species. Can be done in general terms such as 'spp. on herbaceous dicot. stems', 'spp. on dicot. leaves', 'spp. on graminicolous hosts', 'spp. on non-graminicolous monocots.' etc.

LICHENS

Demonstrated by Patricia Francis, Keeper of Natural History, Bolton Museum and Art Gallery

A wide variety of specimens were displayed :

- 1) Recently collected field specimens with field notes.
- 2) Recently curated specimens stored in pre-cut, ready-to-fold packets (fragment packets) with printed data labels.

All papers used being acid-free.

3) Historical specimens from the herbarium prepared in a variety of ways :

- a) Specimens glued directly onto small herbarium sheets
- b) Specimens in paper packets
- c) Specimens in paper packets, the packets glued onto small herbarium sheets
- d) Specimens glued onto postcard sized card mounts
- e) Specimens glued onto smaller sized card mounts

The historical specimens were previously stored in taxonomic order in card binders tied with ribbon, each binder holding up to 75 specimens. The binders were then sequentially stored in card boxes.

This method of storage made it very difficult and time-consuming to find individual specimens. It was also problematical trying to add recently collected material to the collection.

A new storage solution was needed to improve access to the collection. The historical specimens are being progressively redetermined and when they return to the museum are being stored using the following methods :

A piece of acid-free card is cut to the maximum size of the mounted specimen. A new data label is attached to the front of the card and all the specimen data are repeated on this label. The card then protects both the specimen and old mount from abrasion when the whole is slid into a marginally larger sized plastic bag. The new data label can then be read clearly through the plastic. The end of the bag remains open to prevent condensation. Using this method the specimens can be stored vertically in metal drawers of office index cabinets.

Particularly bulky specimens or very delicate specimens not suited to the above storage method are stored in individual acid-free boxes with clear acetate lids.

The specimens are arranged in alphabetic order by genus name as in Purvis, O.W., Coppins, B.J. & James, P.W. (1993) *Checklist of Lichens of Great Britain & Ireland*, British Lichen Society.

Many of these newly-curated, historical specimens were also displayed.

BRYOPHYTES

Demonstrated by John Lowell (text by Dr Sean Edwards), The Manchester Museum.

Brief Notes for Use in Collecting and Examining Bryophytes.

- **THE GREATEST THREAT TO RARE OR UNUSUAL PLANTS IS THE ACQUISITIVE BOTANIST.**

If you must collect, then always collect with a guilty conscience, and remember that a small tuft of moss may contain hundreds of plants.

- Select good representatives of the species. Look and think before just grabbing a handful. Look for:

ripe fruit,

sex organs (maybe on separate plants if dioecious),

gemmae (foliar, or rhizoidal in soil),

variation in habit.

But just take, for example, a couple of selected capsules, if sparsely fruiting.

- Place each collection separately in its own collecting vessel (plastic bag, tin, or folded newspaper if not too moist), and add your collector's number indelibly to each collection. Make notes against corresponding number in field note-book, which must always be retained. **DO NOT RELY UPON MEMORY.** Collector's numbers, e.g. Fred Smith 243 should form one sequence only, for your lifetime, to prevent any ambiguity.

- Air-dry collections as soon as possible (but never separate from numbers), and then transfer to herbarium packets. These can be bought, or made from folded acid-free paper, but even manila envelopes will do. Keep to uniform size for filing (many bryologists use a shoe-box herbarium!). Immediately transfer collector's number, plus other data, to packet, leaving space for plant name (if not known) along top edge for easy access.

- **EXAMINATION.** Most air-dried bryophytes moisten out very well for examination. A little wetting agent (e.g. detergent) may help, and heat is needed only for the most recalcitrant material. Take only the smallest amount (just part of a shoot) for examination, and place in a water-drop on microscope slide.

- Return moistened material (blotting dry is sufficient for small fragments) in a separate packet rather than replacing it with the main bulk in the original packet. Conventionally, triangular packets are used for this so that examined material is readily distinguished.

- Leaves are best removed by pulling downwards with fine forceps. Make as complete a dissection as possible (e.g. sections if necessary) before examining microscopically. Note that stem and branch leaves may differ. Place leaves (both ways up) and sections etc. in small (don't flood) drop of water on a clean slide, and gently cover with cover-slip. A bit of careful preparation saves messing about later when half way through the identification key.

- Do make notes and illustrations. Always mark notes with collector's name and collection number for specimen, to save further unnecessary dissection. Some people make notes etc. on index cards that can be kept with packets. If

you use a note book, keep notes on different collections clearly separated.

- Packets are conveniently stored in drawers like a card index. Many herbaria have only traditional cupboard space in which case packets can be glued on standard-sized herbarium sheets and kept in folders (like flowering plants), typically 8 - 20 packets per sheet.

GUIDELINES FOR PRESSING ALGAE

Demonstrated by Rob Huxley, Head of Curation Division, Dept. Botany (text by Rob Huxley & Jenny Moore, Curator of Algae) N.H.M. London.

Equipment

- Archival-quality rigid mounting paper - cut up to appropriate sizes
- Shallow dish (c. 8cm depth) e.g. photographic developing tray
- Non-woven gauze like fabric e.g. fine muslin, old tights and stockings, medical gauze
- Metal gauze sheet
- Plant press with drying paper and corrugates
- Small soft paint brush, mounted needle, forceps, pencil

Method

1. Dried herbarium specimens can be made from liquid preserved or freshly collected material. Float the individual specimens in a shallow tray containing about 4 cm depth of water (preferably sea water for marine algae).
2. Cut mounting paper to size and annotate one corner (use pencil or waterproof Indian-ink) with enough data to distinguish the specimen. A reference number or date and locality should be sufficient.
3. Slide the paper into the water under the specimen and gradually raise (one end first) the sheet supporting the specimen and allowing the water to run off. Arrange the fronds and branches with small paint brush as draining takes place (using perforated metal sheet to support the paper as it emerges if necessary). Leave some branches clumped together to allow easier removal for subsequent examination. Clumped material suffers less damage than that pressed directly onto the paper.
4. After excess water has drained away, place the sheet on several thicknesses of drying paper (or newspaper) in a plant press, covering the plant with the fine gauze. This material will prevent the specimen from sticking to the upper sheet of drying paper.
5. Several specimens can be placed side by side on the drying paper, provided that they do not overlap. Lay several sheets of drying paper over one layer of specimens before starting another layer.
6. Repeat procedures 1-5 until the press is full, inserting a corrugate between the drying paper at regular intervals to ensure ventilation. The average full press should have about six ventilation levels.

7. Fasten straps around press frames reasonably, but not excessively, tightly. Ideal drying is in a stream of warm air, if this is available. A box heated by a couple of light bulbs will provide enough heat. **Excess heat may effect the material's usefulness for chemical analysis.**
8. Replace all drying paper after 1-2 days and again after 5 days. (First change may need to be earlier if drying conditions are poor). At any change, remove completely dry specimens and refasten straps. If a second press is available, it is useful to have the almost dry material in a different press. **Never remove nylon fabric until specimen is entirely dry and removed from press.**
9. Dried specimens are ready for mounting onto herbarium sheets in the usual way. Extra gluing and strapping of branches may be necessary.

