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The camera is connected to two televisions, one positioned to allow the user to see the picture from next to the camera; the other pointing away to be used with groups to show small objects to groups. Tiny objects such as insects can now be demonstrated to school groups, opening up a whole new area of the collections for potential educational use!

The Centre also has a touch-screen computer with information about our local wildlife. It has photographs of local sites, fauna and flora. You can even hear the sound of a fox or the wonderful call of the red grouse! This was produced by a company called Novus. We kept costs down by sourcing most of the photographs from staff and local naturalists. Not only is the computer popular, but the sounds of owls hooting and badgers grunting is guaranteed to attract visitors to the gallery.

Finally there is a continuous supply of scrap paper, worksheets and crayons for drawing and writing. This is the most popular pastime with children. A drawer of exhibits can provide hours of fun! Who needs computers???

Local Information Centre

The Wildlife Study Centre provides one temporary display case and a large notice-board, also the Main Gallery contains an information board. These areas are used to publicise various aspects of the museum's work, work of local voluntary groups and general environmental topics. Here you can find details of every forthcoming natural history meeting in the area, contacts for all relevant local societies and leaflets on all aspects of the environment from pollution to country parks to tree preservation orders! This is also the place that we publicise wildlife surveys for our Biological Records Centre.

The Main Gallery Displays.

The main gallery display is a mixture of detailed dioramas and smaller topical displays relating to environmental issues. We have attempted to maintain the highest quality of presentation throughout (finances permitting). There has been an enormous input from natural history staff and the museum's display technician.

The main displays are built over the carcasses of old brass cases. These were very shallow and awkward to access, due to heavy doors. They also had internal fluorescent lighting that required removal of exhibits when lamps required servicing. The new cases are all fibre-optic lit with eight 150 Watt units providing light for all the cases. The power units are sited on top of the cases, so servicing is easy. Light levels are maintained at between 50 to 100 lux in most areas and the fibre-optic light is cold with minimal Ultra Violet content.

The new cases were built by our display technician, Gary Webster, and provide much more display space, changing the area from one with cases lining the walls to a display area with bays. Taxidermy Technician Geoff Yates built all of the major dioramas and several smaller displays. Keepers Patricia Francis and Kathryn Berry built most of the others and researched and wrote most of the labels. Reading ages were carefully checked, and topics carefully linked with the ever-present, ever-changing National Curriculum where possible.

Labelling dioramas has always been a problem. Do we place numbers or names by everything and kill the whole effect? Maybe we should use outline drawings to match up the specimens. We decided against this because we felt that people did not identify the specimens, merely recognise the willow warbler because it is the one on the left with its wings open, as in the outline. We were fortunate to be able to work with Blackpool and The Fylde College who have a Scientific Illustration Course. Students performed work as part of their course, some on placement in the museum. The styles of the labels vary, but many are of exceptional quality. The originals are carefully stored; the displays using colour photocopies. Interestingly, the quality of colour photocopies is nowadays very good and they appear to be extremely resistant to fading. They can be produced directly from colour transparencies as well as from artwork. Our A2 copies cost around £18 each. We hope that people

now look at the colours and markings of the plants and animals to identify the exhibits; good luck to them with the warblers!

We attempted to use the best quality exhibits wherever possible. Many new displays in some quite famous large museums have been let down by (frankly) tatty animal specimens. The insect displays (wall mounted under large perspex covers) contain exhibits in mostly lifelike poses. Why is it that invertebrate displays are so often of set specimens straight out of the collection drawer. Would you use a study skin of a vole in a diorama? Plants are always a problem. The gallery uses a variety of techniques from detailed wax models to photographs, air-dried and freeze-dried specimens.

