NEWSLETTER

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EDITORIAL

The Biological Recording Seminar at Leicester was attended by over 80 people and can be regarded as a resounding success. Everyone we spoke to at the meeting seemed to enjoy the talks and all seemed to feel that the subject of biological recording needed critical discussion. We heard about many problems of both small and titanic (sorry Charlie) proportions and, although answers were not found to them all, the idea of a national forum seemed well received.

We hope to bring you the products of the seminar in printed form in the near future.* Meanwhile, we have already received a couple of last minute contributions which are squeezed into this issue.

We are particularly delighted to be able to include a report on the Cornish Biological Records Unit. The mystery surrounding how this remote part of England functions as a centre based in a non-museum institution is at last revealed! How refreshing it is to read Stella Turk's report; full of enthusiasm and positive thinking - a credit to all concerned and a reminder to the rest of us.

This issue also contains a fair amount of material for those biologists in museums not involved with running a records centre. We would like to hear a lot more about collections, technical matters, books, legislation, displays, exhibitions, storage, research and enquiries during 1985 so that the Newsletter doesn't become too one-sided!

Reading back through some past issues, we noticed that Peter Davis, in his editor's report for 1978/9, had a few good ideas about subject themes for future editions. One suggested topic "current research in provincial museums" seems to have received little coverage in recent years. Are provincial museums still active in other research fields, apart from collection research and local wildlife research? Let's hear from you in 1985.. Short notes, abstracts, summaries of research activities, researchers using your museum etc... etc...

Finally, as we approach the end of Volume 3, and incidentally our tenth birthday, we would like to thank all contributors to this this volume. Our personal editorial aim, to break the 600 page barrier has been achieved (just) without too much provocation. Now is the time to start writing for Volume 4. Everyone could and should, at least, support the 'Museum News' bit. Do remember that we are a true newsletter, not a high-flying biological journal.

Thank you for your support this year;
Keep your pens writing
and
have a nice Christmas.

* This will be in the form of a supplement to the next Newsletter.

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18th September 1984

Dear Sir,

Congratulations must go to the organisers of the BCG seminar 'Biological recording and the use of site based biological information'. The opportunity to renew friendships amid a packed programme of interesting talks is always welcome. The formal sessions and informal chat led to the passing of a resolution. Admittedly discussion about the resolution was curtailed by half an hour (trust BR to spoil the fun) and the five minutes available was used up by semantic banter, but the resolution was passed unanimously and we look forward to a report from the working party in due course.

However on my way home, it gradually dawned on me that I was missing something. My toothbrush and notebook were secure enough, but I had come away without practical advice and little prospect of it. Then the doubts set in. Was I being too unfair to suppose that the proposed Linn.Soc. think tank would be preparing a document for higher comsumption? Was I being too naive to hope that improvements could be made without extra finance? Perhaps if there was a workshop to discuss Paul Harding's suggestions - format standards, taxonomic vetting, data exchange and computing - then I might be the only one to turn up!

But turn up I will, for be it at national or regional level, there must be more involvement, more exchange. The selection and interpretation of data for a planning inquiry may be our most important task, yet how often do we discuss the advantages of different ways of doing this?

The NCC is the only body with statutory responsibility for biological recording, and it has contracted BRC at Monks Wood to carry out the bulk of this work. It would seem appropriate, therefore, that BRC be asked to convene a workshop to tackle some of these practical problems which need action now. Unless I have grossly misjudged the seminar resolution, BRC need not fear that they will tread on BCG/Linn.Soc. toes. They will be walking on a higher plane.

Yours faithfully,

A. G. Irwin

THOUGHTS ON THE LEICESTER BIOLOGICAL RECORDING MEETING
WHERE TO NEXT?

Graham Walley, Nottingham.

The Leicester meeting was a timely and useful revitalization of our biological recording world and Leicestershire Museums and the BCG deserve our thanks.
I found it a curious mixture of depression, deja vu and hope - but maybe that says more about me than the meeting. Having got together let's stick together and keep talking (and start doing). The 1975 Woodstock meeting was meant to be the start of a regular forum and we have missed that. Maybe we can start again.

The meeting was fueled by a general concern about the state of nature conservation in the U.K. today and how we (the BRC's in our various guises) fitted in. Of course there is too much against nature conservation and too little for it - but our concern at our own effectiveness is legitimate.

Biological recording is important in nature conservation because it puts what we know about the U.K.'s plants and animals into some kind of context.
It identifies nationally and locally rare species and communities, it allows distributions to be drawn and monitored, it allows sites that support natural history to be described and all the component parts to be valued, either singly or together. It is a complex task requiring great expertise.

Museums, County Conservation Trusts, the Nature Conservancy and the National BRC all have, use and need biological information and it seems to make sense to have an open transfer of data between everyone concerned for all kinds of reasons - from front-line conservation and development control to museum display and education.

The task is one that is parallel to that of museum documentation and is similar in size and perhaps complexity, and the successes and failures of that should make us pause and seek priorities in a step-by-step way. But perhaps we should not pause too long.

Part of the problem stems from the diversity of the recording centres and the different stages we are at and the different resources we have. Some counties have an actively recording Trust, other Trusts leave it to their museum-based records centre; other centres operate independently of both. Some areas have the NCC actively supporting their local BRC whilst they actively ignore them elsewhere. Some BRC's encourage participation in national recording schemes, others contribute nothing. All very varied.

If helping conservation is our ultimate aim then we need to separate out the various options and priorities for improving biological recording and the flow of biological data.
These are my priorities and the questions that occurr to me and might be considered by the forum proposed at the Leicester meeting.

1)
The way biological information is used in nature conservation generally follows the sequence:

FIELD RECORDING > CATEGORIZATION > EVALUATION > DISSEMINATION

with the standard of STORAGE AND RETRIEVAL affecting all stages, and the National Recording Schemes providing species information for use at the CATEGORIZATION and EVALUATION stages. DISSEMINATION covers everything from informing owners, planners and the NCC to the acquisition and management of sites, and to the use of information in education or adding 'ecological enhancement' to landscaping schemes.

A block at any of these stages could stop a site or species being protected.
If we are looking for a first priority and possibly searching for central funding then the removal of these blocks to the flow and use of biological informtion is the prime contender. It makes sense, for example to concentrate efforts to remove them wherever they are , and whoever owns them. It may make sense to get funds to complete field work in one under-recorded area, than to spend them on computerizing an already adequate manual records centre elsewhere.

But who will decide on the hold-ups and priority cases are? Obviously RSNC, NCC and BRC and the national societies are all involved. Could the proposed forum also contribute?

2)
The next priority is to make more general improvements in contacts and the transfer of data between record centres.Although standardized improvements would benefit both local and national bodies there could be differences between the two in how willingly they would or could implement them. This is a measure of both their flexibility and accountability, as well as their resources.

Improvements in the organization of biological data on the national scale is largely in the hands of the NCC, RSNC, BRC and BSBI and other national societies. I suspect they will be undertaken by each of them separately.
Each organization has their own problems of standardization within themselves.
They all have their own way and inertia - but perhaps some sensible advice from a body, with a larger overview might get a hearing. It would be a start.

The flow of data from the national to the local level is especially desirable from our point of view, but how do you persuade, for example, the NCC to take account of local needs? Why should they?,would it help them? or would it direct resources away from more important work. Or should not the NCC have the resources to keep Biological Recording world together as part of its national duties anyway? Or would that, in itself, be the kiss of death.?

As for the national recording schemes and the collection and interpretation of their biological data we basically need much more of it. We know too little of invertebrate rarity and we need our national knowledge of flowering and non-flowering plants to be regularly updated, and we need more cost-effective wasy of collecting and disseminating this information.

Museums have a special responsibility here to support national recording schemes, contribute to them and, most importantly , maintain the collections of local material that support the local records. No one else will do this.

3)
FIRST STEPS: MANUAL STANDARDIZATION

3.1) site descriptions

Most BRC's use their own version based on the old BRC HABITAT card and the BRC Trust plant recording card. Could the new RSNC forms be the start of a new standard? The NCC uses different recording media according to the major habitat type, and the RSPB, BTO, NT all have their own schemes.

Perhaps more than an actual common recording sheet we need an agreed list of data fields that can be used, and a basic minimum of which should be used for any one purpose.

How do we describe habitats? Whose system? Which species lists do we use? Which measure of abundance?

3.2) site categorization

We start to make sense of the information in the description by categorizing it. What kind of grassland does this site contain, what kind of woodland?

Before we can add our local site information to the larger unit of the region or the country, or put them into the larger context we need to be sure we are talking about the same types of vegetation.

Will the National Vegetation Classification help here; will it provide a basic range of types of vegetation which your local sites will always be between? Will local categories have to be created? How do we go about this? Whose responsibility is it? Is this best done at the regional level?

3.3) site evaluation

How do we put an overall value on a site? Planners want that, and Trusts, so that key sites can be identified and priorities for avoidance or acquisition drawn up.

It is reasonably easy to set categories for the evaluation. Notts and Leics. independently have devised a four tier system: Regional/1st County, County, District, Parish/Local. Presumably others are doing the same.

Justifying the inclusion of a site into one of these is far more difficult to explain - even to oneself. Could it be justified to a public inquiry? Can it be done more systematically?

3.4) Single records.

How do we cope with single records, perhaps of a few species of many different groups collected on one or more sites? The Pink 80 column BRC card forms a standard, but does it still work?, are the data fields adequate?

3.5) Multiple records

The recording cards available for sites and grid references are many and varied. Do they all conform to the data fields needed in (3.4)? Can the species code numbers be made unique? How can they be improved for computerization? Whose responsibility is it to produce improved cards?

4)
SECOND STEPS: COMPUTERIZATION

Computerization has many inherent problems but it increasingly makes sense where standardization is being attempted. More importantly it gives us the chance to make the most of one punching in of information, it saves tedious repetition of typing tasks and once verified it retains its accuracy.
When we are all trying to do too much with too few resources and we have to make the most of a limited workforce it begins to look indispensable.

Maybe the Leicester meeting has thrown up enough interest with enough parties starting on the path of computerization that we can get some agreed standards for information and hardware.

It clearly makes sense for me to receive a tape or disc from the National BRC with all the Notts records on it rather than a print-out that I have to then punch in to my local machine. It makes sense for the national BRC to receive all the Notts records from all groups in one batch if they can be sorted at Monkswood by machine, and then automatically distributed to the national recorders .

If we want to transfer data we need to make sure it is the same information, arranged and recorded in the same way and in a form that can be read by other users. We need common agreement on:

4.1) use of codes

Fixed length codes make sense in many ways but they need to be controlled. Within recording schemes numbered species are used but they are unique only within that scheme. We need a new series of codes if we are to cope with the many groups that are of interest to us in our local areas.

Recently published checklists by the RES and other national societies provide a good basis for code creation.

4.2) use of species names

Do we use original names on records or do we update them, where possible, and if so how do we link them?

4.3) standard records and serial files

Despite the fact that several centres already have established computerized systems using various processing packages they all can produce a basic serial file of records that could be made to contain basic biological information we need. Providing the position, type and length of fields are known this type of data is readily transferable if the media , tape or disc, can be physically read by the receiver.
(Even now this type of transfer could be attempted if all our records could be reduced to the basic "pink card" format).
Once on the user's machine the serial file can be used as source data for any computer package.

4.4) hardware

The MDA can already read discs of various sizes and formats derived from several machines. Although several of us use different machines we could prhaps limit the spread of this in the future. As D.Mellor from Paisley said, 'give us the machines and we will standardize'. Could this be a role for central funding? Perhaps it could be investigated on a regional level.

4.5) routes

We need approved routes for data transfer. It is still far too woolly.
With a network of electronic transfer could the BRC act as a clearing house?
Do we need a stricter use of local records centres as the only route to the BRC? Should county national scheme contacts have to leave data with their local BRC's? Do all local BRC's deserve that consideration? Do we need accredited BRC's? with the BRC stamp of approval? Our varied circumstances will no doubt produce varied solutions.

4.6) concentrating resources

The main cost of biological recording is the field work, the identification of specimens , the punching in of the data, and storing the data electronically in an accessible form.
It would be madness not to make the most of any of the very labour-intensive operations

Do we go for the day-to-day use of small computers locally and centralize the expensive computer power and peripherals(such as fast or good-quality printers, micro-fiche producers, open-reel tape decks etc), on a regional or national basis? Or do we run independent larger machines locally?
In the museum world could we expect Area Service support for biological recording agency work in the same way that conservation and taxidermy work is supported?
Could a Trust or museum record centre get its data punched and stored and organized by a larger centre and have it enter the network that way? (Hopefully there will be a network)

4.7) centralized production of computer-aids

There are some tasks that should be done once, nationally and shared by the many, (and perhaps subscribed by the many)

a) literature searches/references

A continuing interest of FENSCORE that has so far eluded us is the indexing of biological records and references to collections that are present in many national and local publications and manuscripts.
The work of Bill Ely of Rotherham has shown what can be done but it deserves to be done in the same way across the country and stored electronically to provide the maximum of access (it may even make money via PRESTEL). It need be done once only. Would computerization of the extensive card indexes held by the BM(NH) be a starting point?

b) checklists

Electronically stored and distributed checklists would be exceptionally useful, especially in the productuon of dictionary files that link names, synonyms, English names and codes.
They lend themselves to being readily corrected, updated and changed into hard copy in various forms.
(This could be two-edged weapon of course- slow revisions make for stability)

c) dictionary files to facilitate input

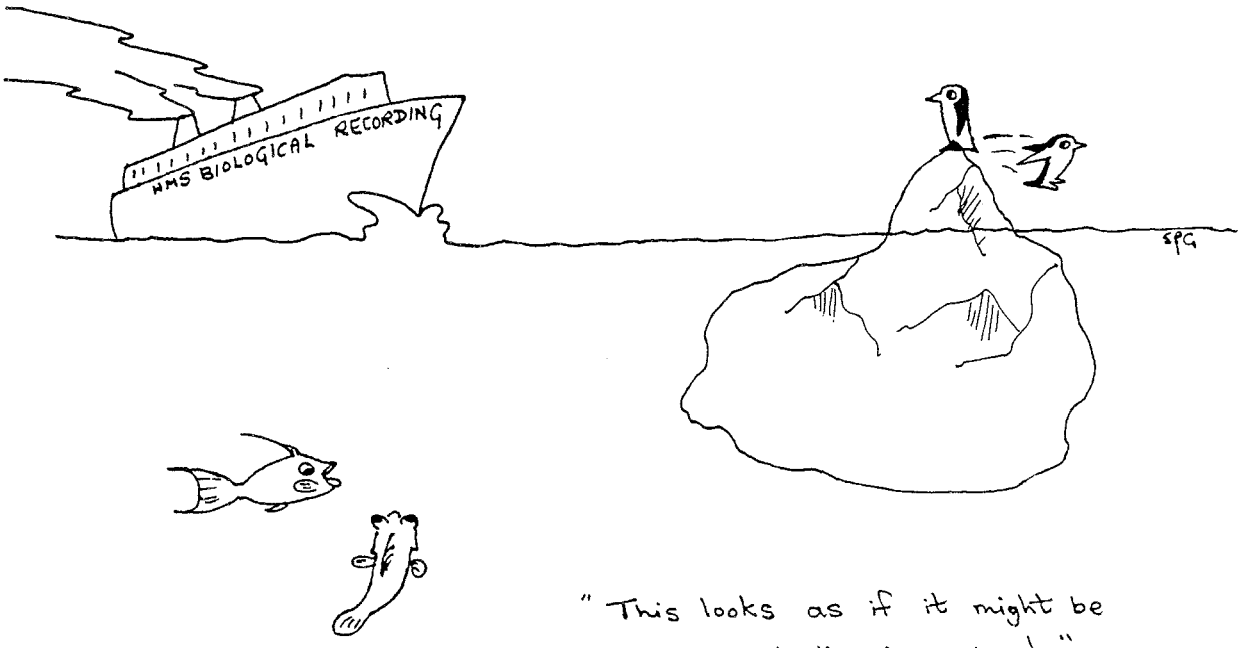
This is an extension of the latter. Codes save storage and processor space and hence money, but their production is expensive and prone to error.
I'm working on an inputting aid that will accept any unique abbreviation of scientific names and commoner synonyms, english names etc and produce the correct four digit code to be used in the computer. This is exceptionally useful for adding data from original field records that are not in the controlled record card form, and would be useful elsewhere where codes are needed to be generated accurately. It is the type of operation that is expensive to produce yet need only be done once to be usedful to many users.