Liquid preserved material

- Small specimens and collections representative of one habitat type at one locality are often better liquid preserved than pressed. Polythene bottles are the best containers for collection and transit, but make sure screw tops are correctly and tightly fastened.

SLIDE MOUNTING DIATOMS

Demonstrated by Karen Webb, Curator of Diatoms, N.H.M. London

Make sure that the pH of the cleaned sample is neutral by testing it with litmus paper. If the sample is acidic, wash it with distilled water again.

For a strewn slide, use a clean drinking straw onto a clean coverslip. This strew either can be air dried in a dust free place, or on a warm hot plate. Make sure that the hot plate is only warm, if the sample boils it may cause spitting and loss of specimen.

Place a drop of Naphrax in the centre of a clean slide and place the strewn coverslip upside-down on top of the drop. In a fume cabinet, gently warm the slide either on a warm hot plate or over a small spirit burner. Take care not to heat the slide too much or the mountant will boil furiously, causing the coverslip to crash up and down on the specimens, possibly breaking them. Also, if the slide itself gets too hot it will explode!

When all of the Toluene has been driven off the slide will set hard as it cools. The length of time that this takes depends on the amount of Naphrax on the slide and the temperature at which you are curing it.

For a selected slide, cast the strew with a clean drinking straw onto a piece of mica. Dry in the same way as a strewn coverslip.

Under a binocular microscope, using either a pigs eyelash mounted on a dowel, a drawn glass filament, or a micro-manipulator, pick clean specimens up from the mica and transfer them to a clean piece of mica with a grid scratched on it. This will enable you to "shape-sort" the diatoms and also to find them again when you come to mount them.

When you have selected enough specimens, put the grid to one side, in a dust free place.

Take a clean slide and place an ink spot in the middle, make sure you turn the slide over so that the spot is on the bottom of the slide.

Take a clean coverslip and place it on a clean slide with a drop of water to hold it in place. Put the slide on a ringing table and spin the table to make sure that the coverslip is central. Load a tiny brush with Indian ink (any colour), spin the table and introduce the brush to the coverslip gently; keep the brush on the coverslip until a perfect circle has been drawn with the ink. This will take a while to perfect; be patient, you should be able to get good results after a couple of attempts. Once you have mastered the technique, you will never forget how to do it! Place the coverslip to one side to dry.

Place the spotted slide under the microscope and focus on the spot, pull the focus so that you are now looking at the top surface of the slide. With a small paint brush, place a tiny amount of diatom adhesive on the slide over the ink spot to ensure it is in the centre. If you are using gum tragacanth, leave it to dry. If you are using diatom adhesive, try to remove as much as possible with a paintbrush, keeping the area as dust free as possible (you only need the tiniest amount).

By whichever method you are using, pick up the diatoms from the mica grid and place them in the arrangement you wish, in the adhesive. You may find it best to get all of the specimens safely onto the slide before you start to move them around.

Once you have the diatoms where you want them, cure the adhesive.

Gum tragacanth

Gently "huff" on the slide (as if steaming glasses to clean them). Your warm, moist breath will adhere the specimens to the slide.

Diatom adhesive

Gently warm the slide over the spirit burner, when the adhesive cures it will send off a small puff of blue-grey smoke. Leave the slide to cool.

Place a small amount of Naphrax on the ringed side of the coverslip and turn the slip upside down onto the slide, sandwiching the mountant between the slide and the coverslip. Cure the Naphrax in the usual way, either over a spirit burner or on a warm hotplate. Leave the slide to cool.

Slide Mounting Samples of Large Algae

Karo is the brand name of a water soluble corn syrup, which is used for mounting permanent slides of small pieces of algae for examination under the microscope. It is available from the larger specialist food shops or in the USA or Canada.

To prepare the specimen for mounting, a small sample of it should be taken, washed in sea water or freshwater and kept wet until ready for mounting.

The Karo should be diluted to a 50:50 solution with tap water and a few drops of formalin which is added to prevent fungal attack of the preparation.

Place a small amount of the mountant on a clean microscope slide and put the sample into it. Gently lower a clean coverslip onto the slide and leave to air dry.

As the Karo mountant dries, it will shrink away from the edges of the coverslip, bleed more solution under the coverslip with a clean Pasteur pipette.

The Karo will eventually set hard over a number of days. There may be a problem with the introduction of air bubbles into the mountant when the extra mountant is bled under the coverslip. This appears to be unavoidable because we have not found a way of preventing it.

When the mountant is set, wipe any excess mountant away from the coverslip with a damp tissue.

Mounting of Pollen Samples

The pollen sample should first be cleaned (details available) and suspended in 50% glycerol solution, in a centrifuge tube.

Centrifuge the sample at approximately 3000 rpm for 3 minutes and decant off the liquid.

Mix glycerine jelly with a small amount of phenol.

Take a subsample of the prepared pollen and mix with a small amount of the glycerine jelly. Place the sample on a microscope slide which has been cleaned with alcohol, and put two small pieces of plasticene on the slide, one either side of the sample. Gently warm the sample to melt the glycerine jelly then stir the sample with a needle, to disperse the specimens.

Gently lower a clean coverslip onto the sample so that it is supported by the plasticene. Bleed melted paraffin wax under the coverslip to seal the slide. When the wax has cooled and set, it will support the coverslip and stop it from crushing the specimens, but the plasticene stays in place.

ECONOMIC BOTANY AND TIMBER COLLECTIONS

Demonstrated by Dr A.S. Gunn, Department of Botany, Liverpool Museum, National Museums and Galleries on Merseyside, William Brown Street, Liverpool L3 8EN.

The system of drawers for the storage of economic botany items, including timbers, used at Liverpool was demonstrated. The system, based on engineering type metal cabinets has drawers which can be flexibly sub-divided. The economic botany specimens are stored in the drawer compartments in their original packaging. Plastazote packing wedges are used to prevent items such as glass vials from moving when the drawers are open or closed. Many specimens are held in old glass-topped display boxes which are deteriorating and these are being rehoused into acid-free cardboard boxes. Ideally some of the material could be stored in clear, air-tight plastic boxes but the cost involved prevent this being applied for all the items in the collection at the moment. The possibility of transferring items stored in polythene packets which are beginning to degrade into polyester packets was also discussed.

THE NATURAL HISTORY MUSEUM COLLECTION OF *ORNITHOPTERA* (BIRDWING) BUTTERFLIES (LEPIDOPTERA: PAPILIONIDAE).

by Phillip R. Ackery

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Synopsis

A brief outline is given of the *Ornithoptera* butterflies, with particular attention to The Natural History Museum's collection of these exquisite insects, how this collection was accumulated, and its present state in terms of curation and information recall. A number of individual specimens of special historical interest are highlighted.