Educational Use By Schools

As part of the project we developed an Education Pack. This was designed, researched and put together by Econsult, the trading arm of our local Lancashire Wildlife Trust, with copious input from Kathryn and Patricia. Chris Whitehead at the LWT was largely responsible for the content (as he was for the design of the original food-web game adapted as a floor-mounted version in the gallery). It is an impressive educational package that, due to sponsorship from Marks & Spencer and the Friends of Bolton Museum & Art Gallery we have been able to distribute free to all Bolton Schools. (If you would like a pack please send a cheque for £12.50 p+p incl. payable to 'Bolton Metro') The pack has fifty high quality worksheets printed onto card. Teachers can photocopy them for use on visits or in school before or after a visit. There is also a twenty page teachers' guide included with background information and booking details. The recent appointment of a part-time Natural History Education post has been especially welcome to exploit this fully.

A small selection of sheets are provided free in dispensers for the public to use. This is a popular feature of our service in Bolton. Last year the Museum distributed over 300,000 sheets on all subjects to the public and to visiting school groups. Copies are produced on a very large council copier and the cost is around £3500 per year! (We received over 150,000 visitors last year.)

The gallery has been designed with children in mind. Around the front of all the cases is a small step. This is narrow enough to be no problem to adults, but are high enough for children to see into the higher cases, thus eliminating the eternal problem. (The majority of museum displays are too high for kids). These same steps provide resting surfaces for worksheets on clipboards. They also provide impromptu seats for exhausted parents who have given-up trying to get their offspring to leave the Museum!!

The Wildlife Study Centre has been designed to hold half a school class. A number of additional exhibits and some other equipment are available from locked cupboards for use by teaching staff.

Does It All Work ?

In a word, YES! Natural History Staff who visit the gallery to top up leaflets, worksheets, crayons and paper have been accosted on a number of occasions!! Members of the public can't resist thanking us! At autumn half-term the Wildlife Study Centre was so full that people were standing around waiting to get in!! A small donations box (a purely voluntary and very low-key afterthought) raises about £7 a week on average. Feedback from schools has only just begun, but seems good.

Oh!! I forgot to mention the ten foot house sparrow!!

B. P. BEIRNE MICROSCOPE SLIDES OF ICHNEUMONIDAE AT THE NATURAL HISTORY MUSEUM, LONDON

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Introduction

In connection with a project to study the phylogenetic relationships of the subfamilies and certain selected genera of

ichneumonids, the microscope slides of Bryan P. Beirne at the Natural History Museum, London (formerly the British Museum (Natural History) and referred to here as BMNH) were examined. In order to interpret the slides more fully and to increase their usefulness to future workers, efforts were made to collate information relevant to the slides, to locate the pinned specimens from which the slides were prepared and to verify the currently valid species names. A brief assessment of the condition of the slides and some recommendations for their curation are made.

Acquisition of the slides

The precise date of acquisition of the slides by the museum is unclear since there is no mention in the accession registers of the Department of Entomology, although they were probably transferred shortly after Beirne finished his work on diplazontines in 1941. The BMNH was a natural choice of repository, since many of the slides were made from pinned specimens in its collection. A. W. Stelfox, from whose pinned specimens a number of the slides were made, did not wish to retain those slides and had no objection to them being deposited at the BMNH (B. P. Beirne, pers. com.), although he retained the pinned specimens in his own collection. Some of the slides (diplazontine abdominal sclerites) have been incorporated into the main Hymenoptera slide collection at the BMNH, although the slides of skins of larval ichneumonids are still kept separate in three wooden slide boxes.

Historical background

Although he had not attended a formal entomology course as part of his first degree, Beirne took up the study of ichneumonid larval skins at the suggestion of A. M. Gwynn who was then working on African locusts (B. P. Beirne, pers. com.). The result was Beirne's thesis entitled "A consideration of the cephalic structures and spiracle of the final instar larvae of the Ichneumonidae" for which he was awarded a Ph.D. in 1940 (D. Hamill, Trinity College Library, Dublin, pers. com.), the beginning of a long career in entomological research including pest management and agricultural entomology (O'Riordan, 1985). At that time, Beirne was an assistant to Professor Bront. Gatenby in the Zoology Department of Trinity College. Professor Gatenby's main interest was in cytology (Grainger, 1960) and he showed little interest in Beirne's thesis although A. W. Stelfox of the National Museum, Dublin was more helpful. As the United Kingdom did not recognise the Irish Republic at the time, Beirne qualified as a colonial and was able to visit the BMNH with finance from an Overseas Fellowship of the Royal Commission for 1851. He made a number of visits for several weeks at a time, firstly to study larvae and then other aspects of ichneumonid taxonomy, including the diplazontine ichneumonids (B. P. Beirne, pers. com.). The culmination of this work was two major publications on the larval skins of ichneumonids (Beirne, 1941a) and the abdominal sclerites of diplazontines (Beirne, 1941b). J. F. Perkins (then at the BMNH) was sufficiently interested in Beirne's results to contribute a revised classification of Ichneumonidae to the paper on larval ichneumonids. This is significant as the only time that Perkins' classification was published.