5)
CONCLUSION

Clearly there is much to be sorted out, especially in linking the recording techniques at the national and local levels, and the flow of data and where we fit in. The job is far too important to be held back by parochialism and lack of imagination. Nature conservation will be increasingly fought for by facts and figures and biological recording is part of that.

In the Midlands we are attempting to get some exchange of ideas and methods in the next few weeks. A meeting planned for November '84 will bring together the biological recording people of Derbyshire,Leicestershire, Lincolnshire, Nottinghamshire and Warwickshire. We will report back on.

Biological Recording organizations in the UK do need a forum of some kind to take ideas and discussion started at Leicester this year further. We need a "where do we go from here" group that draws from all the main parties of the biological recording world, a BRC equivalent of FENSCORE that keeps the same grass-roots contact. Whether we need the equivalent ot the MDA remains to be seen.



"This looks as if it might be environmentally damaging!"
(inspired by a talk at Leicester)

CORNISH BIOLOGICAL RECORDS UNIT

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INTRODUCTORY NOTE

At the recent (September 1984) BCG seminar at Leicester, I was considerably surprised by the great variation of means available to, methods practiced by and material stored in the extant Regional Biological Record Centres. The common thread is the use of the county museums as bases but, as we do not even conform in that respect, I have readily accepted the opportunity to describe the work that we currently carry out in Cornwall as a sub-department of the University of Exeter. Personally, I would like to see a series of articles describing the accomplishments of and difficulties experienced by the various Regional Centres, with suggestions for improvements. I believe that we can learn from one another.

HISTORY AND AIMS

As early as 1962 when my husband (Dr.F.A.Turk) was President of the newly-formed Cornwall Naturalists' Trust (re-named Cornwall Trust for Nature Conservation in 1983) he conceived the idea of centralising species records for the county. Honorary recorders were appointed and the county museum agreed to house the records which were entered on specially designed cards. However, there was no means of transferring data and the various recorders neither wished to duplicate all their own records nor to hand over material on which they were still working. Moreover, although most plants had good coverage, a few did not attract recorders, as was true of the animal groups.

In 1972, four years before retirement as Reader in the Extramural Department of the University of Exeter, Dr Turk was asked by the Director of Extramural Studies, Professor T.F.Daveney, to devote a quarter of his teaching time to forming a Cornish Biological Records Index in collaboration with the newly-formed Institute of Cornish Studies, born from liaison between Cornwall County Council and the University and directed by Professor A.C.Thomas. As will be shown, this index has blossomed into the Cornish Biological Records Unit (CBRU) which, until 30th September of this year, was still under the direction of Dr Turk, a Research Fellow of the University since his retirement in 1976.

From the outset he was determined to record everything that had lived or still does live in Cornwall, and to tailor the work to the needs of the county. Thus the Index includes fossils and, still more important in a county so rich in Bronze and Iron Age remains, the subfossil fauna and flora. The Director's own researches are now almost exclusively in the field of archaeozoology.

We have continued to work in close collaboration with the County Museum, the staff of which regard us as an integral part of their resources. This is how the CBRU became the only Biological Records Centre to be under the aegis of a university. It is also the reason why a considerable part of its work is in servicing the needs of Cornish archaeologists and, to a lesser extent, research geologists and palaeontologists.

FUNDING AND STAFFING

The University of Exeter finances this part-time work with a research honorarium and an annual sum to cover expenses plus the services of a secretary for ten hours a week. Initially, from the expense account, a small sum was paid per hour to a few willing helpers for compiling One Species Record Cards from such basic sources as the Victoria County History of Cornwall. The main extractor of such records has, since 1978, become the part-time secretary. The previous year the project qualified for help under the Job Creation Scheme and two youngsters were allocated to cross-reference species records to a 10 km square system, enabling records to accumulate for national mapping schemes as well as acting as an inventory for each such square.

In 1979 a S.T.E.P. project allowed two employees to lay the basis of a Bibliography of Cornish Natural History. They worked in the Local History Studies Library under the direction of my husband and the Unit's secretary.

From its inception I helped my husband in a voluntary capacity with various aspects of the work as required, but every year saw an increase in involvement until, in the 1980s, I have been spending two or three days every week in Murdock House, Redruth where the records are kept, as well as dealing with the ever-growing amount of correspondence, After 30th September 1984 I myself take over the directorial duties.

VOLUNTARY HELP

At the recent seminar in Leicester, voluntary workers were described by one speaker in a despairing tone by one speaker as a 'mixed bunch', whilst another delegate, already coping single-handed with day-to-day work as a natural history curator as well as running regional BRC for the county, said that she did not have time to oversee such workers and that correcting mistakes was more time-consuming than undertaking the work in the first instance.

We have been fortunate in two ways, for not only have we attracted some first-rate help, but I have been at hand in Murdock House to devote as much attention as necessary to allocating and discussing work. It is this interchange that in turn the helpers say they find profitable to their own natural history interests.. They also enjoy talking to others with like interests, both fellow volunteers and those that call to consult the records, joining in fieldwork from time to time, and having the satisfaction of knowing that the work to which they contribute is not only useful now, but will have a lasting place in what future remains for us. Our own experience as Adult Education tutors has pre-adapted us for the situation as it developed at the CBRU. Many of the volunteers are past or present members of Adult Education classes, whilst others are students pausing between graduation and a post-graduate course or young graduates 'resting' between an M.S.C. job and further employment. We have found it encouraging for all helpers to give them a task which they can see through to a stage of completion, such as preparation of records for mapping, or compiling all records of some small group.

DATA BANK

1. BIBLIOGRAPHY
   At an early stage it was evident that a comprehensive bibliography was an essential tool and in 1979 an M.S.C.

S.T.E.P. scheme in collaboration with Cornwall County Council became possible, on the understanding that the County Library was allowed to make a microfilm of the references.

Local journals and books were searched as well as standard texts and papers in widely scattered journals, many of them from our own library. We also visited the Library of the Marine Biological Association on several occasions.

In due course the secretary prepared an index covering appropriate cross-references to 10 km squares (or failing that, a region of Cornwall), subject (including collections), habitat and botanical or zoological categories. All records extracted onto the One Species Cards from the bibliography are indicated by author, initials and date. There are now some 8,500 items on the bibliography which includes MSS and covers a period from the 13th Century to the present, to which we add constantly.

2. SPECIES

To date we have over 24,000 species of plants and animals, representative of all groups, on One Species Cards (BRC's Gen. 2) covering some 300,000 records, cross-referenced on 10 km square sheets. With the present upsurge of interest in natural history, new county records (eg. for the nudibranch molluscs, parasitic copepods and most insect groups) are not uncommon, although of course the main work of our part-time secretary and our volunteers is to add to the records of species already recorded on cards.

3. SITES

We have over 400 surveys in the files, varying from short species lists to comprehensive descriptions of large sites, with species lists, vegetation maps and photographs. They are kept in files arranged in sequential order of the sixty Cornish 10 km squares, so maintaining the grid references as a basic index. Most of these sitessurveys and reports are the work of the Unit's 'staff', but we also have the National Trust series of reports and various others from the Nature Conservancy Council as well as theses and results of contracts with industry.

In order that one can trace readily and extract species records, the groups are listed on special 10 km chartsheets under the names of the surveys in which they occur. Especially helpful in this aspect of recording have been the gazeteers of the county compiled by the Cornwall Fire Service and the South West Electricity Board and kindly donated by those authorities.

4. HABITAT CARDS

In the early 1970s cards were devised for recording woodland, standing water and Cornish hedges. These have not been as successful as the other schemes, but recently the British Trust for Conservation Volunteers has intimated that "they will be valuable in helping us to monitor our work and assess the value of conservation projects". We regularly use the marine cards for rocky and sandy shores, prepared by the S.W.Biology Study Group in 1968. All of our intertidal surveys follow the headings on these cards.

5. GROUP FILES
These are used for lists of species from various Cornish localities that can not be placed in any one 10 km square.

6. REGISTER OF SPECIALISTS
Names and addresses are kept of specialists working on various plant and animal groups. We are frequently asked for such information at a local or national.

7. FILE OF CONSERVATION SITES
We keep lists of the Cornwall Trust for Nature Conservation Sites registered with the Planning Department SSSIs, and National Trust properties.

LINKS

Does our network work? The following are some of our links...

1. BIOLOGICAL RECORDS CENTRE, Monks Wood
From the beginning we adopted the cards and methods of the BRC in order to facilitate exchange of records. On two occasions representatives have been able to visit the National Data Bank at BRC, where we have received every courtesy and help in photocopying material relating to Cornwall. Although we are still not able to send in as many records as we would wish for, the mapping schemes, we are able to do so much more than previously, thanks to voluntary help.

2. NATIONAL MAPPING SCHEMES NOT CONDUCTED BY B.R.C. STAFF
We have direct links with the schemes of the Conchological Society (non-marine and marine) and Botanical Society as well as those for Orthoptera, Isopoda, Cladocera, Araneae, Echinodermata and marine Algae. We have in return received Cornish records from the national scheme organisers.

3. COUNTY MUSEUM
This museum, located in Truro, differs fairly considerably from most others in England. It is the property of the Royal Institution of Cornwall, founded in 1818 and supported by the membership, whose subscriptions now do little more than cover the cost of publishing the annual Journal. Grants from Cornwall County Council have become essential to the maintenance of the fabric and its important collections. As already stated, we work closely with the staff and this autumn we have been asked to assess the natural history collections held at the R.I.C. and to prepare a report to a subcommittee of the Council of the Institute detailed to consider future policies regarding all the collections.

4. CORNWALL COUNTY COUNCIL LOCAL HISTORY STUDIES LIBRARY, Redruth
We were provided with a venue at this library for the STEP scheme to compile a Cornish Natural History Bibliography in 1979, and the staff continue to help us in many ways, whilst we reciprocate by informing them of any Cornish material which might otherwise escape their notice. The Library holds the largest collection in the world of items on all aspects of Cornwall.

5. CORNWALL TRUST FOR NATURE CONSERVATION
The fortunes of the Trust have improved as membership has risen and a number of large-scale M.S.C. schemes have been

made possible. Amongst other projects, most of the several hundred Registered Conservation Sites have now had their boundaries mapped and vegetation surveys prepared.

With a Conservation Officer and her Assistant on the paid staff, all relevant planning applications are dealt with by the Trust. Essentially the work is conservation-orientated and, although various species records are passed on to the CBRU, the surveys are kept in Trust files for their own interpretation of the data. Species records are not compiled by the Trust. Any material in our care is made available to the CTNC, as it is to any enquirer 'without fear or favour' since we supply information to industry, developers and conservation groupsalike. We maintain that a record centre should be impartial in all matters, ensuring however that the precise localities of rare or 'collectable' species are treated strictly confidentially.

We work particularly closely with the Trust on marine conservation and have helped in the pioneering of a Voluntary Marine Conservation Area in the Fal Estuary. We are now involved in the exploration of some form of protection for the Helford River.

6. NATURE CONSERVANCY COUNCIL
The Regional and Assistant Regional Officers as well as the Chief Scientists Team have been equally helpful in obtaining for us various important reports and surveys. The contract work on the sublittoral zone off Cornwall and the Scillies has provided us with data for the marine mollusc and algal atlas es as well as generally enriching our databank. We were also able to help with survey work and records when the Intertidal Survey Unit worked on Cornish shores under an NCC contract. Records and from SSSIs are passed on as they become available and three surveys of SSSIs have been undertaken specifically for the Regional Office. We have also been able to help with the compilation of the Invertebrate Site Register, information on rare and endangered species and data relating to marine conservation.

7. THE NATIONAL TRUST
From the time that the N.T. Biological Survey Team was formed in the late 1970s and the first 60 sites in Cornwall were surveyed in 1979, we have worked closely and cordially with the N.T., exchanging data whenever possible. Further Reports were produced by the Team in 1982 and we have the full number of these in the CBRU office. Our association with this organisation has been amongst the most fruitful and we hope it will continue to be so.

8. MARINE BIOLOGICAL ASSOCIATION OF THE U.K.
We receive much help from the staff at the M.B.A. Laboratory at Plymouth and we have every facility afforded us when we visit them to consult their Library. All records, reports or specimens likely to interest the staff are forwarded in the normal course of events. Marine records and site surveys are extensively represented in the CBRU Data Bank, as befits the English county with the longest coastline and a wealth of 'southern' species.

9. LOCAL AND COUNTY-BASED SOCIETIES AND GROUPS
Our links with Camborne-Redruth Natural History Society, which celebrated its Jubilee in 1981, are necessarily

close since we are founder members, and our secretary and her husband have been Hon. Secretary and Chairman respectively since 1978. We are often involved in fieldwork with the CRNHS as well as the Lizard Field Club of which my husband is the present president. With membership of the Cornwall Bird Watching and Preservation Society, founded in 1931, we are assured of the publications being immediately available and we hold a complete run of their Reports. Currently, a volunteer is engaged on the continuation of extracting all bird records onto One Species Cards. We are frequently in touch with the Royal Society for the Protection of Birds, officers of which are very active in county affairs.

Very recently we have been approached by the Development Officer of the British Trust for Conservation Volunteers which expects to use our habitat cards.

Close touch is maintained with all archaeological work by membership of the Cornwall Archaeological Society and by personal contact with Professor A.C. Thomas.

10. MINISTRY OF AGRICULTURE, FOOD AND FISHERIES
Over the years we have developed useful links with various of the county services, including Rosewarne Experimental Horticultural Station, Newlyn Fisheries Office and the Veterinary Investigation Centre.

11. CORNISH BIOGRAPHICAL INDEX
We have a particularly strong link with the Cornish Biographical Index which is under the direction of Mr.F.L. Harris, Hon. Research Fellow of Exeter University, and which is also housed in Murdock House. Amongst the many sections of this extensive index is one devoted to Cornish 'naturalists' (in the widest sense) from the 12th Century to the present. This is of great use in many ways, including validation of some early biological records.

OUR CLIENTS

1. EDUCATIONAL GROUPS
We are often consulted about where local or visiting groups might study particular habitats with the greatest advantage to themselves and least harm to the environment. Individual teachers and students also turn to us for help on study projects, identification etc.. This includes groups from far beyond the county border, a fact that reflects the popularity of Cornwall as a venue for holiday work of all kinds.

2. RESEARCH WORK
Help is extended to students and staff of universities and colleges relating to various aspects of work in Cornwall, including references to literature, information concerning the distribution of species, types of habitat, former records etc.. Those engaged on the Bristol University Lizard Project have consulted our invertebrate records and we continue to be involved in this valuable work.

3. ENVIRONMENTAL HEALTH DEPARTMENTS, MEDICAL SERVICES AND VETERINARIANS

Due to our specialist interest in insects and mites of medical and public health importance, we are frequently able to provide an identification service, as well as supplying

information on the incidence of a particular species in the county. In this way we have given professional help in research on acarine-caused human dermatoses, coauthoring with the County Dermatologist several papers on patients domiciled in Cornwall and, more unexpectedly, help in the investigation of a serious disease of dogs caused by a nematode worm of which the intermediate host is one or more species of slugs.

4. GENERAL PUBLIC
A growing number of individuals of all ages and stages of knowledge, 'phone or write with natural history queries, particularly on identification, and at the same time of course they add to our records, often very significantly in the case of migrant insects, drift organisms and sea-borne tropical seeds.