The Birdwing Butterflies — an introduction

In the world of butterflies the Birdwings occupy a position comparable with the Birds of Paradise in Ornithology — a combination of history, romance and beauty gives them unrivalled status within the Lepidoptera. They belong to the Swallowtail family, the Papilionidae, a mainly tropical grouping of some 600 often spectacular species. Conventionally, the Birdwings have been divided into three genera, the smallest, *Trogonoptera*, contains just two species, eighteen species belong to *Troides*, while the twelve most dramatic species of all make up *Ornithoptera*, the primary subject of this article.

Ornithoptera ranges from the Moluccas to the Solomons and southwards into Australia (Queensland). With eight species, the island of New Guinea has the richest *Ornithoptera* fauna. Seven species (*alexandrae*, *rothschildi*, *goliath*, *chimaera*, *tithonus*, *meridionalis*, *paradisea*) are found only in the island of New Guinea; another, *O. victoriae*, is endemic to the Solomons (plus Bougainville, which is politically part of Papua New Guinea). The remaining four species belong to the *priamus* complex — *aesacus* from Obi island, *croesus* from the islands of Batjan, Halmahera and Ternate, *urvillianus* from the Bismarck Archipelago (but not New Britain), and *priamus* itself ranging from the Indonesian islands of Seram and Ambon through New Guinea and northern Australia to New Britain.

Why, then, are these butterflies so attractive to the acquisitive collector? Well, they certainly have measurable status as the largest butterflies in the world, and the female of Queen Alexandra's Birdwing, *O. alexandrae*, is the largest of all with a wingspan reaching 260 mm. Females are quite sombre, especially when compared to the males in which either green, gold or blue invariably contrasts against a rich black background. They are surely the most dramatic of all butterflies. The Birdwings also have powerful historical associations, both with classic insect hunters of the 19th and early 20th century, and with the great private collections built up at the same time. And, rarely for insects, some individual specimens have achieved fame as 'museum objects' in their own right. This level of interest has generated a large and exquisitely illustrated literature, notably the early works of Rippon (1889-1907) and Jordan (1908), and more recently

D'Abrera (1975), Haugum & Low (1978-9; 1982-5), Igarashi (1979) and Ohya (1983).

In some parts of their ranges, *Ornithoptera* species are doubtless already seriously endangered. However, some, such as *O. victoriae*, *goliath* and *priamus*, appear to be common, at least locally (Collins & Morris, 1985; Parsons, 1992a). Only *O. alexandrae* is classified as endangered (see also Sands, 1996). The Convention on International Trade in Endangered Species (CITES) restricts the 'market' for these butterflies, with *O. alexandrae* Appendix-I listed (all trade banned) and all other Birdwings Appendix-II listed (trade monitored with permits required from countries of origin and entry). Parsons (1992a) suggests that this is more emotional than rational with at least four *Ornithoptera* species sufficiently common to not justify CITES ranking. A glance through such journals as *Insektenbörse* indicates that Birdwing specimens are still commercially available. Indeed, proposals have been made for economic utilisation of *Ornithoptera* specifically for commerce (e.g. Parsons, 1992b). So, almost uniquely among the Lepidoptera, restrictions on availability, together with mystique and traditions, have given the *Ornithoptera* an aura of desirability and real fiscal value. This necessitates a level of museum security otherwise seldom considered for entomological collections.

The Natural History Museum *Ornithoptera* Collection

The Natural History Museum, London (still known under its international abbreviation BMNH) has some 3,000 *Ornithoptera* specimens, stored in nearly 200 former Rothschild collection drawers. Drawers of this design are glazed both top and bottom, so with the butterflies pinned (and cross-pinned) into narrow slats, both the upper and underside of wings can be viewed without direct handling of the specimens themselves. For now, the drawers remain in original, gently deteriorating Rothschild cabinets. But with ever-increasing concerns regarding the vulnerability of insect collections to pest infestation it is hoped that the current drawers will soon be re-housed in modern pest-proof metal cabinets. At present, taxa-level recall is by card index down to infrasubspecies. Although *Ornithoptera* only contains some 12 species, the infraspecific variation in pattern is such that sub-species and forms have been described with great zeal — about 200 species-group, form and variety names are associated with the genus. All these names together with related information should shortly be available in computerised form as part of an on-going project involving the input of all such data relating to the BMNH holdings of Papilionidae and Pieridae.

The lay-out of the Birdwing collection has changed little since the early 1970s when Mr. T. G. Howarth amalgamated all the BMNH Birdwing material into a coherent series; at the same time, the types of the group held in the BMNH were meticulously catalogued (Howarth, 1977). Since then, few changes have been made beyond those necessitated by the incorporation of some important new acquisitions, principally the collections of the late Mr Andrew Low and Mr Alan Sharman. The primary series contains most of the material, arranged in a geographical sequence within sub-species and species. Specimens with little associated data, and some with

duplicate data, are stored in a relatively small Supplementary Collection.

Current collection security measures require that there is no unsupervised access to the Birdwing collections. To further restrict availability, the collection is held under a unique key. Even so, abused 'trust' has resulted in one known security breach since the collection was laid out. So, an annual audit has been set in place. This is quite straightforward as the individual specimens are now each labelled with a unique sequential number that can be readily seen. The number itself relates to the Entomological Department's central database that contains all information pertinent to each particular specimen — determination, type status where applicable, locality data, origins, drawer number. And it is this information that provides the basis for the brief sketches given below.

Collection Origins

Of the 3 million or so butterflies in the BMNH collections about one-third originate from the Rothschild Bequest, one-third from other major private collections (including the Oberthür, Levick, Fruhstorfer and Joicey collections) and one-third from a multitude of lesser donations and purchases acquired largely over the last 150 years. The *Ornithoptera* depart slightly from this general profile. Of the 3,000 specimens, 1,322 originated from the Rothschild Bequest, 737 from other major collections, with most of the remainder from well-known lesser sources (Godman-Salvin Collection, Adams Bequest, Rait-Smith Bequest etc.).

Between 1927, with the purchase of a substantial part of the Oberthür Collection, and 1941, when the Levick collection was bequeathed, the BMNH acquired something like 60% of its present butterfly holdings. More than anything else, this was probably due to the influence of Lionel Walter Rothschild, a Trustee of the British Museum (Natural History) from 1899 until 1939, and Norman Riley, two outstanding personalities of the butterfly world. N. D. Riley was Head of the Entomological Department from 1932 until 1955; he joined the staff in 1911 and was still actively associated with the Department until shortly before his death in 1979. Individually they would have been formidable — acting in tandem irresistible! A brief outline of some of these outstanding acquisitions, and the *Ornithoptera* contained in them, is given below.