The Microscope slides

The Beirne microscope slides may conveniently be divided into two groups, corresponding to the two major papers (it is not certain how many slides were originally prepared, the numbers given below are those currently in the BMNH): a) 231 slides of the final instar larval skins of Ichneumonidae. These are of importance as many were figured by Beirne (1941a), consulted by J. R. T. Short for a number of projects (see Short, 1978 for references) and also by D. B. Wahl (for example Wahl, 1986, 1988 & 1993). In addition, one of Beirne's slides bears the larval skin of a paratype of *Adelognathus granulatus* Perkins, 1943.

b) 48 slides of the genital and postgenital abdominal sclerites of diplazontine ichneumonids. These are of importance as they were figured by Beirne (1941b). Although Beirne only refers to the

sclerites of the male in the title of this paper there are also some slides of sclerites of females.

The two groups of slides are dealt with in more detail below:

1. Slides of the final larval instar skins of Ichneumonidae.

For the preparation of his slides, Beirne extracted larval skins from the cocoons of reared ichneumonids in the collections of A. W. Stelfox, of which most is now in Washington and Dublin (Krombein, 1967; Beirne, 1985; O'Riordan & O'Connor, 1988), the BMNH, and A. M. Gwynn. The current location of Gwynn's collection is not known: It may be in a Scottish museum since Gwynn went to practice medicine in Aberdeen (B. P. Beirne, pers. com.), although it is not in the National Museum of Scotland, Edinburgh (M. R. Shaw, pers. com.) or the Zoology Museum of Aberdeen University (R. Ralph, pers. com.). After macerating the skins in potassium hydroxide solution and washing them in acetic acid, they were mounted in Faur's or Berlese's medium. Most were not stained although a few were stained with an unnamed orange stain. A list of slides and specimens was made. BMNH specimens from which larval skins were extracted had a small label with an ink, handwritten, code number in the form "BPB {number}" and the slides were given a corresponding code number in the form "BM {number}". The current state of cross referencing between slides and pinned specimens is poor because of the loss of the lists, the inadequate labelling and because of the separation of some of the pinned specimens from the slides.

The slides suffered some deterioration after being transferred to the BMNH in particular drying which has allowed the entry of air bubbles and slight oxidative discoloration of the mountant, a result of the slides not being ringed. Aqueous gum-chloral mounting media are no longer regarded as suitable for permanent mounts (Upton, 1993) and consequently current workers favour more stable mountants (Wahl, 1984; Noyes & Polaszek, 1988; Wahl, 1989). The damage may have been hastened circa 1955 due to storage in a cupboard through which a heating pipe passed (B. P. Beirne, pers. com.). There are also a small number with cracked coverslips. A few of the preparations were remounted in Canada balsam by J. R. T. Short in 1977. Some of the slides seem to be lost since there are specimens in the collection of the BMNH with labels which do not correspond with any of the slides.

A total of 59 pinned specimens from which larval skins were extracted were located in the main collection of the BMNH, from the names given on Beirne's slides and in his papers (current equivalents of the names used by Beirne were found by consulting the "Taxa" computer database (Yu, 1993)). Such specimens were often obvious from the neat way in which the ichneumonid cocoon had been slit in order to extract the exuvia. It is probable that more specimens exist elsewhere in the collection if they were redetermined, although owing to the small size of Beirne's labels they will be difficult to detect.