5. ARCHAEO-ZOOLOGY AND BOTANY
The Cornwall Archaeology Society is the centre for such studies in the county. Many reports have been prepared by Dr Turk, mainly on bone material, including several on the extensive finds from Nor-nour, Isles of Scilly. In this connection, distributional records played a major role, especially for fish and the smaller mammals. Human remains are not neglected (eg. the report on 9th Century graveyard population at Crantock) and this caused us to consider whether a register should be opened for records of pre-historic human remains. All relevant literature relating to these is already in the bibliographical index.

6. MINISTRY OF DEFENCE CONSERVATION SITES
We have helped with survey work at two of the MoD sites and the Unit is represented on the Conservation Committee of Nancekuke.

PUBLICATIONS

Our 6th Annual Report "Cornish Biological Records" has just been published by the Institute of Cornish Studies. This contains noteworthy records of various groups, excluding birds (which are published annually by the Cornwall Bird Watching and Preservation Society) and vascular plants (to be published by the Institute of Cornish Studies as a series of supplements to "A Review of the Cornish Flora 1980" by L.J.Margetts and R.W.David, published by the I.C.S. in 1981). C.B.R. No.3 was entirely on the alien fauna of Cornwall, and currently Dr Turk is working on an annotated list of sub-fossil Cornish plants and animals which will constitute No.7 in the series.

PROBLEMS

Despite all our help, the work is so labour-intensive that there is inevitably a backlog of records waiting to be incorporated fully into the system. At the same time there are so many records already'processed' that the prospect of computerising all the data is a daunting one, expensive in time and money. If such were attempted we would wish to be sure that we were using a system that could be reconciled with that being used by other centres and organisations so that the maximum benefit would accrue. If this did happen, for a very long time, we would still need to rely on handling the records to relay information.

Another problem lies in 'netting' all possible information. Cornwall, by virtue of its geographical position and southern

fauna and flora, attracts many visiting groups and individuals, not all of whom are aware that we value copies of their findings on whatever scale and in whatever form. A national network on the basis envisaged would certainly help with publicity and it would be of great assistance if an annotated list of all Regional Record Centres could be updated annually and published in the BCG newsletter.

We would like to have the resources to instigate a photographic archive so that the many changes in the Cornish countryside can be recorded.

It would also be valuable to arrange investigations of the fauna and flora of mines but, so far, little has been attempted in this field although we do have a few records of the phreatic fauna of the county.

RESUMÉ

With the exceptions mentioned above, the major source of our day-to-day help has come from past and present students at the Department of Extramural Studies (which holds three year courses leading to a Certificate of Natural History Studies) where the biological sciences have, for several decades, been one of the major parts of the work in Corwall. Cornwall is so far from the nearest university that the university presence here is more necessary and perhaps more varied than in most parts of the British Isles. Cornwall is still, at least as far as its cultural background is concerned, a Celtic Kingdom and the University's Institute of Cornish Studies is an expression of this and of the greatest academic importance. Cornwall County Council makes liberal grants(so far as one of the poorer areas of Britain is able to do) to further the University presence here, and this has been an important factor in determining the history of the CBRU and its unique character. Even today, the county is geographically isolated, with a unique geology, a coastline unmatched for length and for variety, and such characteristics as the long upland granite spine, centuries of mining activity and a uniquely southern latitude. All this makes its fauna and flora, as well as their study, a somewhat isolated area of academic interest which, in the broadest sense is 'un-English.' All this is reflected in the nature of the University presence and the somewhat different nature of our work to that which has been undertaken by other Regional BRCs. We suspect that our more distant distant future will see greater conformity with other Centres, but believe that diversity of region, nature, needs and history of all parts of the British Isles makes more than the most flexible standardisation positively detrimental..

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Pesticides in Museums

J Lee, Sheffield City Museums

A very wide range of chemicals is available for use as pesticides (see Cornhill 1973). In museums, a large number of different preparations are used and it appears that no two institutions have adopted the same protection strategy.

Information is accumulating all the time concerning the dangers presented to human health by many of these chemical preparations, and it is becoming apparent that a different approach to the problems of collection protection may be needed.

"Even when approved for application to collections, however the multitude of health problems caused by these chemicals forces one to reconsider their use at all, but particularly when used as the sole, continually applied means of pest control. Some of the approved pesticides are potential hazards to the specimens or the storage equipment.
This book makes it abundantly clear that means other than chemical must be developed to control pests in museums. One that is mentioned as being in use in some institutions is temperature and humidity control. Creative thought should produce other methods." - Curator Vol 25/3 1982

- Extract from a review of 'Pest Control in Museums: a Status Report' 1980

The following chemicals are listed in this book:-

1. Pesticides recommended and registered for "Museum Use". USA

DOWFUME 75 (70% ethylene dichloride and 30% carbon tetrachloride). Recommended use: in a fumigation chamber. Threshold Limit Values*: Time Weighted Average = 23 ppm (proposed to be reduced to 8 ppm); Short Term Exposure Limit = 41 ppm (proposed to be reduced to 16 ppm). Reactivity to Materials: May soften plastics; appears to accumulate in fatty materials which must be well aerated after exposure. Effectiveness: as fumigant, chamber only. Organs affected: Central nervous system, kidneys, liver, skin. Carcinogenic effects. Liver cancer in animals, suspect in humans.

NAPHTHALENE (Moth flakes, Moth balls)
Recommended use: repellent in storage cases. Threshold Limit Values: Time Weighted Average = 10 ppm 50 mg/m^{-3}; Short Term Exposure Limit = 15 ppm. Reactivity to Materials: Can recrystallize on specimens. Effectiveness: as repellent. Organs affected: Liver, kidneys, blood, central nervous system, skin and eyes. Suspect carcinogen - see Wolf 1976 and Wolf 1978 for reference to cancer diseases amongst Napthalene cleaners.

*Time Weighted Average - Threshold Limit Value (TLV) = average concentration for an 8 hour day, 40 hour week, to which nearly all workers may be repeatedly exposed.

Short Term Exposure Limit (STL) maximum concentration to which workers may be exposed for a period of 15 minutes with no more than 4 exposures per day with one hour intervals.

EPA - Environmental Protection Agency of USA.

2. Pesticides recommended and registered for use in "Public Buildings/Institutions". USA

PYRETHRUM (Pyrethrin)
Recommended use: in storage cases.Threshold Limit Values: Time Weighted Average = 5 mg/m^3; Short Term Exposure Limit = 10 mg/m^3. Reactivity to Materials: Unknown. Effectiveness:in storage cases, as contact pesticide. Organs affected: Skin, respiratory system, central nervous system. Carcinogenic effects: Unknown.
Plant flower extract. Very effective insecticide rapidly decomposed by light and inactivated in air. Rapid knock down and repellent capability. No toxic residues. Considered safe in the presence of food stuffs.

VAPONA STRIPS (A13-20,738,DDVP, Dimethyl dichlorovinyl phosphate, Dichlorvos, Harkol, no-pest strip, Nuvan, Vaponite)
Recommended use: in storage cases and sealed display cases. Threshold Limit Values: Time Weighted Average = 0.1 ppm; Short Term Exposure Limit = 0.3 ppm. Reactivity to Materials: Forms an acid in humid situations, may corrode metals, may "bleed" onto specimens. May bleach some specimens - see Scoble 1983. Effectiveness: for maintenance and fumigation in storage cases. Organs affected:Central nervous system, eyes, respiratory system, cardiovascular system. Carcinogenic effects: National Cancer Institute tests are negative. Reproductive effects: suspect.

VIKANE (Sulfuryl fluoride)
Recommended use: highly promising, requires research. Threshold Limit Values: Time Weighted Average = 5 ppm; Short Term Exposure Limit = 10 ppm. Reactivity to Materials: Unknown. Effectiveness: as fumigant. Organs affected: Eyes, respiratory system, central nervous system, kidneys. Carcinogenic effects: Unknown.

3. Pesticides recommended and registered for use in fumigation chambers. USA

ETHYLENE OXIDE (Carboxide, epoxyethane, ETO (in pure state), Oxyfume, Oxirane, Penngas).
Recommended use: in chambers by trained personnel. Threshold Limit Values: Time Weighted Average = 50 ppm (proposed for reduction to 10 ppm); Short Term Exposure Limit = 75 ppm. Reactivity to Materials: Settles in rubber, fatty materials of leather etc. Such specimens should be aired thoroughly. Effectiveness: as fumigant, in chamber only. Organs affected: Skin and eyes, respiratory system, central nervous system, blood. Carcinogenic effects: May cause leukemia in humans. Lethal, highly flammable, vapour explosive.

METHYL BROMIDE (Brom-O-Gas, Brozone, MeBr, Meth-O-Gas, Terr-O-Gas)
Recommended use: Only by Certified Applicator. Threshold Limit Values: Time Weighted Average = 15 ppm (proposed to be reduced to 5 ppm); Short Term Exposure Limit = (proposed to be set at 15 ppm). Reactivity to Materials: Do not use with proteins or other materials containing sulphur (rubber, fur, feathers, leather, some paper, wool). Do not use with metal, cinder blocks, charcoal, mixed concrete, mixtures of mortar and soil. Effectiveness: as fumigant, in chamber only. Organs affected: Central nervous system, respiratory system, skin and eyes.Carcinogenic effects: Unknown.

4. Pesticides not registered for use in Museums, Institutions or Public Buildings. USA

EDOLAN-U (Eulan CN, Mitin FF)
Recommended use: possibly for moth proofing. Threshold Limit Values: Not established; however, LD_{50} = 600 mg/kg. Reactivity to Materials: Bonds with keratin in hair, hides and certain horns; may affect colour of specimens. Effectiveness: as contact pesticide. For maintenance, as permanent "moth proofing". Organs affected: Skin, eyes. Carcinogenic effects: Unknown.

METHOXYCHLOR (Chemform, Marlate, Moxie, biodegradable form of DDT)
Recommended use: possibly in storage cases, requires investigation. Threshold Limit Values: Time Weighted Average = 10 mg/m^3. Reactivity to Materials: Unknown. Effectiveness: as contact pesticide and for maintenance in storage cases. Organs affected: Possibly liver; in animals central nervous system, liver and kidneys. Carcinogenic effects: National Cancer Institute studies negative; International Agency for Research on Cancer studies indefinite.

PARADICHLOROBENZENE (p-dichlorobenzene, Di-Chlorocide, PDB, PARA, Para-Di, Paracide, Paradow)
Recommended use: probably, in storage cases. Requires minor usage registration. Threshold Limit Values: Time Weighted Average = 75 ppm; Short Term Exposure Limit = 110 ppm. Reactivity to Materials: Softens some plastics, resins and tar paper; and affects some pigments on leather. Forms chlorine gas in closed containers that may bleach specimens. Effectiveness: as fumigant and for maintenance in storage cases. Organs affected: Liver, kidneys, respiratory system, skin and eyes, central nervous sustem. Carcinogenic effects: Currently being tested by EPA.

5. Pesticides not recommended for use in Museums, USA

ALDRIN
Recommended use: None. Threshold Limit Values: Time Weighted Average = 0.25 mg/m^3; Short Term Exposure Limit = 0.75 mg/m^3. Reactivity to Materials: Bonds with keratin and other proteins. Effectiveness: as contact pesticide and for maintenance. Organs affected: Liver, kidneys, central nervous system, skin. Carcinogenic effects: Both Aldrin and its breakdown product, dieldrin, are suspected human liver carcinogens.

CARBON DISULPHIDE
Recommended use: None. Threshold Limit Values: Time Weighted Average = 20 ppm (proposed to be reduced to 10 ppm); Short Term Exposure Limit = 30 ppm. Reactivity to Materials: Tarnishes metals. Effectiveness: as fumigant. Organs affected: Central nervous system, peripheral nervous system, cardiovascular system, kidneys, liver, skin, eyes. Carcinogenic effects: Unknown. Reproductive effect: Suspect.

CARBON TETRACHLORIDE (Carbon-Tet)
Recommended use: None.Threshold Limit Values: Time Weighted Average = 10 ppm (proposed to be reduced to 5 ppm); Short Term Exposure Limit = 20 ppm. Reactivity to Materials: softens and dissolves lacquers, waxes, rubber; corrodes metals. Effectiveness: as fumigant. Organs affected: Central nervous system, kidneys, liver, skin. Carcinogenic effects: Causes liver cancer in animals, suspect in humans.

DIELDRIN (Dieldrite, Octalox, Panoram D31)
Recommended use: None. Threshold Limit Values: Time Weighted Average = 0.25 mg/m^3; Short Term Exposure Limit = 0.75 mg/m^3. Reactivity to Materials: Bonds with keratin and other proteins. Effectiveness: contact pesticide, and for maintenance. Organs affected: see ALDRIN. Carcinogenic effects: as ALDRIN.

ETHYLENE DICHLORIDE (1,2-dichloroethane)Recommended use: None. Threshold Limit Values: Time Weighted Average = 50 ppm (proposed to be reduced to 10 ppm); Short Term Exposure Limit = 75 ppm (proposed to be reduced to 15 ppm. Reactivity to Materials: softens or dissolves waxes, and fatty substances. Effectiveness: as fumigant. Organs affected: Skin and eyes, liver, kidneys, lungs, central nervous system, cardiovascular system. Carcinogenic effects: Suspect.

HYDROGEN CYANIDE (Aeor Discoids, Cyanogas, Cyclon, HCN, hydrocyanic acid, prussic acid)
Recommended use: None. Extremely dangerous. Threshold Limit Values: Time Weighted Average = 10 ppm (proposed to establish 10 ppm ceiling); Short Term Exposure Limit = 15 ppm. Reactivity to Materials: Very slight odour remains on ethnographic materials. Effectiveness: as fumigant. Organs affected: Central nervous system, respiratory system, skin. Carcinogenic effects: Unknown. Human toxin.

To this list may be added other chemicals in use in the UK.

CHLORDANE An organochlorine forming a resinous film. May be absorbed through skin.

DDT and ARSENIC Both formerly used in UK collections and likely to be still used in museums abroad. (see UNESCO 1968).

LETHANE Organic thiocyanate. Used to improve the knockdown capabilities of chlorinated hydrocarbon and organophosphorus insecticides in household sprays.

LINDANE - Gamma BHC. Benzehexachloride.

MALATHION Organophosphorus - corrosive to iron - moderate persistence and low mammalian toxicity.

MERCURIC CHLORIDE Widely used to poison herbarium material.

PENTACHLOROPHENOL (Mystox). Principally used in mould and insect proofing of herbaria.

PHOSPHINE (Aluminium phosphide). Inflammable fumigant with a TLV of 0.1 ppm (2000 ppm LD_{50} human). May be chosen as alternative to Methyl Bromide (see Horie 1983).

ROTENONE (Derris) Plant root extract. Short persistence. Low mammalian toxicity. Used as a dust.

From the above lists it may be clearly seen that difficulties exist in terms of the safe application of pesticides in the Museum context.These are summarised as follows:

A. In store areas where people are working, opening sealed units, browsing over collections, and where staff may be permanently stationed amongst collections.

B. The difficulties of applying constantly evolving safety controls, as TLV's and STL's move ever downwards.

C. The problems regarding the provision and use of safety facilities and equipment, and procedures. Masks, coats, gloves, fume cupboards, building ventilation and general pesticide containment.

D. The high cost of fumigation chambers and choice of fumigant.

E. The choice of insecticide.

It would appear that in view of these difficulties maximum use should be made of all non-chemical means of pest control. In the long term this must be safer and more economical considering also the damage which may be caused to objects by countless applications of different chemicals over the years.

The non chemical strategy that em erges is along the following lines:-

i) Clean, sound, building interiors and case structure. Double glazed windows, well sealed units.

ii) Good maintenance, regular cleaning.

iii) Regular inspection.

iv) Tight control over the input of material.

v) Steady medium humidity, ca 55% and Low temperature. (Many store rooms appear to be overheated for the comfort of personnel, whilst low temperature can be a major factor in reducing pest activity.)

vi) Properly screened ventilation.

vii) Alternative fumigation strategies. This is an area where much constructive work remains to be done. Workers in herbaria have demonstrated the viability of alternatives to chemical methods, and have shown freezing to be more consistently effective than Methyl Bromide. Very promising claims have been made regarding the killing of all stages of certain pest species. (Crisafulli 1980) and (Edwards 1981).