The Rothschild Bequest contains perhaps some 2.25 million Lepidoptera (registered as "BM (Ent.) 1939-1"), mostly Macrolepidoptera, of which perhaps 900,000 are butterflies. Shortly before his death in 1937, Lord Rothschild signed a memorandum offering his private museum and collections to the Trustees of the British Museum (Natural History), to whom the Bequest ultimately passed. Although specimens of a few lepidopterous groups were quite rapidly assimilated into the BMNH collections, it was not until 1971 that the major part of the collection was even accommodated in the Entomological Department at South Kensington. Specimens originating from Rothschild's *Ornithoptera* collection, some 45% of the BMNH's total holdings of the genus, include important type material, often of taxa described by Rothschild himself in the Tring Museum journal *Novitates Zoologicae*. Of the currently recognised species, Rothschild described

alexandrae, *chimaera* and *meridionalis*, as well as the celebrated 'Ornithoptera allottei', now generally regarded as a hybrid *priamus* × *victoriae*.

Perhaps Rothschild's most renowned collector of Birdwings was A. S. Meek (1871-1943). Meek's writings, notably *A Naturalist in Cannibal Land* (Meek, 1913), suggest a formidable character well able to endure personal hardship. This is graphically illustrated in published extracts from his personal correspondence with Lord Rothschild detailing the adversities surrounding the capture of the first known male of *O. chimaera* (Rothschild & Jordan, 1905). In addition, Meek captured one of the most famed Birdwing specimens, the female holotype of *O. alexandrae* discussed below.

The J. J. Joicey Collection rivals the Rothschild Bequest in terms of coverage, if not actual specimen numbers. Although far less widely known than Rothschild, Joicey also established a private museum, at Witley in Surrey. During 20 years, he amassed a considerable collection of some 400,000 Lepidoptera specimens, excluding 75,000 generously donated to the BMNH during his lifetime. The Bequest ("BM (Ent.) 1934-120") included almost 10% of the current BMNH holdings of *Ornithoptera*. Joicey's best-known collectors of Birdwings were the family Pratt — the patrician and wonderfully named Antwerp Edgar Pratt (author of *Two Years among New Guinea Cannibals*, 1906, a graphic account of his collecting experiences), and his sons, Charles, Felix, Harry and Joseph. After initially visiting South America (1912), family members in various combinations concentrated efforts on the New Guinean subregion. In 1913-14, they stayed for several months in Irian Jaya, principally the Arfak Mountains, and in Waigeu and the Schouten Islands, and in 1919-21 visited Seram, the Weyland mountains of Irian Jaya and Mefor island, before venturing on to Sumatra in 1921 and Buru in 1922. Their accumulated specimens include type material of various taxa described by Joicey in co-authorship with either G. Talbot or N. Noakes, most notably subspecies of such choice *Ornithoptera* species as *chimaera*, *paradisea*, *meridionalis* and *tithonus*.

Charles Oberthür (1845-1924) lived at Rennes in Brittany. His interest in Lepidoptera, and the expertise available to him through the family firm of printers, happily combined in the production of two finely illustrated lepidopterological journals, *Études d'Entomologie* and *Études de Lepidopterologie comparée*. Upon his death in 1924, various parts of his collection were acquired by a range of authorities — many of the *Ornithoptera* passed to John Levick, a private British collector. The substantial material that came directly to the BMNH included very few Birdwings ("Bm (Ent.) 1927-3"; Norman Riley, 1927, gives an entertaining account of the logistics involved in moving 750,000 Lepidoptera from Brittany to South Kensington!). It was not until 1941 that the Levick Bequest ("BM (Ent.) 1941-83") passed to the BMNH, and with it 269 *Ornithoptera*, mostly former Oberthür specimens. John Levick seems to have become a somewhat shadowy figure in comparison to Joicey, Riley, Rothschild and Jordan. But correspondence held in BMNH archives suggest he played a significant role in Museum's acquisition of various important collections.

Personalities and Specimens

Alfred Russel Wallace was a contemporary and associate of both Henry Walter Bates (with whom he travelled in South America) and Charles Darwin, his co-author of the classic paper on the theory of evolution read at the Linnean Society in 1858. Of Wallace's huge output of publications, two major works, *The Geographical Distribution of Animals* (Wallace, 1876) and *Island Life* (Wallace, 1880) guaranteed a pre-eminence in the field of Biogeography recognised still in the 'Wallace Line', the famous supposed boundary that he identified between the Australian and Asian faunas.

Perhaps more than anything else, one wonderfully evocative paragraph accounts for Wallace's association with the Birdwing butterflies. He was on Aru Island in the Moluccas when he wrote "The next two days were so wet and windy that there was no going out; but on the succeeding one the sun shone brightly, and I had the good fortune to capture one of the most magnificent insects the world contains, the great bird-winged butterfly, *Ornithoptera poseidon* [now treated as a *priamus* subspecies]. I trembled with excitement as I saw it coming majestically towards me, and could hardly believe I had really succeeded in my stroke till I had taken it out of the net and was gazing, lost in admiration, at the velvet black and brilliant green of its wings, seven inches across, its golden body, and crimson breast. It is true that I had seen similar insects in cabinets at home, but it is quite another thing to capture such one's self — to feel it struggling between one's fingers, and to gaze upon its fresh and living beauty, a bright gem shining out amid the silent gloom of a dark and tangled forest. The village of Dobbo held that evening at least one contented man" (Wallace, 1869). The passage suggests a tranquility missing from his account of capturing *Ornithoptera priamus croesus* — "on taking it out of my net and opening the glorious wings, my heart began to beat violently, the blood rushed to my head, and I felt much more like fainting than I have done when in apprehension of immediate death. I had a headache for the rest of the day, so great was the excitement produced. . . .".

In the preface to the 10th edition of *The Malay Archipelago* Wallace (1890) declares that his complete collections of birds and butterflies were, by then, in the British Museum. This is difficult to reconcile with the source information of the known Wallace *Ornithoptera* in the Natural History Museum collections. None of this material seems to have been presented directly by Wallace — all of it comes from secondary sources, and after 1890 when Wallace wrote this statement. The fifteen BMNH *Ornithoptera* unequivocally

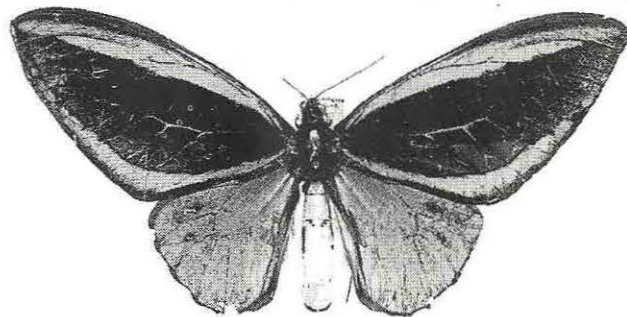


Figure 1. *Ornithoptera priamus poseidon* Doubleday. BMNH 133261. Male. Arru Wall/Aru I. Wallace./Godman-Salvin Coll. 95.-5

collected by Wallace, includes four males of *O. priamus poseidon* from Aru (see Figure 1), each of which might be the actual individual that so moved Wallace at Dobbo. Similarly, there are two females and one male of *croesus* from Batjan. Again, it is frustrating that the available labelling gives no indication as to which (if any) of these specimens might have been involved in Wallace's account.

