



<http://www.natsca.org>

NatSCA News

Title: Re-organising the Coleoptera Collection at Leicestershire County Council Service

Author(s): Steve Lane

Source: Lane, S. (2011). Re-organising the Coleoptera Collection at Leicestershire County Council Service. *NatSCA News, Issue 21*, 75 - 88.

URL: <http://www.natsca.org/article/105>

NatSCA supports open access publication as part of its mission is to promote and support natural science collections. NatSCA uses the Creative Commons Attribution License (CCAL) <http://creativecommons.org/licenses/by/2.5/> for all works we publish. Under CCAL authors retain ownership of the copyright for their article, but authors allow anyone to download, reuse, reprint, modify, distribute, and/or copy articles in NatSCA publications, so long as the original authors and source are cited.

Re-organising the Coleoptera Collection at Leicestershire County Council Museums

Steve A. Lane

11 Nuneaton Road, Fillongley, Warwickshire, CV7 8EZ

Email: steve_cov@hotmail.com

Abstract

In 2010, Leicestershire County Council Museums acquired funding to undertake collections management work on their entomological collections. The remit of the resulting project was to incorporate store-box material into the main Coleoptera series. A total of 22,300 specimens were transferred and the collection was re-organised to allow for this expansion. Identification was carried out on the majority of material that was processed. Documentation and accession-labelling were also undertaken. As a result of the project, the collection is more accessible and less vulnerable to pests and to damage.

Keywords: Leicestershire County Council Museums, Coleoptera, Storage, Collection, Identification, Re-organisation, Documentation.

Introduction

The Natural Life collections held by Leicestershire County Council Museums are currently housed at the Collections Resources Centre (CRC) at Barrow-upon Soar, Leicestershire. Here, they are maintained by full-time staff, with assistance from volunteers. The collection contains modest assemblages of British molluscs, mammals and birds, but its strengths are in botany and entomology. The entomology collection is known for its Nationally significant holdings of Lepidoptera (butterflies and moths) and Coleoptera (beetles).

For a considerable time, around half of the entomological collection had been stored in store-boxes rather than cabinets. This situation had resulted from the acquisition of a large number of donations in a relatively short time, when resources were insufficient to process the vast quantity of material involved. Store-boxes are inappropriate for long-term storage of specimens because, as lightweight units, they are vulnerable to vibration which can damage and dislodge specimens. This risk increases when collections are moved.

A much greater threat comes from pest species such as carpet beetle (*Anthrenus verbasci*) which, in its larval form, can penetrate the small gaps in store-boxes to gain access to the interior and reduce the contents to frass and data labels. In order to protect the collection in the long-term, funding was secured in 2009/2010 to transfer the Lepidoptera into secure cabinet units. Work was completed on this group by early 2010.

Funding was acquired for a similar project for Coleoptera and Hymenoptera in the latter half of 2010. This work was undertaken between early September 2010 and early March 2011, by EcoLine staff, Camille Newton and the author. A small amount of work was also carried out on the Hemiptera collection.

This report details the work carried out on the Coleoptera collection.

The Coleoptera Collection

The Coleoptera collection at Leicestershire County Council Museums is one of the largest public collections in the UK. The total number of specimens was estimated in February 2011 to be around 97,200. There is a wealth of associated anecdotal information relating to the collectors and the history of collecting in the region. This has been extensively researched and published by Lott (2009). The information gives Leicestershire's Coleoptera collections a context that is too often lacking in UK Museums.

The collection can be broken down into a number of components, the details of which are as follows:

Main Series (comprising Barrow, Tailby, Taylor, Hunter, Bates et. al.)

Before the project began, the main series was estimated at around 43,300 specimens. This estimate was based on the assumption that each British species was represented on average by 12 specimens. In reality, some of the rarest British species were not present at all whilst the most widely distributed and frequently encountered beetles may have been represented by 40 or more specimens.

The collection is housed in lockable 10-drawer wooden Hills-type cabinets and prior to the project, it occupied 24 of these units. For the most part, specimens were set out in traditional style on cork in paper-lined drawers, the specimens standing over their respective name labels (Fig. 1). The checklist labelling was out-of-date, and appeared to follow the earliest version of Kloet & Hincks checklist of British Insects, published in 1945.

The exception to this layout was for the Carabidae – the Ground Beetles (364 British species), the Gyrinidae through to the Hydrophilidae – the Water Beetles – (some 200 species), the Sphaeritidae and Histeridae (some 53 species) and the Cantharoidea – the Soldier Beetles and allies (50 British species). These groups had all been transferred into plastazote-lined unit trays with up-to-date name labels. There are around 4,000 beetle species in the British Isles; thus around one sixth of the main series collection had already been transferred into unit trays before the project began.

Much of the material was unreliable in terms of its identification accuracy, with a rate of around 3-5% inaccuracy in species determinations. Thus it was estimated that around 2,000 specimens were likely to be wrongly identified and therefore misplaced in the collection. In addition, there were many gaps in the layout within species. This may have resulted from specimens being removed and not returned to their correct places. This has led to the collection appearing untidy and it also wastes space in the drawers.