In the author's own preliminary control experiments using a conventional deep freezer, 48 hours at -20°C has proved lethal to all stages of *Anthrenus verbasci L.* (The Beautiful Carpet Beetle), infesting a bird corpse.

There are a variety of other techniques which may prove to be useful in terms of alternatives to dangerous chemicals.These include freeze dry and related vacuum techniques, pressure, heat and humidity combinations, as well as developments along the lines of relatively mild insecticide used in combination with dessicants (Edwards 1981 and Schofield 1980).

It would seem clear that the full potential of the preventative approach has not yet been realised.

Chemical fumigation.

At present a bewildering number of different strategies are in use in museums in the UK. Institutions may clearly need to carry out emergency fumigation of buildings, stores or objects. Some have fumigation chambers, and may circulate collections through the chamber on a continued basis. The careful fumigation of all incoming material may also be undertaken. There is disquiet regarding the choice of fumigant however, and urgent work is needed to resolve questions concerning reactions between fumigants and objects. (Methyl bromide versus Phosphine for example.)

Chemical protection.

Within stores, storage units and displays, almost every combination of the following approaches may be encountered -

a) Prior poisoning (Eulan, Merchuric chloride etc).

b) Vapona strip. Hung in cupboards, rooms, or cut into strips and pinned into drawers. Sealed into displays.

c) Vapona strip. Circulated on a systematic basis.

d) Naphthalene. As a repellent in trays, bags and in drawer cells.

e) Paradichlorbenzene. In trays, bags and drawer cells.

f) Mixtures of the above.

g) None. Regular checking, periodic fumigation of store, and environmental controls.

This is an area of such importance to the long term welfare of our collections and the health of museum workers that systematic study is urgently required in the formulation of strategies for wide adoption by institutions and professional groups.

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Editor. While this paper was being prepared numerous museum biology curators were approached to obtain some idea of their views and experiences with what turned out to be a bewilderingly varied selection of pest control strategies.

Naphthalene, one of the most widely used chemicals was reported by several people to produce a wide range of symptoms related to periods of exposure to very high levels. These include nausea, stomach pains and upsets, chest constriction and pain, headaches, sore throats and migraine onset. In one unusual example first one and, some weeks later another, small mammal died when left overnight in a room containing entomological collections with naphthalene.

There were also reports of allergic reactions amongst workers, although these are notoriously difficult to attribute to a specific source in any situation. In one case both staff and volunteers developed allergic sensitivity when working for any sustained time in a certain stora ge area. No pesticide is used at present in the collections which are protected by periodic fumigation of the building. Methyl bromide is used and residues of this could be responsible. Alternatively it could be traces of other materials (or combinations). However, despite extensive tests, the cause has not been traced.

If you have other observations concerning these chemicals, or constructive comments about pest control I would welcome them for inclusion in the Newsletter.

FURTHER TO THE NATIONAL BUTTERFLY MUSEUM SALE

F.R.Woodward

I noted with interest Steve Garland's comments on the recent sale of the National Butterfly Museum (formerly the Saruman Museum) by Sotheby's on 26 and 27 October 1983 and would like to make the following corrections and observations.

Firstly the sale did not take place in London but at St Mary's, Bramber, near Steyning, West Sussex, perhaps helping to explain the small number of public museums represented at the sale.

Secondly, I was not in the least surprised that most lots achieved sale prices far in excess of those estimated since a) the auctioneers were dealing with an unknown situation since specialist entomological sales of this kind have not taken place since at least the Second World War. (The Smart family World Butterfly Collection had previously been offered for sale by the National Butterfly Museum at Christie's South Kensington Salerooms on Friday 23 July 1982 at which sale Glasgow Museum purchased two ten drawer cabinets of lycaenids. The majority of the collection, however, was bought in by the Smart Family.)

b) Many of the entomological items were in first class condition, well documented or historically important

c) Auction fever played a part in that some lots were snapped up by locals purely as mementoes without any regard for true value? Similarly some books fetched higher prices than new copies currently on sale in most booksellers.

Regarding the reference to archival material, this is presumably to Lot 468 'The Siviter-Smith Papers', including an enormous correspondence over some twenty years between P. Siviter-Smith and virtually all leading entomologists of his day. Particularly interesting is the great contribution by H. A. Leeds with much unpublished material relative to "Copper" butterflies. Note books, photographs, drawings, etc, included show that Siviter-Smith intended to publish a substantial monograph. (Estimated price £20-£30.) This lot fetched £320 plus commission, but reflects the highly important scientific content of the lot and was, I understand, purchased by an entomologist currently undertaking a monographic revision of the Lycaenidae (Coppers and allies).

The walnut-faced fifteen-drawer cabinet refers to lot 995, The Gurney Cabinet, a mahogany and walnut fifteen-drawer entomological specimen cabinet by the famous maker T Gurney circa 1900. This contained the Smart British Butterfly Collection.

"Apart from a very few typical specimens the collection consists entirely of historic or aberrational forms spanning the last two hundred years. No attempt to detail this in what follows has been made - to select any insects for special mention at the expense of others would be a pointless exercise. It is sufficient to say that this is the most important assemblage of British material outside the British Museum (Nat Hist) and includes many forms unrepresented, or less completely so, in that institution.

Many of the specimens are well-known having passed through such famous

collections as those of Bright, Frohawk, Gainsford, Marcon, Turner, etc, a high proportion being the actual specimens figured in the standard works of South, Frohawk, Barrett, Howarth, Russwurm, etc. In total upwards of two-and-a-half thousand specimens - almost all in some way unique."

This lot fetched £11,000 plus buyers premium through a phone bid by a purchaser said at the sale to have been phoning direct from Japan. Professionally, however I regret that this scientifically and historic material passed once more into private hands with the eventual possibility of its being dispersed and leaving the British Isles since the material concerned has considerable British significance.

This brings me to the two interesting aspects of the sale from a museum viewpoint; firstly the star billing of type specimens. I see no disadvantages inherent in cataloguing such material in future natural history sales but question the attitude of museums in general to such occurrences.

How many museums, with the exception of the British Museum (Natural History), Brighton Museum, Dundee City Museum, or ourselves at Glasgow, took any active interest in the sale, or indeed what has been the attitude of the museum profession, with the exception of the B C G article to the sale?

This I realise is due to a series of factors such as individual collecting policies being restricted to definite limited areas; lack of specialist entomologists, reluctance to purchase Natural History material which in the past has been donated free of charge in contrast to our art collections.

However, I personally would argue that we also have a responsibility as representatives of public institutions to ensure that Natural History material of significant historical or scientific importance should, if at all possible, be taken into public ownership under our care to ensure its safety for future generations of scientists and public alike. Surely much of the material included in the present sale came within this category.

As regards the sale of types I accept that this tended to inflate prices in certain instances in the present case but what is the monetary value of safeguarding a primary type? This was offset by the ludicrous prices paid for some lots, as for example Lot 650 Garden butterflies, which fetched £540 plus buyers premium and seriously made me wonder why museum personnel have never considered setting up in business by themselves.

Regardless of the rights or wrongs, I purchased some nineteen lots containing type material of Lepidoptera together with further lots of foreign lepidoptera including many figured by Paul Smart, FRES in The Illustrated Encyclopaedia of the Butterfly World published in 1975. I also purchased the G R Sutton Collection of British Beetles, the Dr R M P Clark Collection of British Beetles and the H D Smart Collection of British Hymenoptera. In addition we purchased Lot 1005, "Specimens from two further expeditions sponsored by the museum, one to the 'Lost World' of Roraima in South America, the other that of Aberdeen University to Papua, New Guinea" (estimated price £70-£90).

This scientifically important material with strong Scottish connections was purchased for £40. This raises a further question, namely the attitude of and relationship between, museums, public bodies, such as universities or private individuals, carrying out scientific or taxonomic research. It seems a terrible misuse of available limited resources in these days of financial stringencies to waste valuable material, often obtained at high cost, through lack of coordination or foresight. Serious consideration should be given by us all, both museums and scientific organisations alike, to the future deposition of any expeditionary, experimental, or voucher material during the initial planning stages of all research projects. In the case of type material this is now partially covered by the recommendation of the International Commission of Zoological Nomenclature requesting that types should, if at all possible, be deposited in a public institution.

In regard to Steve's second point, namely the note concerning trade in protected species I personally have no doubt whatsoever that such additions provide a strong inducement to buyers to purchase a given lot. However, note the wording under 2 'any such specimens of butterflies, moths etc contained within the lots offered for sale <u>are deemed not to form part of that lot for sale purposes or valuation, such specimens being regarded in the nature of a gift</u> by the museum to any other museum, or responsible individual who shall purchase any such lot'. The important point is '<u>a gift</u> by the museum <u>to any other museum, or responsible individual who shall purchase any such lot</u>'.

At the sale the auctioneer made it quite clear that any such lots sold were subject to Department of the Environment regulations. For example, lot 1003 'Melanism as illustrated by the Peppered Moth <u>Biston betularia</u>.

The display consists of specimens drawn from the late Dr H D B Kettlewell's research material including most of the actual specimens figured in his famous paper in the Journal of Genetics, the paper models he made to test bird reaction and one of the original Hope Department boxes which contained part of the betularia material'. The purchaser of this lot required DOE clearance and registration thus helping to ensure that the material did not leave Britain and that its future location could be monitored.

In regard to the use of the words National and Museum I understand Steve's point but we should remember that all Public Museums owe their origin to Private collections or 'museums' thus the British Museum (Natural History) originated from those of Sir Hans Sloane, Joseph Banks, etc the Hunterian at Glasgow University from that of Dr William Hunter and that of the Royal College of Surgeons from Dr John Hunter.

The effect the sale has had on our public image is hopefully minimal but again brings home the point what have we or the Museums Association done to correct any misapprehension in the mind of the general public?

Finally as regards the fate of the other lots I understand many of the remaining type lots were purchased by the Allyn Museum of Entomology at Sarasoto, Florida, USA, Dundee Museum purchased some British material whilst Brighton museum obtained several of the Nymphalids to supplement their extensive collections of this group. As to the remaining lots many were purchased by individual specialists in the various groups thus at least, ensuring their survival for the foreseeable future.

F R Woodward
Depute Keeper
Department of Natural History
Glasgow

The Booth Bird Labels

a case for relabelling and cataloguing using a mini-computer

Gerald Legg, Keeper of Biology,
The Booth Museum of Natural History, Brighton.

In 1874 E. T. Booth opened his museum on the Downs in Brighton. This contained his life's work: a display of most of the British birds in cases fitted up to represent as far as possible their natural condition with their natural surroundings. On his death in 1890 the museum and collection were bequeathed to the town of Brighton. Since then other specimens have been added; so now there is a total of 476 cases of which 306 are original Booth cases.

Each case possesses a black-painted label bearing gold lettering, giving the common name of the bird(s) present, together with a small case number label. Several of these old labels have names which are either no longer valid or they are out-of-date. Catalogues of the cases were published in several editions, and these contain extensive information about each of the cases and the birds they contain. Copies of the catalogue are available for the public to use should they wish to know more about particular cases and birds.

This state of affairs was considered unsatisfactory and so in 1978 it was decided to provide further detailed information about each bird on labels in close proximity to the relevant case, a daunting task with 476 cases to deal with.

The production of the labels can be broken down into a series of stages:

1) design of the labels and the information they were to contain, how they were to be mounted and protected;
2) making a plan of the distribution of the cases throughout the museum;
3) writing out in case order, that is in the order in which the cases appear on display which is not necessarily the same as their number order, details of each specimen;
4) checking and editing the draft labels;
5) designing the label holders and contracting out their production;
6) entering the corrected draft labels on to computer discs;
7) checking the entered labels for errors;
8) printing the labels;
9) mounting the labels.

The draft labels were largely prepared by a supervised sixth-form student who was employed for a short time. Problems occurred with the firm that was producing the label-holders which resulted in considerable delay in the programme for relabelling. Details of the holders are given in Fig. 1.

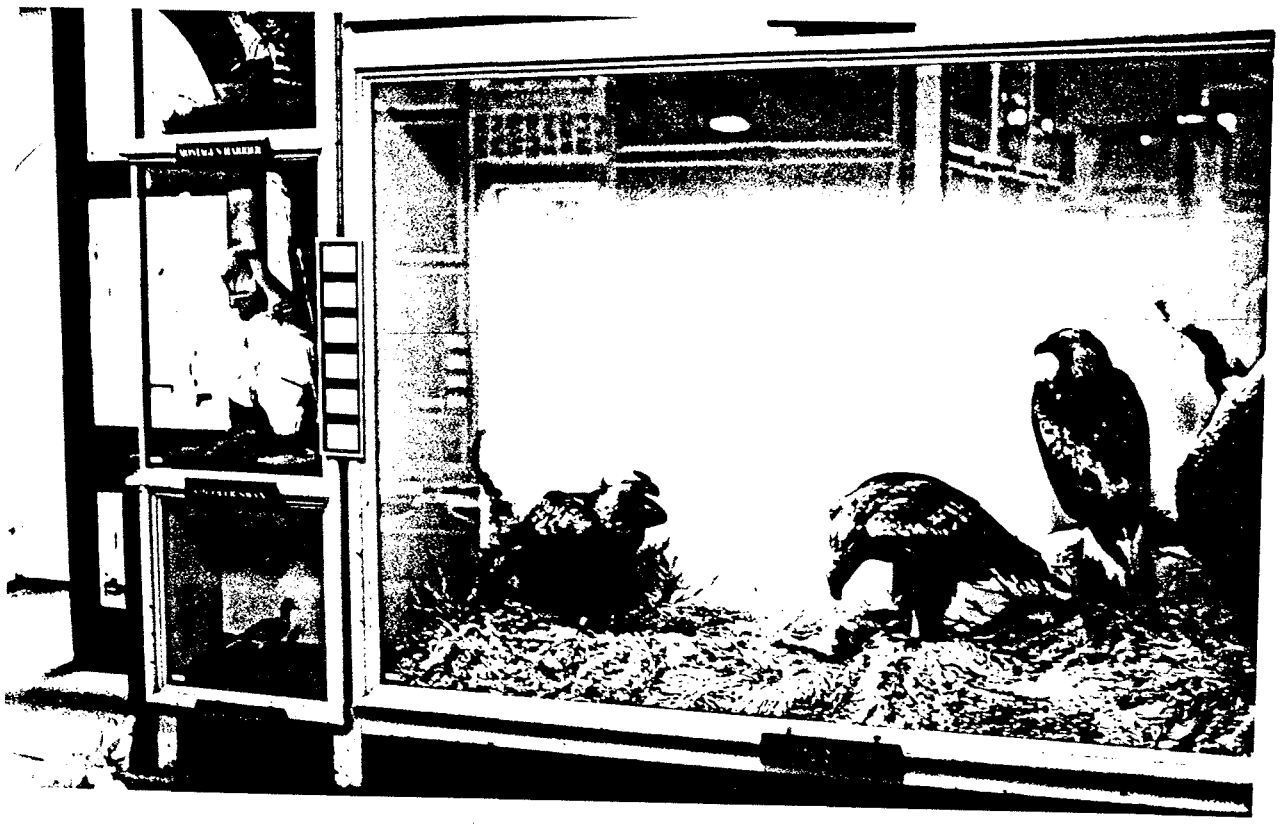
The large number of labels needed meant that they had to be both unobtrusive and also easy to read. Consequently it was initially decided to have them typed. Various type styles and layouts were tried and at one point it was intended to "Letraset" the English and Latin names using different type faces. This idea was dropped because it would have involved a great deal of extra work and expense.