Sir James Brooke has a rather tenuous association with the Birdwing butterflies, but the link is fascinating in drawing attention to an unconventional aspect of British colonial history — the White Rajahs of Sarawak. In honour of Sir James Brooke, Wallace (1855) described a new species of Birdwing as *Ornithoptera brookiana*, now commonly placed as one of two species in the genus *Trogonoptera*. Wallace clearly had a single specimen in his possession originating from the Ranang River, north-west coast of Borneo. A single male in the BMNH collection (Figure 2) has been widely identified as this individual. It is certainly a Wallace specimen, clearly originating from Sarawak (and no more likely candidate as the original specimen is known to exist). But doubts as to the authenticity of this specimen as a true 'type' remain, reservations reflected in its past history as holotype, lectotype and neotype of *Ornithoptera brookiana* (see Haugum & Low, 1978-9).

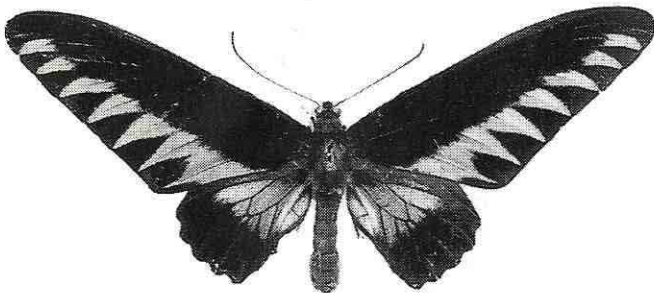


Figure 2. *Trogonoptera brookiana* Wallace. Male Lectotype. Sarawak, Borneo. Wallace./Godman-Salvin Coll. 95.-5.

According to Margaret Brooke (Brooke, 1913), the wife of his successor, James Brooke became Rajah of Sarawak in 1841 largely by public acclaim and through friendship with the heir-apparent, Rajah Muda Hassim. For his own times, Brooke's views were certainly highly progressive. Wallace (1855) when naming *Ornithoptera brookiana* in his honour said "I have named it after Sir J. Brooke, whose benevolent government of the country in which it was discovered every true Englishman must admire". Sir James founded a mini-dynasty that was to last almost 100 years, encompassing three generations of White Rajahs. He was succeeded in 1868 by his nephew Charles, seemingly a much less charismatic individual who nevertheless had the reputation for continuing the enlightened tradition established by his uncle. His was a long reign, almost 50 years; it wasn't until 1917 that his son, Vyner Brooke, took up the title. This somewhat anachronistic dynasty came to an end in July 1946 when Sarawak was finally ceded to the British Crown.

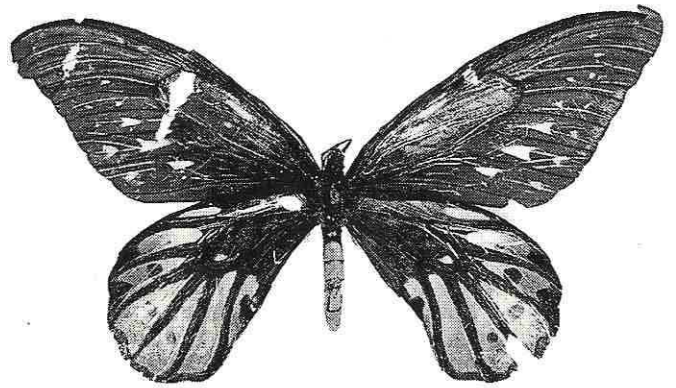


Figure 3. *Ornithoptera alexandrae* Rothschild. Female Holotype. BMNH 102847. N.E. Coast (inland) B. N. G. Meek/Rothschild Bequest. B.M. 1939-1.

The shot Birdwings in the BMNH collections are renowned as 'curios'. Understandably, much of this material is quite badly damaged! Rothschild (1907) described *Ornithoptera alexandrae* on the basis of a unique female (now in the BMNH: specimen number 102847 — see Figure 3) taken by Meek in January 1906 "from the north-east coast of British New Guinea inland to the headwaters of the Mamberé River". Rothschild neither mentioned the copious perforations in the wings nor suggested that it was damaged by shooting. However, a letter from Meek to Karl Jordan written at Biagi (Papua New Guinea) in February, 1906, and held at the BMNH (Meek correspondence, Letter 155), confirms the unorthodox collecting method — "Enclosed is female of large *Ornithoptera* shot by me on way up only two days from coast. This one is a small specimen, mostly running much larger. Females seem to be not too uncommon . . .". Jordan (1908) affirms this in quoting from the label (plausibly in his own hand) associated with the specimen "Type of species shot. The only specimen collected on that expedition". In his subsequent travelogue, Meek (1913: 161) recounts using a shot-gun in a vain attempt to obtain a male of *Ornithoptera chimaera*, but for some reason he does not specifically record using this collecting method for *alexandrae*, his most spectacular find.

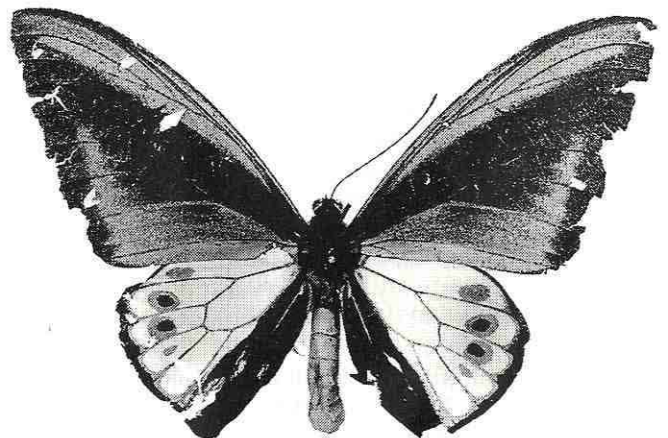


Figure 4. *Ornithoptera goliath huebneri* Rumbucher. Male Paratype. BMNH 135166. Goodenough Isl., 2500-4000 ft., March-May 1914. A. S. Meek./Presented by J. J. Joicey Esq. Brit. Mus. 1931-291.

Additionally, Rothschild, Joicey, and probably Oberthür, obtained material of *O. goliath* from Goodenough Island off eastern Papua New Guinea, again collected by A. S. Meek. The Rothschild and Joicey examples are in the BMNH collection. Although these specimens are characteristically perforated (see Figure 4), they have never achieved the curiosity status of the female type of *O. alexandrae*. Rumbucher (1973) based his description of a new subspecies of *goliath*, *Ornithoptera goliath huebneri*, upon this ex-Meek material. Rumbucher quoted correspondence between the entomological dealer, O. E. Janson, and Charles Oberthür stating "He [Meek] was only able to obtain a few specimens by shooting them as they always flew only about the tops of the highest trees and he couldn't induce them to come down. They are therefore very shattered, as you will see by the one we send you. We regret very much, not to have received better specimens". The type-series in the BMNH collection comprises four males and four females (specimen numbers 135164-71).