Fig. 1. A drawer of main series Silphidae before re-organisation. (Image © Leicestershire County Council Museums)

The main series contains a small number of old specimens of Nationally extinct species. It is regrettable that in most cases, these are without collecting data, but it is thought that they are likely to have originated from the UK. Examples are specimens of the click beetle *Ampedus sanguineus* (Linnaeus, 1758) (Fig. 2), the ground beetle *Lebia scapularis* (Geoffroy in Fourcroy, 1785) and the dung beetle *Brindalus porcicollis* (Illiger, 1803). In most British Museums, these species are represented by spaces in drawers.



Fig. 2. *Ampedus sanguineus* (Linnaeus, 1758) specimens. (Image © Leicestershire County Council Museums)

The collection also contains significant data that has yet to come to the attention of the National Recording schemes. One example is the heathland leaf beetle *Cryptocephalus biguttatus* (Scopoli, 1763), represented by a solitary specimen, probably originating from Parley in Dorset in July 1936, but labelled *Purley, Hampshire* (sic.) (Fig. 3). This record escaped the attention of Mann & Barclay (2009), who detailed the 122 known specimens in UK collections .



Fig. 3. *Cryptocephalus biguttatus* (Scopoli, 1763). (Image © Leicestershire County Council Museums)

Another example is the metallic green Tansy Leaf Beetle *Chrysolina graminis* (Linnaeus, 1758), a UK BAP species which is fast declining in the UK and now known from only a handful of sites. A specimen from Aylestone, Leicester in July 1951 is very significant indeed (Fig. 4). The Museum has around 120 specimens of this leaf beetle, most with full data.

The store-box collections are as follows:

The Hunt Collection (Accession Z.195.1985) (fig. 5)

This large collection, numbering some 19,300 specimens was housed in 43 store-boxes at the start of the project. Around half of the collection had been catalogued by Trevor Forsythe (TGF) and the majority of these specimens bore accession labels.



Fig. 4. *Chrysolina graminis* (Linnaeus, 1758). (Image © Leicestershire County Council)



Fig. 5. A store-box of Hunt Elateridae. (Image © Leicestershire County Council Museums)

However, TGF had not seen or catalogued the Carabidae (1,100 specimens), the Staphylinidae (around 2,800 specimens) or a further 9 store-boxes that were densely packed with a miscellany of unidentified specimens (Fig. 6). Many of these specimens were dirty and mouldy and were mounted on brown-stained card. Some had become dislodged and were lying on top of others with potential to cause damage. None of the specimens had accession numbers.



Fig. 6. A store-box of unidentified miscellaneous Hunt material. (Image © Leicestershire County Council Museums)

It is understood that these 9 boxes were possibly a 'surplus' collection that was at one time intended for distribution to keen amateurs visiting the Museum who wanted voucher specimens for their own reference.

The mould present on Hunt specimens was not active and was thought to have occurred when the store-boxes were stored in a basement that subsequently flooded. The grime and mould present on many specimens creates a potential barrier to identification because it obscures features of the beetles that are critical. The accuracy of identification in this collection was good in some areas and poor to moderate in others. The collection contains a significant number of Red Data Book and Nationally scarce species and is therefore an important data resource.

The Tozer Collection (Accession Z.97.1993) (Fig.7)

This neatly presented collection comprises around 14,000 specimens. Prior to the , which were stored in 31 large store-boxes and glass-topped drawers. With very few exceptions, all specimens had been accession-labelled and catalogued (by TGF). Around 2,500 specimens (the Cantharoidea, the Water Beetles, most Carabidae and some of the Staphylinidae) had already been transferred into the main series before the project began. The condition of Tozer's collection is generally very good and the accuracy of determinations high. It contains a large number of Red Data Book specimens and much local material with full data.



Fig. 7. A store-box of Tozer specimens. (Image © Leicestershire County Council Museums)

The Garner Collection (Accession X.Z5.2010 & X.32.1992)

This collection, housed at the start of the project in three very large store-boxes, and three medium-sized boxes, comprises 1,772 specimens. Most of these were collected in Leicestershire and France. The French material (around 600 specimens) and a small amount of the British material is mounted on composite card mounts with several different species together. The collection was not catalogued or accession-labelled and very few specimens had been identified. It does not hold a great deal of Nationally scarce material, but does have a wealth of locally-collected material with full collecting data.

The collection was found to be in generally good condition, although the pins that Garner used are small and have corroded in most cases. This makes pinning them into any medium rather difficult and somewhat ineffective. It also increases the opportunity for crawling pest species to access the specimens since the cards when pinned into plastazote, lie flat on the bed of the drawer or tray. The small pins, along with the relatively large card mounts, make Garner's specimens instantly recognizable.