Then in 1983 things changed. The museum started a Manpower Services Community Programme Scheme which was aimed at the production of catalogues of and indexes to the collections to be made available to the general public. To help with the work of the scheme an IBM personal mini-computer was purchased. By coincidence the relabelling of the Booth cases was ideally suited to the scheme. The availability of the IBM completely changed the ideas concerning production of the labels. It opened up other very beneficial opportunities: the production of indexes and catalogues which could be made available or even sold to the general public. Consequently, instead of typing the draft labels on an ordinary machine the data were entered into the IBM and stored on discs. Before this could be done suitable programmes had to be written.

The labels were initially stored in case order number so that they could be prepared more easily prior to putting them in their respective label holders. They were mounted in strips of 1, 2, 3, 4, 6, 7, 8 or 9, depending on their position and the number of cases being referred to (Plate 1). Once formated the data could be printed in a standardised way, an example is given below. Changes in format, alterations in text and corrections can all be easily made by calling up the relevant record on the computer and altering as appropriate and then reprinting the label(s) in question.

The labels were printed on an EPSON MX 100 III printer that interfaces with the IBM. To enhance the contrast of the final labels they were photocopied on a Xerox 2830 copier set on "darker copy". They were then trimmed to size to fit the holders, coated with "Library Film" (plastic self-adhesive film) to protect against dirt and handling, and then mounted individually in the "windows" of the label holders.

Once all the labels and their text were on file the data could be manipulated to produce a catalogue and series of different indexes (Linnean name, common English name, French and German names, etc.), see below.



Examples of Labels

323 BARN OWL variety — Tyto alba guttata
(N.& E.European dark breasted subspecie)
Chouette Effraie — Schleiereule

Status	Irregular vagrant
Distribution	N.and E.Europe
Habitat	Faraland,open country
Nest Sites	In barns,churches,hollow trees,but this subspecies not in Britain
Collected	Shoreham,Sussex,September 1901,October 1893.Rottingdean Sussex,November 1900.(for British subspecies see case 54)

370 GREAT SNIPE — Gallinago media

Becassine Double — Doppelschnepfe

Status	Annual vagrant
Distribution	Europe
Habitat	Stubble fields,heaths
Nest Sites	Marshy country,but not in Britain
Collected	Nr.Lewes,Sussex,October 1867.Coney Hill,Patcham.Sussex, Septeaber 1909.nr.Oxford,October 1867.Thorpe,Suffolk, August 1875:adult female

Examples of Indexes

REC#	CASE	ENGLISH NAME / ALT ENG NAME	LINNAEAN NAME / NOM FRANCAIS	DEUTSCHE NAMEN
37	483	WILD CANARY	Serinus canaria	
38	476A	DUSKY THRUSH	Turdus naumanni eunomus	
			Grive a Ailes Rousses	Rostflugeldrossel
39	360	WOODCHAT SHRIKE	Lanius senator badius	
		(Corsican Woodchat)	Pie-Grieche a Tete Rousse	Rotkopfwurger
40	343A	CRESTED LARK	Galerida cristata	
			Cochevis Huppe	Haubenlerche
41	440A	BLACK-HEADED WAGTAIL	Motacilla flava feldegg	
		(subspecies of Yellow Wagtail)		

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ENGLISH NAME	ALT ENG NAME	CASE
ALPINE SWIFT		361A
AMERICAN BITTERN		371
AMERICAN WIGEON		052
ARCTIC SKUA		221
ARCTIC SKUA		224
ARCTIC TERN		206
ARTIC SKUA		227
ARTIC TERN		203
AVOCET		372
BAILLON'S CRAKE		390
BAR-TAILED GODWIT		144
BAR-TAILED GODWIT		147
BAR-TAILED GODWIT		151
BARN OWL	(N.& E.European dark breasted subspecie)	223
BARN OWL (white-breasted subspecies)		054
BARNACLE GOOSE		401
BEAN GOOSE		081
BEARDED TIT (BEARDED TITMOUSE)		032
BEARDED TIT (BEARDED TITMOUSE)		040
BEARED TIT (BEARDED TITMOUSE)		037
BEE-EATER		364
BEWICK'S SWAN		232
BITTERN		069
BLACK BRENT GOOSE	(North Pacific form of Brent Goose)	396A
BLACK GROUSE		068

LINNAEAN NAME PAGE 2

LINNAEAN NAME	ENGLISH NAME	CASE
Athene noctua	LITTLE-OWL	352
Athene noctua	LITTLE-OWL	352X
Aythya ferina	POCHARD	105
Aythya fuligula	TUFTED DUCK	196
Aythya marila	SCAUP	111
Aythya nyroca	FERRUGINOUS DUCK	434
Bartramia longicauda	UPLAND SANDPIPER	314
Bombycilla garrulus	WAXWING	363
Botaurus lentiginosus	AMERICAN BITTERN	371
Botaurus stellaris	BITTERN	069

02-06-84 NOM FRANCAIS PAGE 1

NOM FRANCAIS	CASE
Accenteur Mouchet	028
Agrobate Roux	452
Aigle Royal	305
Aigle Royal	306
Aigle Royal	001
Alouette Calandre	346A
Alouette calandrelle	342A
Alouette des Champs	166
Alouette des Champs	169
Alouette Leucoptere	345

02-06-84 DEUTSCHE NAMEN PAGE 1

DEUTSCHE NAMEN	CASE
Alpenkrahe	096
Alpenschneehuhn	074
Alpenschneehuhn	077
Alpenschneehuhn	080
Alpensegler	361A
Alpenstrandlaufer	300
Alpenstrandlaufer	302
Alpenstrandlaufer	301
Amerikanische Rohrdommel	371
Amsel	175

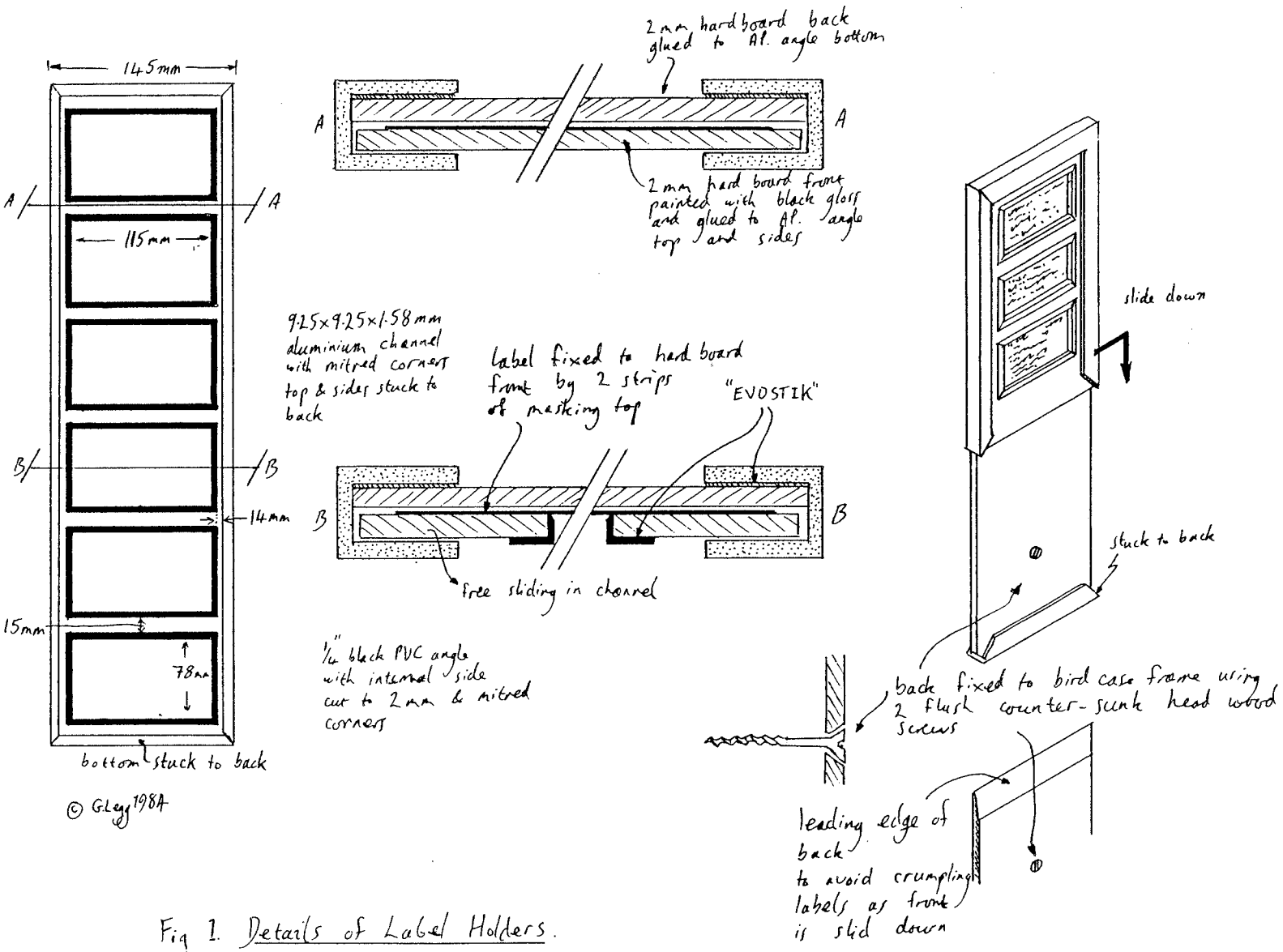


Fig 1. Details of Label Holders.

ZOO LICENSING ACT ; 1981

IMPLICATIONS FOR MUSEUMS WITH LIVE ANIMAL DISPLAYS

G.M.Reid

In what way are Museums affected ?

The Zoo Licensing Act, which is primarily concerned with the welfare of captive wild animals, came into effect on 30th April, 1981. The Act requires that zoo operators obtain a license. Many Local Authority Museums have living animals on display in public aquaria, vivaria, observation beehives, formicaria, aviaries and so forth. Some Museums also have attached to them extensive set-ups in the form of Farm-Parks, which may include a wide range of livestock and incorporate a 'pets corner'. Clearly, establishments with this kind of display might broadly be considered as 'zoos' and - depending on the nature and extent of the living collection - may need to be licensed. There could also be long term implications from licensing in terms of the future display and development policy of Museums with living creatures on show.

The terms of the Act (and the ancillary documents supplied by the Department of the Environment) reflect the prevailing view of the National Federation of Zoological Gardens that the main aims of a zoo are:

- Recreation for the public, through seeing and understanding the natural world
- Education of the public about animals, their natures and needs
- Conservation of all animals, but particularly those under threat of extinction
- Scientific study, to learn more about the biology of wild animals

These aims are in general agreement with the natural history display, conservation and research policy of many Museums. Indeed, on the environmental and species conservation front, it could be argued that many Museums surpass most Zoological Gardens in terms of educating the public. By inference, the Act is designed to ensure the proper care of animals in captivity through the maintenance of good standards of animal management and the improvement of these standards; and, by doing so, further the cause of wildlife conservation.

A Committee on the Implementation of the Zoo Licensing Act has been set-up by the National Federation of Zoological Gardens,

Regent's Park, London, NW1 4RY (Tel: 01 586 0230). The main aim of this committee is to monitor the implementation of the Act, to provide advise and to note any problems which might arise. Names, addresses and telephone numbers of committee members are available from the Federation.

What documentation is required ?

The International Branch, Department of the Environment, are responsible for administering the Act. Mr. D. B. Leeming (Room 11/02, Tollgate House, Houlton St., Bristol BS2 9DJ. Tel: 0272 218 291) has special responsibility for documentation and licensing. This Section of the DOE will supply your Museum with:

- Guidance notes about the Act
- The Secretary of State's Standards of Modern Zoo Practise
- The Secretary of State's List Part I: Approved Veterinary Surgeons
- The Secretary of State's List Part II: Competent Inspectors
- Application form for a Zoo Licence (existing zoos)
- Form for Notice of Intention to Apply for a Zoo Licence (notice to the press)
- Form for Notice of Intention to Apply for a Zoo Licence (notice to the local authority)
- List of Legislation of possible relevance to a zoo operation
- Note on Services and Expenses for Persons on the Secretary of State's List (Veterinary Surgeons, Inspectors)
- Note on Environmental Education in Zoos

While most of the above documents arise out of the Act and will allow an application to proceed, actual copies of the Zoo Licensing Act (and of ancillary legislation) are not supplied - these may be required by your Museum or (in cases of consultation) the Museum's solicitor or appointed veterinary surgeon. The DOE point out in the Introduction to their 'Guidance' notes that 'Nothing in this document is to be taken as constituting an authoritative legal interpretation of the Act or to be regarded as a substitute for the text of the Act.' Other documents available from the DOE, while not directly affecting the licensing process, may help in interpreting the Act or have a bearing on a Museum's zoo operation:

- The Dangerous Wild Animals Act, 1976 (Modification) Order 1984
- Notice on Controls on the Import and Export of Endangered

and Vunerable Species (April, 1984)

There is also an important consultative document, prepared by the Health & Safety Executive, on aspects of health and safety in zoos, which is designed to supplement provisions in the Licensing Act:

. Transfer of Health and Safety at Work etc. Act, 1974, enforcement responsibility in respect of zoos to Local Authorities (Draft regulations, Approved Code of Practice and Guidance notes) [1984: cost £2. 50]

COMMENTS ON GUIDANCE NOTES

Key provisions [2]

In brief: there is a legal requirement under Section 1 of the Act to obtain a license. Special provision for Local Authority Zoos is made in Section 13. Dispensations for small zoos with only a few different kinds of animal may be granted by the Secretary of State under Section 14. Special 'transitory provision' for existing zoos is provided by Section 20. The Dangerous Wild Animals Act, 1976 is amended in Section 23.

Who to apply to ? [3]

The Chief Executive, of your Local Authority, normally for the attention of the Environmental Health Dept. It may be useful to make informal enquiries to Environmental Health before submitting an application.

When to apply ?

The deadline for applications to be with the DOE is 30th Oct 1984.

Separate or joint 'Museums Dept.' application ?

Museums with more than one branch and separate 'zoos' can consider either a joint application or, as appropriate, separate licensing. In the latter case, a failure of one in obtaining a license would not affect the other.

What constitutes a 'zoo' ? [4]

According to the Oxford English Dictionary: 'Public garden or park with a collection of animals kept for exhibition'. But for the purposes of the Act 'animals' means wild or exotic creatures (including fishes, reptiles, amphibians and invertebrates) not normally domesticated in the U.K. Farm animals are, therefore, exempt including rare breeds. This means that a Farm Park does not necessarily qualify as a zoo. However, if display policy dictated that 'farm' animals such as wild boars, oxen or llama were to be kept, then the DOE would regard such a set-up as a zoo. Similarily, if a 'pets corner' at a Home Farm contained gerbils or racoons (the latter now

scheduled as a dangerous wild animal) this would nudge it into the zoo domain. Domestic bees are not zoo animals, unlike wild bees, ants, butterflies, stick insects, spiders and snails (all commonly kept in living Museum displays).

Are there exemptions from licensing ? [5 and 43-44]

Yes, (under Section 14) for small zoos exhibiting only a small number of different kinds of animal. This provision is designed to accomodate the 'fish tank in a pub' situation and will probably apply to small museum aquaria, vivaria, beehives, formicaria, aviaries, etc. It is unlikely that exemption would be gained in the case of:

. a large and varied collection

. inclusion of dangerous wild animals and rare or vunerable species

Even if exemption is applied for and gained, any establishment holding dangerous wild animals, which is not licensed as a zoo, needs to register under the Dangerous Wild Animals Act. In any event, dispensation cannot be automatically assumed, it must be applied for. Farm Parks, containing domestic animals only, will probably be exempt - but this point needs to be checked with the Local Authority. Specimens in transit from the 'zoo', or in temporary displays away from 'base', also come under the new regulations.

What procedure applies ? [6-17 and 49-52]

In the case of an established zoo the 'Notices of intention to apply' for press and local authority are waived: provided the application is made before the October deadline, i.e. within 6 months of commencement of the Act.