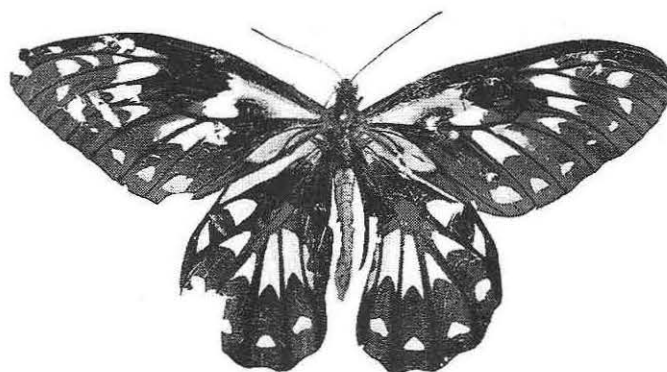


Figure 5. *Ornithoptera victoriae* Gray. Female Holotype. BMNH 102737. Guadalcanal, Wanderer Bay? [Macgillivray] Voyage of H.M.S. Herald. 55-69./Feejee or Solomon Isl.

But most famous of all is the single female specimen captured by John MacGillivray on the voyage of HMS Herald, and described by Gray (1856) as *Ornithoptera victoriae* (specimen number 102737 — see Figure 5). Gray created both a legend and a mystery — "its flight is very elevated; so much so that it became necessary to employ powder and shot to secure the specimen" and "the locality . . . is supposed . . . to be either Solomon Islands, Aneitum, New Hebrides or the Fiji group". Tennent (1997) details how embellishment of the former has continued, and how the latter has been resolved. MacGillivray's manuscript diaries, held in the Public Records Office for England and Wales, are explicit. The entry for 28th December 1854 made at Wanderer Bay on the south coast of Guadalcanal reads "A few insects were taken, among these was a splendid specimen of *Ornithoptera priamus?* f. which I shot, not having a net" — an unequivocal locality and no reference to the butterfly flying too fast or too high, just no net available! As Tennent (1997) notes, by the following day he had provided himself with a net!

The ghost of Gray's initial statement haunted Grose-Smith's (1887) account of the capture of the first known males of *O. victoriae* by C. M. Woodford. Again they are said to have been shot. However, quoting from Woodford's (1890) own account, Tennent clearly shows that although the taking

of the males was unconventional (one knocked down by natives with a bush and the other netted by a naked Woodford!), no male was shot; only the females were taken in this way.

Postscript. Stansfield (1994) identifies the traditional role of natural history museums as the recording and classification of the natural world. And quoting from the Natural History Museum's Corporate Plan for 1986 he demonstrates that their role as the basis for "much experimental work and scientific endeavour" has continued to develop. The historical component in many natural history collections seems to be consistently understated, yet it has much to say both in terms of the history of Natural History and the age of exploration in which many of these collections were assembled. Perhaps there are two major constraints on developing this aspect of natural history in public galleries — firstly, the current vogue for topic related exhibits that tend to have low reliance on actual specimens, and secondly, the absence of available information on how natural history specimens can be exhibited safely.

Acknowledgements

I am especially grateful to Mr John Tennent for sharing his findings with regard to the holotype of *Ornithoptera victoriae* (and much entertaining discourse). Mr Peter Pratt (Croydon) kindly provided information regarding the complicated relationships of the various collectors "Pratt"; Mr John Thackeray (BMNH Archives) gave me access to the relevant correspondence between Levick and Riley, and Meek and Jordan; Mr. Phil Crabb (BMNH Photo Studio) prepared the photographs. Mike Parsons (University of Florida) and my immediate colleagues, Julia Pope, Dick Vane-Wright, Jim Reynolds and Mike Fitton, suggested many improvements and additions to the manuscript, and without Brian Pitkin's expertise the specimen-level database to the *Ornithoptera* would not have materialised.

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BOOK REVIEW

The Moths and Butterflies of Great Britain and Ireland - Volume 3

Yponomeutidae - Elachistidae

Editor: A Maitland Emmet

Published by Harley Books: ISBN 0 946589 43 7 (hardback) - £75

ISBN 0 946589 56 9 (paperback - due March) - £37.50

There has been quite a long gap since the publication of the last volume in this series, Volume 7 part 2 in 1991, and a very long time since the series began in 1976. This latest volume is worth the wait and will have a very significant impact on the study of 'micro' Lepidoptera in the UK. It covers the families Yponomeutidae, Epermeniidae, Schrechensteiniidae, Coleophoridae and Elachistidae. Only the Elachistidae have been served by a relatively recent, easily available text in English (Traugott-Olsen & Nielsen's *The Elachistidae of Fennoscandia and Denmark* in 1977). The Coleophoridae were an especially difficult family to learn, due to a lack of texts and the critical status of many species.

This volume follows the established style for the series with keys to species, species accounts and vice-county distribution maps. Due to the number of difficult taxa, there are hundreds of excellent genitalia illustrations for both males and females. For genera such as *Coleophora* there are keys to the genitalia as well as keys to the moths. In addition, the Coleophoridae, which mostly live as larvae inside portable cases, have a key to these cases, beginning with the foodplant. These are accompanied by superb illustrations of cases on eight plates, followed by nine excellent plates illustrating the adult stages of species of all the families in this book. The distribution maps for many species show that many gaps in knowledge occur; which the publication of this book should help to change.

These volumes are always characterised by an introductory chapter on an aspect of Lepidoptera and this one is no exception. The subject is Invasions of Lepidoptera into the British Isles and contains many maps showing the spread of species such as *Polchrysis moneta* and *Lozotaeniodes formosanus* across the UK (The latter finally reached Lancashire in the summer of 1996). The discussions cover rates of spread and possible governing factors.

An excellent continuation of a classic series which will be a standard for a long time.

Wallace, A. R. 1876. *The Geographical Distribution of Animals with a study of the relationships of living and extinct faunas as elucidating the past chances of the earth's surface.* MacMillan & Co., London, 1:xvi + 503 pp., 18 maps and illustrations; 2:[x] + 607 pp., 9 maps and illustrations.

Wallace, A. R. 1880. *Island Life: or the phenomena and causes of insular faunas and floras including a revision and attempted solution of the problem of ecological climates.* MacMillan & Co., London, xvii + 526 pp., 26 maps and illustrations.

Woodford, C. M. 1890. *A Naturalist among the Head-Hunters, being an account of three visits to the Solomon Islands in the years 1886, 1887 and 1888.* George Philip & Son, London, xii + 249 pp., frontispiece + 15 pls, 3 maps.

Hands-on = Destruction?

The "fate" of the natural history collections at SEARCH

Some readers may already be familiar with SEARCH, Hampshire County Council Museums Service's hands-on centre for history and natural history, based in a former Grammar school building in Gosport. We opened officially in December 1995. After a development period of about three years, it is very pleasing to have all our hard work recognised. In our first year, we are joint winners of the Museum of the Year 1996 "Best Museum Education Initiative" and we have also been highly commended in the Gulbenkian Awards for Museums and Galleries' "Most Imaginative Education Work".