Since the original list of slides and specimens was lost (B. P. Beirne, pers. com.) new lists were drawn up summarising data on a) slides of larval skins and b) pinned specimens, located in the BMNH collection, from which larval skins were taken.

2. Slides of the genital and postgenital abdominal sclerites of Diplazontinae.

For the preparation of his slides of diplazontine tergites, Beirne followed a similar procedure to that used for larval skins. The material used came mostly from the BMNH collection, but some may possibly have been from the collection of A. W. Stelfox, according to the introduction to Beirne's (1941b) paper, although the precise origin was not marked on the slides. BMNH specimens from which sclerites were removed had a label with the following data attached: "Genitalia on B{number} / B.P.Beirne, 1940" and the slides were given a corresponding numbered label in the form "Genitalia B{number} / {species name} / B.P.Beirne, 1940". A list of slides and specimens was made although this is now lost. The current state of cross referencing between slides and pinned specimens is poor because of the loss of the lists and the inadequate labelling.

The slides were mostly in good condition, although there were a few where the mountant had dried out and/or the coverslip was broken. Some of the slides seem to be lost since the code numbers indicate at least 51 slides, also there are some specimens in the collection labelled by Beirne for which no corresponding slides exist.

A total of 29 pinned specimens from which sclerites were removed were found in the main collection of the BMNH. It is possible that some specimens were overlooked since they may have been redetermined and placed elsewhere in the collection.

Since the original list of slides and specimens was lost (B. P. Beirne, pers. com.) new lists were drawn up summarising the data on a) the slides of sclerites and b) specimens located in the BMNH collection from which sclerites were taken.

Curation

The following recommendations have been accepted by BMNH collections management in order to safeguard the slides from further deterioration and to maintain their usefulness:

In the short term:

a) Remount those preparations in immediate danger of deterioration, particularly: i) those where the coverslip is broken and there is the danger that the specimen will flake off and ii) those where the mountant has dried, allowing air to enter under the coverslip and there is the danger of the disruption of the specimen. It is recommended that a more stable, tried and tested medium such as Canada balsam should be used. Care will be taken to retain original slide labels where possible.

b) Where no deterioration is apparent, ensure that each slide is ringed with Canada balsam or Euparal to prevent drying of the mountant and entry of air bubbles.

c) Improve storage of and access to the slides by rehousing in a purpose built slide cabinet with suitable protective covers and divider labels. It would be most useful to future workers if the slides of larval skins were kept together as a body (the slides of diplazontine sclerites would stay together anyway under the present systematic arrangement of the BMNH Hymenoptera slide collections).

In the medium term:

d) Label all slides, with the current valid name of the species concerned.

e) Label pinned specimens (in BMNH collection) prominently.

f) Locate pinned specimens in other repositories (Stelfox and Gwynn material) and ensure they are adequately labelled and cross-referenced with their respective slides.

g) Investigate possibility of transfer of pinned specimens in other repositories to the BMNH so they are not separated from their slides.

h) Copy relevant lists and other appropriate documentation and place them both with the slides and also in the collection archive.

Summary

Information on the Beirne microscope slides at the Natural History Museum, London is summarised, including slides of final instar larval skins and the abdominal sclerites of diplazontine ichneumonids. Many of the original specimens from which the slides were made were located and lists of slides and specimens have been drawn up. Brief notes were made on the conditions of the slides and some recommendations for their curation are made.

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PROCEDURE FOR COLLECTION RELOCATION

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Introduction

These Guidelines arose out of the experience of the North West Collection Research Unit [NWCURU] over the last few years in relocating natural science material between institutions. It is hoped the Guidelines will prove useful to curators involved in arranging the relocation, or rationalisation, of collections, by helping both the disposing and the acquiring institutions to agree on all important aspects of the transfer in advance. The Guidelines should also inform the work of Collection Research Units [CRUs] around the country.

It is important to approach any such relocations in a positive manner, making it clear to all interested parties that the ultimate aim is to improve the curation, documentation and access to the collection.