The Local Authority will consider the application, using persons included in the Secretary of State's list (i.e. Vets and accredited Inspectors). The licence is granted or refused following inspection. Refusal would normally be on grounds of 'accommodation, staffing or management inadequate for the proper care and well being of the animals' or where there were threats to the health and safety of the public. Prior conviction of a 'keeper' for cruelty to animals, could constitute grounds for refusal or revocation of a Licence. Contravention of other relevant legislation, such as the Wildlife and Countryside Act or the Health and Safety at Work Act might also provide grounds for refusal. If adequate standards are not met but there are plans to quickly remedy matters then a conditional Licence might be granted.

If a Licence is granted a copy must be displayed at each public entrance to the zoo.

How long does the licence last and what conditions apply ? [19-21]

The first licence is 4 years, subsequent licences for 6 years.

The Licence is conditional on:

. proper housing to prevent escapes. Cages or tanks containing rodents, scorpions, spiders and snakes fishes merit particular attention.

. proper stock records being kept. A formal Register of Births, Deaths, Disposals and Escapes is required. The DOE advise me that records are not normally required for animals which are not 'individually identifiable' (e.g. colonies of bees or mice, shrimps, shoals of small, common fishes). Records are, however, required for 'notable species' by virtue of size, rarity, value or hazard (e.g. in the case of aquaria: shark, arapaima, large pacu, prize tropical marine specimens). Notice is also required of mass mortalities and unusual deaths. There is also emphasis in the Standards on ease of information retrieval. There are, then, advantages in the medium or long-term in computerising records.

. insurance against liability for damage caused by animals. Liability is not always clear, particularly with regard to escapes of Dangerous Wild Animals (e.g. buthid scorpion). Also, the extent to which members of the public are covered during behind-the-scenes visits should be checked. From time-to-time dangerous wild animals and vunerable species are referred to Museum zoos/aquaria by organisations such as the Police, RSPCA, Customs & Excise, fruit importers. The Museum's position as a public holding facility for such creatures may require clarification.

What constitutes a dangerous wild animal ? [22-25]

During the process of licence renewal the attention of the Local Authority is particularly drawn to additions of 'dangerous animals'. A recent (1984) modification order updates the original list of animals scheduled in the Dangerous Wild Animals Act, 1976. The new List does not include non-poisonous snakes, tarantulas, cone shells, scorpion fish, stinging weever fish, pirhanas or sharks (all of which are, or could be, included as aquarium or vivarium exhibits), but does include crocodiles, certain venomous spiders and buthid scorpions. The reason for the broad exclusion of obviously 'hazardous aquatic life', such as sharks or venomous fishes, is because the method of containment limits the danger of exposure to the public.

Hazards to staff dealing with such creatures are covered under the HASAWA, 1974, as qualified in the recent (1984) consultative document. The Health & Safety executive takes a broader view of hazardous animals and includes any which 'are likely to injure seriously or transmit disease'.

How are inspections conducted ? [27-45]

There are three kinds of Local Authority inspection: periodical, special and informal. Periodical Inspections are prearranged and carried out by a team of three appointees of

the Local Authority (including a veterinary surgeon) plus two nominated by the Secretary of State from his List. 'The inspection will cover all features of the zoo which are directly or indirectly relevant to the health, welfare and safety of the public and the animals, including measures for the prevention of the escape of animals. This will involve matters concerning staff insofar as such matters relate to the above-mentioned features. The inspectors will require to see any records...' Special inspections or informal inspections are at the instigation of the Local Authority.

The Museum is liable to pay the costs of an inspection.

It should be noted that Local Authority Museums may be liable to independent inspections by the HSE (principally HM Agricultural Inspectorate). The HASAWA consultative document on zoos (1984) proposes that enforcement responsibility for the Act be transferred from the HSE to the Local Authority. However, it is also proposed that the HSE will remain the enforcing power in cases where the Local Authority itself runs the zoo.

NOTES ON THE STANDARDS

Animal care-accomodation [1-6]

'Animals to be provided with space and furniture sufficient to allow such exercise as is needed.' The arrangements for livestock should be checked, e.g. boa constrictors require an enclosure which is up to standard, i.e. about 8 ft square or more.

Animal care-comfort and well being [7-8]

'tanks for aquatic animals to be....heated according to the needs of the species'. For 'heated' also read 'cooled'. It is not uncommon to see aquarium displays of local marine and freshwater life which are inadequately chilled. If creatures are are at their threshold limits of tolerance an inspector might well note this fact.

Equipment within enclosures [9]

'in the case of aquatic animals materials such as weed, shingle etc, [to be supplied] to aid and encourage normal behaviour patterns'. This highlights the use of decorative materials in tanks to create a naturalistic effect. It is no longer sufficient to place fishes and other creatures in a 'box of water' some effort must be made to create an environment in which they will feel secure.

Prevention of stress or harm to animals [10-17]

'Smoking by zoo staff to be prohibited when they are working in

close proximity to animals or when they are preparing food for animals.' 'No Smoking' notices would be advisable for staff, contracters and the public.

Animal care - food and drink [18-26]

'preparation of food...to be undertaken in a separate unit ...used for no other purpose'. Points up the problem of staff changing their clothes, washing their hands and having their lockers in a preparation area.

Sanitation and control of disease [27]

'regular monitoring of water quality' is now an obligation for aquatic animals

Animal care-Veterinary facilities [34-50]

'arrangements to be made for routine veterinary attendance.' It is often the case that aquarium and vivarium staff deal with quarantine and disease problems as they arise. However, it is now the case that the Museum must hire a 'zoo vet', possibly someone from the Secretary of States List. Visits by the Museum's appointed vet may be required as often as every one or two months, depending on the nature of the living collection.

'protective clothing and utensils used by staff...to be cleaned and stored only in the isolation [quarantine] area.' Raises again the question of staff work clothes and changing areas.

'except under the direction of a veterinary surgeon or practitioner, members of the staff of the zoo not to possess or administer controlled drugs.' Many medicines used in aquara and vivaria are commercially available preparations and not obtained by pharmaceutical prescription. These should, nevertheless, be locked in a steel cabinet in a safe place.

Post-mortem facilities [51-55]

'the cause of death for each animal dying in the collection to be estabished where reasonable and practicable to do so, including, in the majority of cases, the examination of carcases by a veterinary surgeon or practitioner.' Formal arrangements can possibly be made with the Museum's appointed vet or the Veterinary Pathology Department of a local University. Even so, for lower vertebrates the cause of death is often difficult to ascertain by post-mortem. It may be advisable to retain specimens entered in the 'Deaths Register' in a deep freezer until veterinary clearance for disposal is obtained. Those Museums with a Taxidermy laboratory will be (or should be) covered in terms of post-mortem facilities. One must ensure that arrangements for the disposal of offal are satisfactory.

Safety and security-enclosures [56-60]

Cages and tanks should be checked for security and

double-checked if they contain hazardous creatures. It may be advisable to have some kind of special cover (? fine mesh frame, heavy glass sheet) over tanks containing venomous fishes, especially the Lion Fish. In addition to this, hazard warning signs should be placed at sites of risk It may also be advisable for a routine warning on all hazards (animals, pipework, walkways) either written or verbal to be given to members of the public prior to behind-the-scenes visits, in order that they proceed with suitable caution.

Escape of animals [87-95]

'procedures to be adopted in the event of escapes of hazardous animals to be brought to the attention of, and available to, all members of staff in a written document.' Snakes and other creatures may escape from time-to-time. Even if not actually dangerous, they can put the public in a state of fear and alarm. The written document should detail the chain of command in cases of escapes (names, telephone numbers), the location of any equipment needed to safely effect recapture, the procedure for closing off a gallery and the circumstances under which that gallery will reopen. For example, what is to be done if a buthid scorpion gets loose and cannot be found ? It is suggested in the Standards that emergency practise drills be carried out at least four times per year.

Emergency first aid [105-108]

Formal first aid procedures need to be established with a local hospital in the event of damage or injury caused by animals. Possible hazards include:

- venomous snake bite
- venomous fish sting (lionfishes, weevers)
- buthid scorpion sting
- bites and scratches (rodents, non-venomous snakes, pirhana, snapping turtle, crocodile)
- irritant hairs, minor stings (tarantulas, insects, marine worms, corals)
- stabs from fish spines (sting ray, catfish)
- poison dart (textile cone shell)
- electric shock (electric eel, electric catfish, electrical equipment in water)

Consultation may be required with the nearest Tropical Diseases Hospital to ensure that any necessary anti-venoms are available. In the case of toxic injury from marine creatures, there is a comprehensive work, which provides clinical details, by B.W. Halstead (1970) 'Poisonous & Venomous Marine Animals' (U.S. Govt. Printing Office, Washington D.C.). It might be useful for larger aquaria to order a copy of this

and photocopy relevant sections so that they are readily available. These clinical notes would travel to the hospital with an injured person.

Insurance against liability for damage or injury caused by animals [114]

Is your institution covered ?

POINTS FOR ACTION

Here are some of the things which your Museum may need to do:

Copy of DOE documents to be obtained

Copy of transfer of HASAWA, with respect to zoos to be obtained

Copy of Note on Environmental Education to your Museum Education Service

Copy of your current publicity leaflet to DOE

Copies of Zoo Licensing Act and Dangerous Wild Animals Act to be obtained from Govt. Printer. Copies available for Museum´s solicitor or appointed vet.

Application form for a Zoo Licence (existing zoos) to be completed

Informal enquiry to Environmental Health Dept. of Local Authority regarding responsibility for organising licensing process

Consultation with Solicitor/Museum´s insurers over liability for damage caused by hazardous animals to public or staff.

Formal arrangement to be established with local Hospital and/or Tropical Diseases Hospital in the event of injury from hazardous animals

´Emergency procedure´ to be produced as a staff document [in line with points 105-108 of the Standards]. Copy of Halstead´s ´Poisonous and venomous marine animals´ to be obtained and the relevant sections copied to be kept handy for transmission to Hospital in the event of an accident.

´Escapes procedure´ to be produced as a staff document [in line with point 91, 92 of the Standards] and procedure and timing for four emergency drills per annum to be established

Cages or tanks containing hazardous creatures to be inspected for security, especially those containing snakes, spiders, scorpions or venomous fishes. Where necessary, orders to be placed for joinery work, glass or perspex covers, safety latches, clips, netting etc.

Arrangements to be made for routine veterinary attendance [points 36, 47, 48 of the Standards]

Stock records of 'Deaths, transfers and arrivals' to be established [points 115-119 of the Standards]

Arrangements to be made to inspect and take action on specimens too closely confined in their tanks or cages

Action to be taken on any oustanding problems with defective electrical works, ventilation and lighting with regard to comfort and well being of stock [points 7,10,40 of the Standards] and of the staff

Provision to be made for staff changing, locker and washing facilities [point 20,c of the Standards] and in line with HASAWA consultative document

Order to be placed for a series of hazard warning signs. For example: STAY CLEAR HAZARDOUS ANIMALS: AUTHORIZED STAFF ONLY; DO NOT LEAN ON THE BARRIER. [points 59, 103 of the Standards]

'NO SMOKING or EATING' signs to be placed in preparation rooms

Consideration to be given to sites for public display of Zoo Licence (Museum entrance or Zoo entrance/exit ?). Arrangements to be made for mounting and fixing of notices.

In connection with improvements to Records, consider the long-term advantages of computerising stock lists etc.

Gordon McGregor Reid,
Conservation (Natural History),
Merseyside County Museums,
William Brown St.,
LIVERPOOL L3 8EN
[Tel: 051 207 0001 ext. 218]

Licence to Possess an Illegally Killed Bird

Derek Whiteley
Sheffield Museum

The following notes are intended as a guide for B.C.G. members who may wish to retain illegally killed specimens, found in good faith.

Earlier this year we received a rather fine corpse of a Lapwing found by a reliable local ornithologist in a farmer's field. The bird had a small gunshot wound, but otherwise the skin was in excellent condition, so it seemed a shame to refuse the specimen.

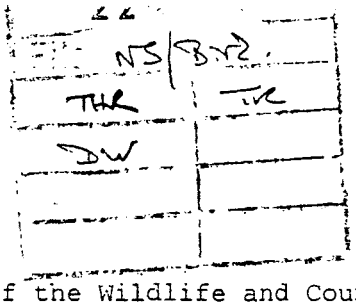
Seeking advice from the R.S.P.B., I received a very useful letter from Miss Penny Tedder, Co-ordinator of the Species Protection Department (Royal Society for the Protection of Birds, The Lodge, Sandy, Beds., SG19 2DL) who suggested that I contacted the Department of the Environment at Bristol.

Peter Heath, of the Wildlife Division, replied to say that the R.S.P.B. were right to refer me to the D.ofE. and that a licence would be required. My final letter to (the attention of) Miss Mugridge contained the following details of the bird:-

1. Species, age, sex
2. Collection locality, collector, date
3. Injuries sustained
4. Date of provisional acceptance by the Museum and temporary identification number (Entry form no.)

A licence was granted shortly afterwards which allocated the bird a unique number.

Department of the Environment
Directorate of Rural Affairs



WILDLIFE AND COUNTRYSIDE ACT 1981
LICENCE TO POSSESS ILLEGALLY TAKEN BIRDS

1. This licence, granted under Section 16(1) (a) of the Wildlife and Countryside Act 1981 by the Secretary of State for the Environment after consultation with the Nature Conservancy Council, is valid in England and Wales and authorises -

the keeping, by the City of Sheffield Museum, Weston Park, Sheffield, of an adult male vanellus vanellus (Lapwing) which had been shot in contravention of Section 1(1) (a) of the Wildlife and Countryside Act 1981.

2. This licence is subject to the following conditions:

a. The bird must not be sold (which includes hire, barter and exchange).

b. The bird must not be moved from the premises of the City of Sheffield Museum without the authority of the Secretary of State for the Environment.

Signed
Authorised by the Secretary of State
for the Environment
to sign on his behalf

Department of the Environment
Wildlife Division
Tollgate House
Houlton Street
Bristol
BS2 9DJ

16 August 1984

This is an example of the licence content. Certain characteristic administrative marks have been removed for security reasons.

ARTHUR HALL: BUTTERFLY COLLECTOR

Arthur Hall was born in 1873. He lived in Croyden, Surrey, and later moved to Brighton, Sussex. Shortly after his twenty-first birthday he went to Europe on a touring holiday with a friend. It was at this time that Hall appears to have started collecting natural history specimens. He had a wide interest in natural history and collected both plants (mainly British) and Lepidoptera. His real interest lay with butterflies and although concentrating on the Nymphalinae he also collected and studied members of the other butterfly families. During his life he built up a large collection (some thirty cabinets) which is housed at the Booth Museum of Natural History, Brighton.

His collection contains in the region of 650 types, many described by Hall himself, in addition to figured and voucher specimens. Many of his specimens are to be found in most of the major world entomological collections including the British Museum (Natural History) and the Allyn Museum of Entomology, Florida.

Hall obtained the bulk of his specimens through exchange with and purchases from other contemporary collectors such as Talbot, Joicey, Rosenberg, Staudinger and Geist. Other specimens were bought at natural history sales (particularly Stevens). However, much of the South and Central American material was obtained in the field by either Hall or his hired native assistants. In all, Hall made thirteen trips to the Americas between February 1901 and February 1939. Most of the trips are chronicled in a series of diaries. The trips lasted from between two and five months and they were paid for by Hall who worked during the intervening periods and saved up his earnings. Even in Hall's day such trips were expensive and his trip to South America of 1919-1920 cost him £847 13s. 10d. World War I interrupted his collecting and Hall was enlisted into the Army where he rose to the rank of sergeant.

In 1906 he was elected a Fellow of the Royal Entomological Society of London and he remained a Fellow for forty-one years. Then in 1947 there was an increase in subscriptions and Hall wrote informing the Society of his decision not to pay!

Between 1917 and 1940 Hall published many papers on South American Lepidoptera. He also wrote his 54-volume Monograph and catalogued his extensive collection.

On his death in 1952 his collections of insects, British plants, books, diaries, notes, catalogue and monograph were given to the Brighton Museums.