SEARCH for Science offers a hands-on experience through staff-led activity sessions with real (and a few replica) natural history specimens, and with scientific equipment such as video-microscopes. At present, our main audience is school children (aged 5-11), including special needs groups, though we have also hosted open days and very popular family hands-on days to link with National Science Week.

The primary worry of anyone who cares for the well-being of collections in museums, especially curators or keepers, is the potential damage caused by allowing the general public (especially children) to handle specimens directly. In almost three years of hands-on activities with children using a range of specimens in SEARCH for Science, this worry has turned out to be broadly unfounded. We predicted some damage, but in practice, it has been much less than expected.

In SEARCH for Science, virtually all of the 300 or so specimens used for handling are accessioned, either as part of our main collections or acquired and accessioned as "education" collections. Obviously all items have an intrinsic value as representative examples of natural science material. However, we feel that there is no reason why more important or delicate specimens cannot be used in SEARCH, we are just especially careful about how they are handled or displayed (see below). We consistently implement damage-limitation strategies in high risk areas. From our low damage incidence rate and zero "disappearance" rate (so far), we assume that these have been successful. I hope that these

notes may give some hints or encouragement to those of you out there who are tempted to try out some real hands-on activities in your venue!

Communication

- Tell people how important the collections are but make it clear they are trusted to handle things carefully. People (including children) respond to being treated with respect, and generally parents do keep an eye on what their children are doing.
- Instruct visitors on the correct way to handle the collections (eg two hands, one thing at a time) - this gives them the confidence to do it correctly. Address your remarks about handling to the parents or teachers as much as the children. Adults often know as little about care of objects as the children and value being given a few basic rules.
- Be vigilant - you can usually spot a potential ear-pull or feather-ruffle before it arises. The visitor in most cases doesn't damage specimens in a malicious way and will respond to a few reasoned words from a member of staff.

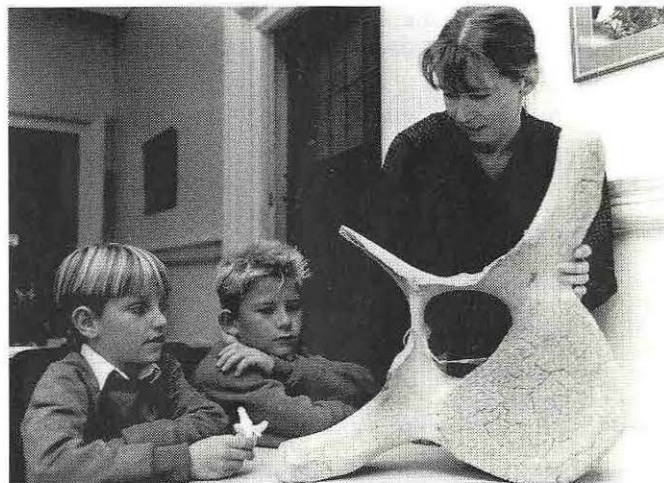
Presentation

- Ask visitors to wash or wipe their hands before handling - simple, but conveys the value of what they will be handling.
- Use specimens in very good condition - visitors will be less careful with items which are already damaged. Remove specimens as soon as you notice any damage, however small.
- Limit the numbers or circulation of visitors - if people feel crowded or rushed, they tend to handle more roughly.
- Provide equipment like video-microscopes or lenses to give some direction to observation and handling. When people know what they are doing and why, less damage occurs.

Limited access

Recognise that some items cannot be handled directly and think about alternatives:

- keep them out of reach but easily viewed
- present them in an accessible way, in transparent or glass-topped portable boxes



- use specimens embedded in clear acrylic blocks
- if the real thing either doesn't look real or it's difficult to use or get hold of (eg human skeleton), use good quality models, but tell the visitors

We have found that the key to the success of genuine hands-on in SEARCH is communication, and though simple, easy to change labels are useful, this is mostly through people. Unfortunately, this is also expensive. We made the decision at a very early stage to use staff as the main interpretative medium, with the cost of this passed on to school groups through charging.

We have invested a lot of time, effort and money into finding, and training, the right people to work in SEARCH.

This has culminated in the recent publication of our training manual, "Going Interactive" which describes a training course in basic communication skills for the kind of people who work in SEARCH. This manual is available for sale from SEARCH by mail order.

If anyone would like to discuss any of the above issues further, please contact me at SEARCH.

Ann Nicol, Natural Sciences Officer
SEARCH, 50 Clarence Road, Gosport, Hampshire PO12 1BU

Tel 01705 501957; Fax 01705 501921
E-mail MUSMAN@hantsnet.hants.gov.uk

BIRDS WANTED

In collaboration with several Museums of Natural History and a number of experts in hawk pluckings, a large scientific feather collection has been assembled over the past 12 years, which is used among other purposes for the realisation of an identification book for feathers ("Bestimmungsbuch für Rupfungen und Mauserfedern"). The collection consists mainly of road kills, oil pest victims, pluckings of raptors as well as sorted out museum skins. It is kept at the Zoological Museum of Hamburg.

For some species there is a considerable deficit of material. Since our work requires to have the feathers in their full length for description, ordinary museum skins are not very useful.

Therefore, I would like to ask if it would be possible to obtain some damaged or undated material of the species listed in the table (especially *Larus glaucooides immat.*, *Circus pygargus* adult male, *Loxia scottica* and *Stercorarius longicaudus*), which could be used to take the single feathers apart. Even skins that have been seriously damaged by insects are still useful for this purpose. I know that these species are fairly rare and you may not have most of them,

but it may happen that you decide to separate some old specimen or that you receive some new material which is not suitable for preparing skins or only needed for its skeletons.

Please let me know what possible service I may provide in exchange. Thank you very much in advance for your help.

Private address : (for letters) :

Gabriel Hartmann, Station 24
NL-6-63NP Vlodrop
The Netherlands

Official address :

Gabriel Hartmann
c/o Dr H Hoerschelmann
Department of Ornithology
Zoologisches Institut und Museum
Martin-Luther-King-Platz 13
20146 Hamburg, Germany

Requested Species

First Priority : (missing completely)

1. *Gavia adamsii*
2. *Pelicanus crispus*
3. *Anser erythropus*
4. *Marmaronetta angustirostris*
5. *Polysticta stelleri* (especially tail)
6. *Aquila clanga* (especially juv.)
7. *Aquila heliaca*
8. *Haliaeetus albicilla* ad. & juv.
9. *Circus pygargus* (esp. o¹ adult)
10. *alco concolor*
11. *Fulica cristata* (esp. tail)
12. *Numenius tenuirostris*
13. *Limicola falcinella*
14. *Larus audouinii* (esp. juv/immat.)
15. *Larus glaucooides* (tail of juv/immat)
16. *Pagophila eburnea*
17. *Xema (Larus sabinii)*
18. *Rohdostethia rosea*
19. *Melanocorypha leucoptera*
20. *Chersophilus duponti*
21. *Hippolais olivetorum*
22. *Sylvia sarda*
23. *Sitta whiteheadi*
24. *Loxia pytyopsittacus* (esp. tail)