Unfortunately Hall never published his monumental 54-volume monograph and it remains in hand-written manuscript form, illustrated by many fine original coloured figures. In 1980 it was decided to make this useful and important work more generally available for those working on the Nymphalinae. To produce a 6,000 page set of paper-bound volumes would be prohibitively expensive and the only viable alternative was to publish the monograph in fiche. The entire monograph was reduced to 180 'pages' of fiche and is available at cost price from the Booth Museum for £70, including postage and packing. Further details concerning the Monograph can be obtained from Dr. Gerald Legg, Keeper of Biology, The Booth Museum of Natural History, 194, Dyke Road, Brighton, BN1 5AA, England.

Dealers in Natural History, London 1822

Today there are few dealers that specialise exclusively in natural history objects. One might hopefully conclude that the decline in man's acquisitive nature has been matched by a concomitant development of his inquisitive character. Unfortunately, dealership in some taxa has been driven underground by legislation.

In the nineteenth century, however, natural history dealers flourished in Britain; they formed an essential link between the traveller and the dilettante collector who, through lack of commitment or means, was unwilling or unable himself to collect or finance others to do so.

The natural history collecting craze became almost self-generating; the growth in demand for items made dealership lucrative and the existence of more dealers made collecting by the casual traveller the more attractive. The greater the supply of material the greater the number of dealers who could earn a living from trading. Inevitably, supply would outstrip demand and Dance (1966) lists a number of shells which fell in value as more specimens were found. The temptation both to dealers and travellers to preclude or counteract falling prices by making each specimen more individual must have been strong and there is no doubt that deliberate misidentification and false locality data were used to this end. Dealers also often resorted to publishing the description of new species based on inconsequential differences. Although their taxanomic stance can be justified in hindsight I suspect that originally much of it was for gain and a comparison of those which indulged in this "splitting" as opposed to those who preferred "lumping" i.e. the oversimplification of specific characters, were for the most part dealers.

Whatever the true intentions of the dealer he was an essential link between the traveller and the collector. William Swainson (1822) recognised this in his Naturalists' Guide and after detailed description of how to collect the specimens he included a list of dealers. It is worthy of note that at that time there were nearly 25 in London alone; a clear indication of the considerable demand for their services. The preponderance of dealers in birds and shells probably reflects Swainson's own preferences but can, therefore, be regarded as virtually complete, at least for the capital. The rather flattering comment about Humphrey, although arguably justifiable, owes much to Swainson's contact with him as a boy.

P.Lingwood

Dance, S. P., 1966 - Shell Collecting, An Illustrated History, London.

Swainson, W., 1822 - The Naturalists' Guide for collecting and preserving subjects of natural history and botany, London. (p67 and 68 of the Appendix are reproduced opposite).

LIST OF DEALERS, &c.

IN OBJECTS OF, OR CONNECTED WITH, NATURAL HISTORY.

THIS list will be useful, not only to those who reside in London, but such as occasionally visit it. But by far the most considerable number of shells, both in variety and perfection, may be procured at Mr. Mawe's, No. 149, Strand; and of birds, at Mr. Leadbeater's, Brewer Street, Golden Square.

SHELLS.

Mr. GEORGE HUMPHREY, *Leicester Street, Leicester Square*; the father of Practical Conchology in this country.
Mr. GEORGE B. SOWERBY, *King Street, Covent Garden.*
Mr. BULL, 124, *Leadenhall Street.*
Mr. BEARCLEY, *Newington Causeway.*
Mr. DANTZIGER, 23, *Greek Street, Soho.*
Mr. FOY, *Shoe Lane.*
Mr. MARCUS HYAMS, *Regent Street.*
Mr. HYAMS, 54, *Holywell Street, Strand.*
Mr. HARWOOD, *Houndsditch.*
Mr. EALING, *Butt Lane, Deptford.*
Mr. LATHAM, *Old Compton Street.*
Mr. NOSADA, *Coventry Street*; also in Prints, Drawings, &c.

Mr. NOSADA, jun., 27, *Warwick Street, Golden Square*; Curiosities, &c.
Mr. RATLEY, *Duke's Court, St. Martin's Lane*; Microscopic Objects, Minerals, &c.
Mr. RYALS, *John Street, Clerkenwell.*
Mr. STUCHBURY, 3, *Dove Court, Old Jewry.*
Mr. THATCHER, *Newman Street, Oxford Street.*
Mr. TURNER, 215, *Whitechapel Road.*
Mr. WILLIS, 120, *Chancery Lane.*
Mr. WATERWORTH, 105, *Houndsditch.*
Mr. NIGHTINGALE, 143, *Leadenhall Street.*
Mr. WHITE, 12, *Cross Street, Newington Butts.*

BIRDS.

Mr. B. LEADBEATER, Animal Preserver to the British Museum, 20, *Brewer Street, Golden Square.*
Mr. KEMP, 37, *Northumberland Place, Commercial Road*; live and dead Birds.
Mr. TURNER, 215, *Whitechapel Road*; ditto.
Mr. WILLIS, 120, *Chancery Lane*; Shells and Curiosities.

INSECTS.

Mr. LATHAM, *Old Compton Street.*
Mr. RATLEY, *Duke's Court, St. Martin's Lane.*
Mr. STUCHBURY, 3, *Dove Court, Old Jewry.*

The Entomologist may be furnished with every kind of apparatus necessary by application to

Mr. SAMOUELLE, through Mr. T. BOYS, 7, *Ludgate Hill.*
Mr. TUTHER, *Queen Street, Russel Square.*

EARTHLIFE

POSTERS TO SAVE A RAINFOREST

Earthlife is helping save Korup - one of the last virgin rainforests in Africa. Every minute 35 acres of tropical rainforest fall under the axe. Tropical forests are vital to the environmental and climatic stability of our planet yet nearly a half have been disrupted or destroyed in the past thirty years. There are few opportunities to be able to help conserve particular rainforests - but you can help Korup.

Korup, covering 350 square miles in the Central African Republic of Cameroon, is one of the richest forests in the continent. The abundance of its wildlife is remarkable - with over 500 tree species, 250 bird species, 39 species of amphibian and 14 species of primate. For many African animals Korup is their last forest-home - the Forest Drill, Preuss's African Colobus Monkey, the Pygmy Chameleon, the Hairy Frog and the Pygmy Flying Squirrel are but a few. Research into the forest's plant life has had fascinating results. Korup's trees are particularly rich in chemicals to defend themselves against insects and other predators. Over 100 compounds have been isolated, 40 of which were completely unknown before. Many could become the insecticides, analgesics, anti-bacterial and even anti-cancer agents of the future.

Korup is the first of 3 National Rainforest Parks scheduled by the Cameroon government in its National Development Plan.

The Earthlife Foundation is raising funds to help this important initiative to demonstrate the value of a rainforest reserve working as a vital renewable resource. The park programme, co-authored for Cameroon by Earthlife trustees, includes the husbandry of alternative protein sources by forest people, continued research into potential commercial uses of forest resources and development of agro-forestry schemes in buffer-zones around the forest perimeter.

Earthlife has produced a colourful poster showing a computer grid-map of the forest area. Each of its 60,000 squares represents 7 acres with some 1,000 trees. Every £10 donation sponsors a forest square and each donor is sent a poster with their sponsored area/s individually marked.

PLEASE HELP BY DISPLAYING THE POSTER & LEAFLETS FOR YOUR VISITORS.

Contact Earthlife Foundation, 10 Belgrave Square, London SW1X 8PH, Tel: 01-235 7055

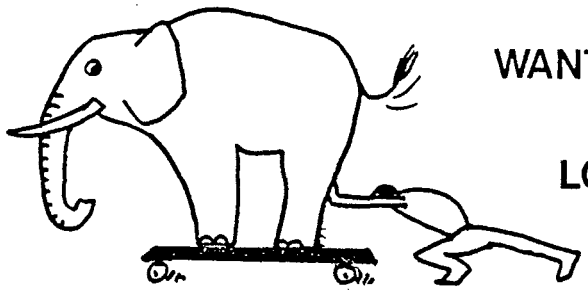
NATIONAL SOUND ARCHIVE

Making Soundings: An Appeal for Information on Sound Collections

Although the advent of video is exciting and widespread, sound recordings still represent a valuable resource to which there is only limited access. In many fields the tape-recorder is still the least intrusive, most effective means of capturing the essence of an event. Despite the apparent dominance of visual images, sound remains the most efficient, transportable, and exciting of the media for communication.

Many public and private organizations in Britain have collections of sound recordings containing valuable material and many museum curators are becoming aware of the potential for such material to enliven their displays. But the fact remains that too few people know about the existence of recorded sound collections or have access to them. As a result, in this country, a valuable cultural resource is going to waste. The National Sound Archive (formerly The British Institute of Recorded Sound, and now a department of the British Library) is taking action to prevent such waste by bringing to public attention the value, potential, and availability of recorded sound.

One way of achieving this is through the production of a National Directory of Recorded Sound Collections. A very large number of museums. libraries, clubs and societies, hold collections of sound recordings on an equally large number of subjects. We are interested in hearing about the existence of these holdings, of all sizes and durations, whether on tape or on disc, in all subject areas (e.g. oral history, wildlife sounds, industro-mechanical sound, folklore, dialect, and so on.) Clearly we are more interested in original material, rather than that which is available commercially. But if you, or your organization, possess any recorded sound material, or you know where such material is located, (even if you don't regard it as a 'collection') please let us have details as soon as possible. If more people know about your sound collection - more people will know about the rest of your activities. Please send your information to Jeremy Silver, Research Officer, The National Sound Archive, 29 Exhibition Road, London, SW7 2AS.



WANTS, EXCHANGES, LOST & FOUND

Wardian Cases: a request for information

A recent enquiry about the precise form and appearance of these special glazed boxes for the cultivation of ferns prompts a plea for information. With the limited literature available on the subject here, evidently the Victorian fern craze developed a complex craft of cultivation techniques, one of the foremost of which was the development of these mini-greenhouses for ornamental as well as transport purposes. Most were probably quite straightforward structures of wood and glass, the glazed panels being partly removable. However, it appears that some of the decorative type at least were extremely ornamental, with metal glazing bars and finials etc.

Our enquirer is anxious to trace original drawings of these, as well as examples of the cases themselves, particularly the more ornamental ones designed for drawing rooms and window decorations. So far, he has only seen the rather prosaic ones which are retained by Kew, and which were used by them until the 1960's for the carriage of specimens from abroad. Any information would be gratefully received.

Trevor J. James, Keeper of Natural History
North Herts Museums Service, Old Fire Station, High Street,
Baldock Herts., SG7 6AR. (Baldock 894352)

COL. KERSHAW LEPIDOPTERA COLLECTION

I have recently been in touch with the daughter of the late Colonel S. H. Kershaw, Mrs. J. Wheeler, who lives in Brighton. Col. Kershaw apparently had an extensive and well set collection of British butterflies (and moths?) housed in top-quality cabinets. This collection was apparently given to a Mr. Sidney Humphrey of Pear Tree House, Roade, Northamptonshire. Does anyone know where this collection is now because Mrs. Wheeler has found the diaries associated with it which are now in my possession and should be re-united with the collection.

Yours sincerely,

Gerald Legg
Keeper of Biology.

Booth Museum
Brighton

GREY WAGTAIL SPECIMEN WANTED

Grey Wagtail specimen wanted, preferably a frozen corpse, for new displays at Sheffield City Museum. Contact Steve Garland.

COLEOPTERA COLLECTORS

Does anyone have any material collected by the following people.
E.C.Bedwell (there are some of his specimens in the Kidson Taylor collection at Manchester)
J.T.Houghton
Stephen Pegler
W.E.Ryles
Rev.T.C.B.Chamberlain
All are mentioned in Carr's Invertebrate Fauna of Nottinghamshire (1916).
Details are required by our local Coleoptera recorder.
Contact Steve Garland, Sheffield Museum

Notes for contributors....

I am very pleased with the quality of copy which I have received in recent years. These comments are supposed to be constructive, not criticisms, and may help to save time in producing the Newsletter (inherent laziness).

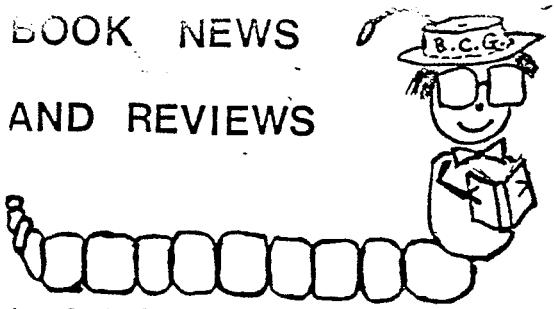
Firstly, I can get material typed but, due to our typists' normal duties, a large tome sent handwritten at the last moment may be impossible to include until the following issue. Also a typed copy, even if untidy and heavily corrected is, Iam assured, far easier to type from than a handwritten one.

Secondly, a large proportion of the contributions are now produced on word processors using dot-matrix printers. These are usually very error-free because of the ease of editing them at your end. However I have had a few problems when the print is very pale. I have tried enhancing the tone on our photo-copier, but the enhanced white around each dot can render it almost illegible. In such cases print it all in heavier type if you have that facility.

Finally, with reference to word-processors again, if the lines are too long, or if the text is not in A4 page sized blocks then retyping may be necessary. If a one inch margin is left around the whole page there will be no problems. If your article is typed on a word-processor, why not store it on disc and let me know that when you send it. Then, if major alterations are needed, it can probably be performed at your end faster than here.

SG.

BOOK NEWS AND REVIEWS



Museum History Newsletter No 1. July 1984
A six-page newsletter containing a useful list of information sources for museums in Britain during the First World War. There are also notes on historical aspects of museums such as Bolton and Norwich. Copies are available from Gail Durbin, The HBMC Education Service, 15 Great Marlborough Street, LONDON W1V 1AF.

Also available from Gail is a Bibliography on provincial museum history drawn up by members of the seminar on the history of provincial museums held earlier this year. Price £1.

We have received copies of newsletters fron Shropshire Biological Records Centre (Ludlow Museum) and Dorset Environmental Records Centre.

The spring 1984 Shropshire newsletter contains interesting details of activities in the county which include studies of Barn Owls, amphibians, butterflies, moths, hoverflies and insectivorous plants.

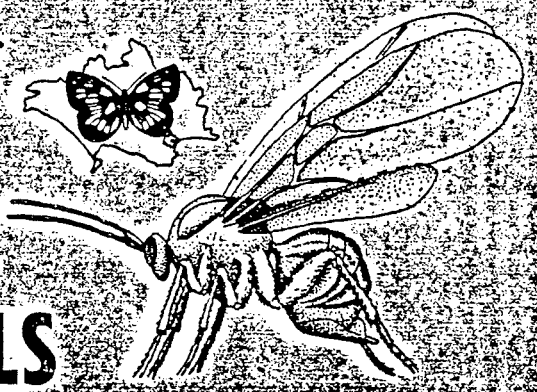
The Dorset Newsletter number 17 (April 1984) gives details of numerous ambitious projects in their county including a project to map ancient woodlands using 25 indicator, flowering plant species. There is also a project to study oak leaf galls. Both schemes are supported by excellent information sheets, including a simple, illustrated key to the galls.

Several publications, such as the forthcoming "Butterflies of Dorset" are mentioned including one very practical one; a gazeteer of Dorset place names. This contains all place names appearing on 2½" maps of the county, a very important basic tool for any local records centre.

DORSET ENVIRONMENTAL RECORDS CENTRE

(incorporating Dorset Biological Records Centre)

c/o Dorset County Museum
High West Street, Dorchester
Tel. Dorchester (0305) 62735



OAK LEAF GALLS

INTRODUCTION

Plant galls are so numerous and widespread that most people will be familiar with examples of them. Although there are many different forms of gall, all are the result of a parasitic attack and represent a growth reaction of the host plant. Galls can be caused by a variety of organisms, including bacteria, fungi and insects, and affect many plants. In all cases the tissue of the gall is derived wholly from the host-plant and is linked with the reproduction of the parasite.

Some of the most well-known galls are those found on Oaks *(Quercus)* and caused by a group of insects known as gall-wasps (Superfamily: Cynipoidae). The galls can take a variety of forms and occur on many parts of the tree. However, the location and appearance of any particular gall is always characteristic of a species, and can therefore be used to identify the wasp which has initiated the gall development.

Cynipid wasps have a complex life-cycle, involving two different generations (asexual and sexual) within a single year. Female wasps emerge in the early spring or summer and lay unfertilized eggs on suitable parts of the host-plant. The eggs and their associated galls develop until the autumn, when the second generation males and females emerge. These then mate and fertilized eggs are

Below is a cover of a new series of booklets produced by Stoke-on-Trent City Museum and Art Gallery.

Prices not available in time for this issue, but contact Geoff Halfpenny for details.

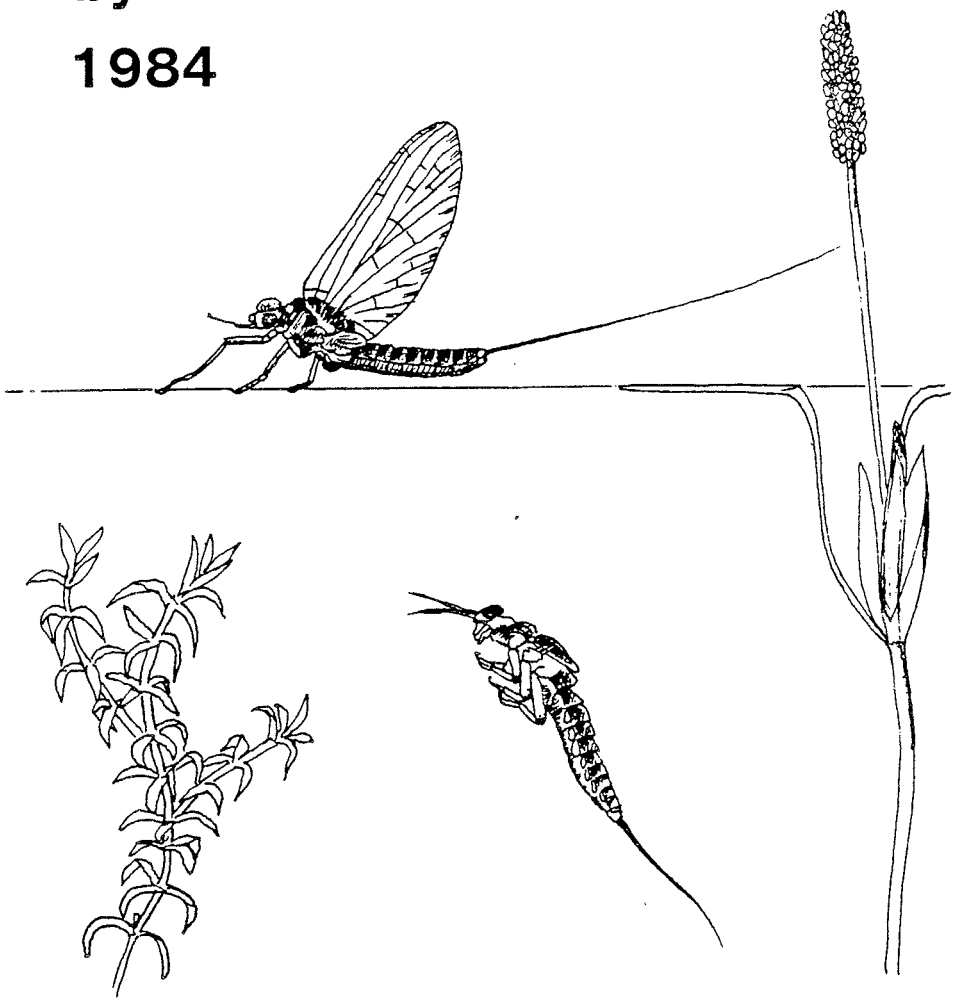
Other titles are listed on the following page...

THE WILDLIFE OF STOKE-ON-TRENT

2. FRESHWATER LIFE

by N. Bowles & C. A. Sutton

1984



City Museum and Art Gallery, Stoke-on-Trent

THE WILDLIFE OF STOKE-ON-TRENT

1. Introduction: URBAN WILDLIFE

by The Environmental Survey Team 1984

City Museum and Art Gallery, Stoke-on-Trent

Curator

Members may like to know that the Journal Curator, published by the American Museum of Natural History, can be paid for by Mastercard or Visa, thus saving the cost of an overseas cheque.

The current subscription rates are:-

1 year	15.00	dollars
2 years	26.00	dollars
3 years	35.00	dollars
+	3.00	dollars per year for postage outside the USA

Subscriptions should be sent to:-

Curator Subscriptions
American Museum of Natural History
Central Park West at 79th Street
New York, NY 10024
U.S.A.

If paying by credit card, include the full account number, the type of card, the expiration date of the card and your signature.

Natural History Option Learning Goals and Bibliography

An updated version of the above is now available from the Department of Museum Studies, 105 Princess Road East, Leicester, LE1 7LG.
Price: £1.60 (plus p and p 25p)

Centres for Environmental Records

There are still a few copies left of the Report on the Conference on Environmental Records held in Leicester in 1973. Copies are available from the University of Leicester, Department of Adult Education, University Road, Leicester LE1 7RH.
Price: 75p (including p and p)

BOOK REVIEW

British and Irish Herbaria. An index to the location of herbaria of British and Irish vascular plants.
by D.H. Kent and D.E. Allen.
120 x 180mm, 333pp. London (Botanical Society of the British Isles): 1984.
£12. ISBN 0 901158 05 4.

This book is a new and much enlarged edition of D.H. Kent's earlier work, British Herbaria, published by the Botanical Society of the British Isles in 1958. It consists of eight chapters of which the main section (chapter 3 of 204 pages) is devoted to an index of collectors whose herbaria of British and Irish vascular plants are contained in British and Irish institutions. Some references are also made to overseas institutions. The other chapters include a list of the abbreviations of the names of institutions to which reference is made in the text, a list of privately owned herbaria, a classified index to the locations of collections with strong representation of local floras, a classified index to the location of collections of critical groups, genera and species, a list of universities, museums and other institutions which may possess herbaria and a bibliography.

To members of the B.C.G. it will prove an invaluable reference book. It is however, disappointing that the authors do not refer to the work of FENSCORE and it is to be hoped that the information contained in the work will be incorporated into the data base at the Manchester Museum. In view of the more extensive work B.C.G. members are carrying out in assembling data on collectors and collections the publication of British and Irish Herbaria serves as a timely reminder of what can be done in a remarkably short time by dedicated people.

The main section on collectors is particularly good with a wealth of associated detail. The conflict between botanist and museum curators concerning the use of abbreviations for institutions remains with the authors following Index Herbariorum. They make no reference to the Museum Documentation Association. Chapters giving indexes of collections with strong representation of local floras and critical groups are less satisfactory largely because the data is not readily available. When modern technology is more widely used in museums and herbaria information of this kind will be much more accessible.

In general, this is an excellent book and both authors and publishers are to be congratulated on publishing it.

E.F. Greenwood.

Please support this section.
Send details concerning new acquisitions, exhibitions, staff appointments or any other newsworthy item to the editor for inclusion in the next Newsletter.

MUSEUM NEWS

Borough of Brighton
The Booth Museum of Natural History
Dyke Road, Brighton

On 30th April Charles Steel, Principal Keeper of Natural Sciences left the Booth Museum to take up the appointment of Principal Keeper Support Services at Portsmouth City Museum and Art Gallery. He has since been replaced by Dr. Philip Armitage who was Head of the Environmental Archaeology Section, Dept. of Urban Archaeology in the Museumof London.

During the past year a number of notable insect collections have been aquired in addition to our steady flow of aquisitions. The sale of the National Butterfly Museum at Bramber, W. Sussex provided an, albeit expensive, opportunity to purchase some useful specimens which have gone towards filling gaps in the collection and boosting certain genera. A total of 13 lots were purchased containing a little over 400 specimens, at a cost of £1100. Funds were provided by a Science Museum Grant-in-Aid, money from Friends of the Museum and from a film company who were using museum facilities as part of film set. Further specimens were obtained from Dr. Arthur Allyn who purchased a very large part of the National Butterfly Museum collection. We exchanged a number of butterflies with him on completion of the auction.

A further collectionwas obtained via the BM(NH) made by M. Pantling in Africa.

Limited sales of the successful publication of Halls Monograph on the Nymphalidae (see October Newsletter) continue. We also kept sales of the Sussex Plant Atlas (£7.95)produced by the Museum, and our other major publication: A History of the Butterflies and Moths of Sussex (£9.95). Both publications are extremely useful and contain a wealth of data. The latter book also contains both monochrome photographs and 90 moths and butterflies illustrated in full colour. Preparations are in hand for the production of a ring-bound Sussex Lichen Flora.

A new Geology Gallery will be opening shortly. By the summer of 1985 a new temporary display on dragonflies and conservation, with a proposed title of "Tigers of the Skies", will be ready. This is being sponsored by Ilford Ltd. and will consist of 20 or more screens of colour photos, many showing hitherto unknown aspects of dragonfly biology. Full details later in this column.

Recent acquisitions at Bolton Museum

Notes on collections acquired fairly recently may be of interest to others. If other institutions were to follow suit it will provide an immediate updating of the FENSCORE database via the pages of the Newsletter. (Although the details still have to be forwarded through CRU's to Manchester in the usual way in order to be computerised).

Plants

Fox, Brian W. (Professor)

A small flowering plant herbarium of 700 sheets collected between 1948-1978 mainly from Lancashire, Wiltshire, Northumberland & Durham, Bute and Outer Hebrides. It includes over 100 aliens from local Lancashire tip sites collected in collaboration with Rev. C. E. Shaw, Roy Lancaster, Charles Howe and J. E. Louseley. Brian Fox has donated them to his native town but retains a comprehensive collection of lichens on which he currently works. (Acc. No. 85.1985).

Flora of the Chorley Area

This is a long term project and the main collaborators are depositing voucher material in the Bolton Museum herbarium. Chorley is an adjacent district, just outside the current Greater Manchester area.

Insects

Tutt, James William (1858-1911)

One store box containing two series, of the Muslin Moth and the Map-winged Swift, about 150 specimens in all. These include a number of other collectors and although they do not include a startling range of varieties it is nice to have some materail from this famous entomologist. (Acc. No. 56.1984).

Edwards, W. F.

Edwards lived at Baycliffe, nr. Ulverston, Cumbria. When he died (c.1960), Mr. John Heath got the cabinet from his widow for use by the Institute of Terrestrial Ecology (J.H. was then employed at the Merlewood Research Station). When John Heath moved to the Biological Records Centre at Monkswood Experimental Station the collection went with him. I used specimens from the collection to make genitalia preparations which were used to illustrate the Critical Species guides published in the Entomologists' Gazette (e.g. Vol. 20 (1959), pp.263-269). This was when I was temporarily employed there while still a student, during the summer vacation of 1968.

Meanwhile my father obtained from his widow several store boxes of moths, a 10-drawer cabinet of foreign Lepidoptera (plus a few insects of other orders), a small collection of bryophytes and several books. The majority of these are still in the familial home in Ulverston apart from the bryophytes which were obtained by Merseyside County Museums in 1970 and the British non-lepidopterous insects which I have accessioned into Bolton Museum.

It is therefore a fortuitous coincidence that on John Heath's retirement he negotiated for the main collection to be transferred to a museum in the north west of England and Bolton was suggested. Of great additional interest are two manuscript catalogues of Edwards' which give a key to the numbered system of cross reference. Included in one of the books is a catalogue of a collection of birds' eggs (although where the specimens are now I have no idea, not recalling any references to birds' eggs at any time) and a list of the aforementioned bryophytes.

Edwards was Manager of the Passenger Division of the old LMS railway. A number of specimens are from Crumpsall, Manchester; the majority are from north Lancashire with the balance from a scattering of localities throughout the British Isles.

The 18-drawer cabinet now in Bolton Museum (Acc. No. 235.1981) was made by W. Downing of Whip's Cross, Walthamstow and contains approximately 3000 specimens of butterflies and larger moths. Most of the drawers have past evidence of a slight Museum Beetle infestation but none of the specimens appear damaged and most have good data.

Coleoptera

A small collection of beetles from pitfall traps were donated by an undergraduate student after using the facilities of the museum to complete her third-year project. These are from a transect of a field in Bradshaw, Bolton.

Geology

Kerr, James (Dr.)

A small collection of fossil plants was acquired from the family's estate (after auction). These are mainly from the Rossendale area. Bury Museum and Art Gallery has a collection of minerals of his but are no longer pursuing a policy of acquiring natural history collections. (Acc. No. 58. 1984).

E. G. Hancock.

Sheffield City Museum - News

S. P. Garland

T. D. Fearnehough butterfly collection.

In 1983 we were bequeathed the collections and library of Mr. T. D. Fearnehough following his sad death.

He lived and worked in Sheffield, where he made extensive studies of the local lepidoptera. Following his retirement in 1961 he moved to the Isle of Wight where he continued his interest. The collection is housed in two fine ten-drawer cabinets and contains a large number of beautifully set butterflies with neat, concise data. Many aberrations and varieties are included and several have been figured in national journals. The only moths are 2,650 specimens of 174 species of Geometridae preserved in an unorthodox fashion. The wings only are mounted under squares of clear, adhesive plastic in 'stamp album' style books. Most carry full data and all are in excellent condition.

Specimens in both collections are mostly from the Isle of Wight and Sheffield areas. Fearnehough's diary contains numerous records from the same areas from 1948 to 1982.

His library contains most of the standard texts on butterflies and their abberations and includes a separate from the Entomologists' Record and Journal of Variation (1972), Volume 84 entitled "The Butterflies of the Isle of Wight" by T. D. Fearnehough. It is interleaved and contains a few annotations.

Another notebook contains a list of references to species mentioned in the diary of Dr. Blair from 1945 to 1952 (stated to be held in Red House Museum, Christchurch, Hants.) and in the diary of J. Wright from 1953 to 1965. The

notes were written by J. Wright but the meanings of the tables of species and numbered references are not clear. A few letters between Wright and Blair, Wright and A. J. Wightman, Wright and F. J. Stone and Wright and (J. H. Vine Hall?) of Kirkby Lonsdale are loose in this notebook.

Finally, the collection contains two volumes of superb watercolour paintings of world Papilio species. This is by no means a comprehensive study, but the detail of the pictures shows that they must have been drawn from actual specimens.

And finally..

The following are two quotations lifted from the new publication "Nature conservation in Great Britain" (N.C.C. 1984)..

"Under the RSNC's umbrella, the Trusts retain local autonomy and concentration of effort, through both site safeguard and their educational, advisory and information work. Their members have played a large part in the identification of prospective SSSIs and reserves, and in other surveys and recording schemes which link with others such as enquiries by the British Trust for Ornithology and the Biological Records Centre's mapping schemes... .....Trusts have increasingly employed conservation officers and wardens and have become much involved in liaison with local planning authorities and in dealing with public inquiries and the provision of advice to various parties."

(p.24 section5.4.2)

The above appears under the chapter titled "Growth of the non-governmental organisations, 1945-1984"

The following piece appears under the chapter titled "Education, the media and recreation."

"The museums, including the British Museum (Natural History), have developed conservation and ecological exhibits and have an important role in stimulating interest in natural history, especially amongst the young. Some provincial museums and universities have developed local records centres supplementing the national collection of data in the Biological Records Centre of ITE. Their collections also continue to be an important source of reference and data supporting survey and other research."

(p.39 section 9.2)

Comments please for the next issue.

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The aims of the Biology Curators' Group are:-

i) to facilitate the exchange of information between individuals concerned with the management of biological collections and records, their research, conservation and interpretation.

ii) to present the view of curators of biological collections.

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