Second Priority :

- Gavia immer*
Podiceps auritus
(*Hydrobates pelagicus*)
Cygnus columbianus (juv)
Anser brachyrhynchus
Branta canadensis
Tadorna ferruginea
Somateria spectabilis
Histrionicus histrionicus
Oxyura leucocephala
Mergus albellus (adult male)
Gypaetus barbatus (tail of immat., even single moult feathers)
Aquila pomarina
Hieraetus pennatus
Buteo lagopus
Pandion haliaetus
Accipiter brevipes
(*Falco columbarius* - ad. male)
Lagopus spec. (juvenile)
Tetrao tetrix (tail of ad. male)
Tetrao urogallus (juv. & female)
Vanellus gregarius
Gallinago media
Charadrius leschenaultii
(*Eudromias morinellus*)

- Numenius phaeopus*
Calidris maritima
Calidris ferruginea
Phalaropus fulicarius
(*Phalaropus lobatus*)
Stercorarius longicaudus (esp. ad)
(*Stercorarius pomarina* - adult)
Sterna dougallii (juv)
Pterocles atchata
Columba livia (wild only)
Picoides leucotos

- Anthus gustavi*
Anthus hodgsoni
Locustella luscinioides
Acrocephalus paludicola
Acrocephalus dumetorum
Sylvia melanothorax
Phylloscopus borealis
Tarsiger cyanurus
Oenanthe cyprica
Parus lugubris
Parus cinctus
Emberiza caesia
Emberiza cineracea
Loxia scottica
(*Pyrrhocorax pyrrhocorax*)

Survey of Research Systematics Collections Initiated: Your Participation is needed!

The Association of Systematics Collections has developed a **Survey of Research Systematics Collections and Information**, the results of which will be made available to users of systematics resources over the world wide web. We hope that your institution will participate in the survey, so that information about your institution and its resources can reach colleagues worldwide. Participation in the database will give your institution higher visibility with government agencies and the public, and may lead to new opportunities. And it will help ASC document needs and develop policy options for governments and the private sector, with respect to collections.

This on-line database is a modern approach to providing the same kind of data ASC has collected in the past. In fact, responses to this survey will eventually become part of a longitudinal series of data. You may respond to the survey by contacting ASC for a form, filling it out and mailing or faxing it back. Or PREFERABLY, you may go to ASC's web site (<http://www.ascoll.org/SURVEY/>), download the survey, fill it out, and mail or fax it back to ASC.

All ASC member institutions, and collections that have previously participated in ASC institutional surveys, received copies of the survey in October. Each administratively-separate collection is to complete the survey and return it to ASC as soon as possible. Although ASC's initial distribution of the survey has focused on North American institutions, ASC is willing to include information from institutions outside the region, if they ask to participate.

The collections resources database is the second of two that are **sponsored by the Biological Resources Division of the USGS** (formerly the National Biological Service) in cooperation with a group of 6 US federal agencies and the Smithsonian-NMNH, which compose the Interagency Taxonomic Information System (ITIS). Many federal agencies and other resource management organizations have a strong need for taxonomic information or services that are scientifically credible and readily accessible. The Research

Collections and Information Database (RCID) will provide an entry point for these many users.

The first database, the Taxonomic Resources and Expertise Directory (TRED), has already been distributed, and the responses are now being entered into the database. TRED will be available for searching on the internet at <http://www.itis.usda.gov/itis>. For more information about ITIS, including the data categories it will contain, we encourage you to access this web site. If you have not provided data for the TRED, please call up the ASC web site for information and a copy of the survey.

Send the Completed Research Systematics Collections Survey and TRED to:

Association of Systematics Collections
1725 K Street NW, Suite 601,
Washington, DC 20006-1401
Phone (202) 835-9050 Fax (202) 835-7334
email- asc@ascoll.org

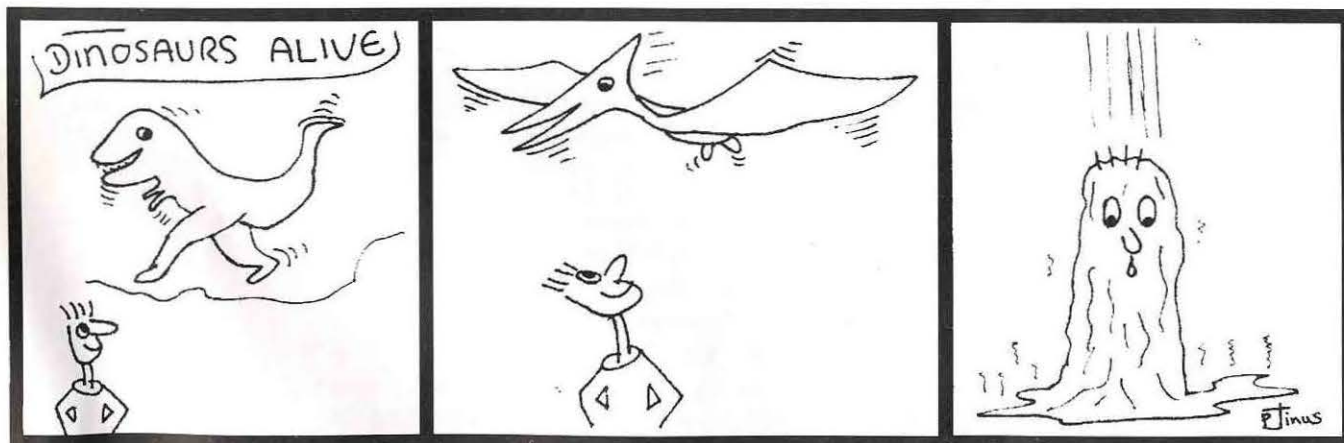
WANTED

Bolton Museum would be interested in loaning a Crown of Thorns Starfish and tourist souvenirs made from coral and other reef species for a temporary exhibition (May-August 1997) on The Conservation of Coral Reefs.

Tel: 01204 522311 ext 2197

APOLOGY

Due to circumstances beyond our control issue 7 was not sent out in time to allow a response, before the closing date for the advertisement for Curator (Dept. of Botany at the Natural History Museum).





Tree Sparrows

J. D. Summers-Smith is trying to reconstruct the spread of the Tree Sparrow *Passer montanus* in south-east Asia, specifically involving Taiwan, Singapore, Borneo, Indonesia and the Philippines. He would be most grateful if you could send him details of the date and place of collection of any relevant skins in your museum.

J. Denis Summers-Smith
Merlewood, The Avenue, Guisborough
Cleveland TS14 8EE, England
Telephone 01287 632449
Fax 01287 632449

The names below provide an opportunity to contact other BCGMembers having a similar concern or interest or to become involved in developing policies and projects

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