The De Montfort University Collection (Accession X Z2. 2004) (Fig. 8)

This collection of 5,707 specimens was housed in 10 glass-topped drawers at the start of the project. The arrangement of specimens was rather disorganised with, for example, specimens of one beetle family occupying sections of several different drawers.

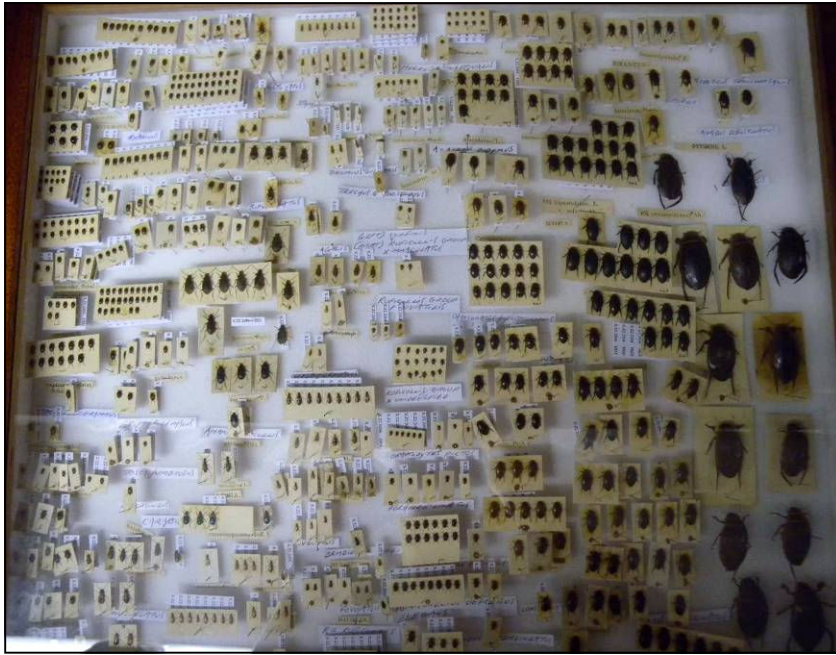


Fig. 8. A DeMontfort drawer containing Carabidae, Dytiscidae and Haliplidae. (Image © Leicestershire County Council Museums)

TGF had accession-labelled, identified and catalogued the entire collection. The overall condition was found to be very good and identification accuracy was found to be moderately high. There is very little if any local material present. Unusually for a collection of this size, there are no weevils. This is normally a popular group, so its absence is surprising and begs the question whether that part of the collection was separated off at some point. Although Nationally Scarce species are present, there is little Red Data Book material relative to the Tozer and Hunt collections.

The Clark Collection (Accession X Z2. 2008) (Fig. 9)

This collection numbers 3,470 neatly presented specimens, representing most of the popular beetle groups and with strength in weevils (Curculionidae). It was stored in 6 large store-boxes prior to the project. Unfortunately, the collection had been attacked by *Anthrenus*, leaving a number of specimens partly or wholly destroyed. Also, in common with the Garner collection, there are a large number of specimens (approximately 900) that are presented as multi-species card mount composites (Fig. 10). TGF had catalogued the entire collection and checked identifications. Identification accuracy was found to be high.

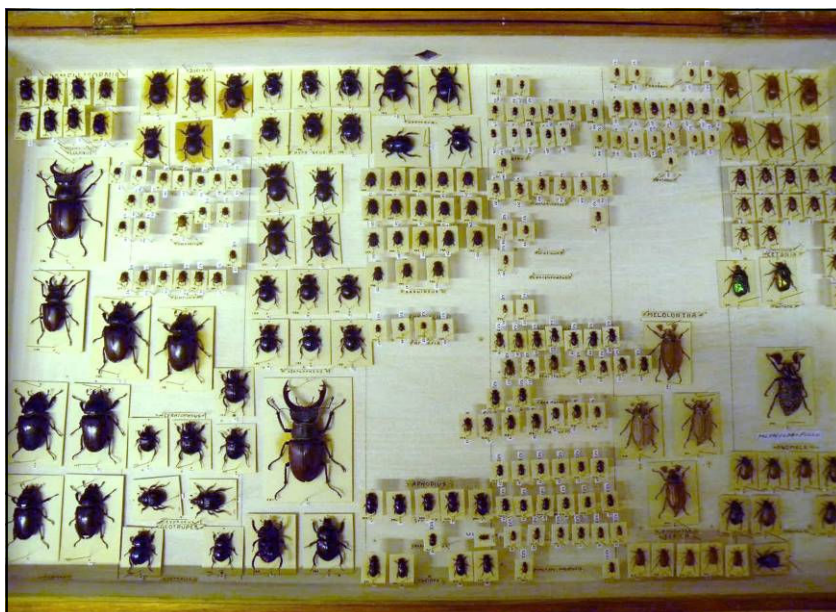


Fig. 9. Clark Scarabaeoidea. (Image © Leicestershire County Council Museums)

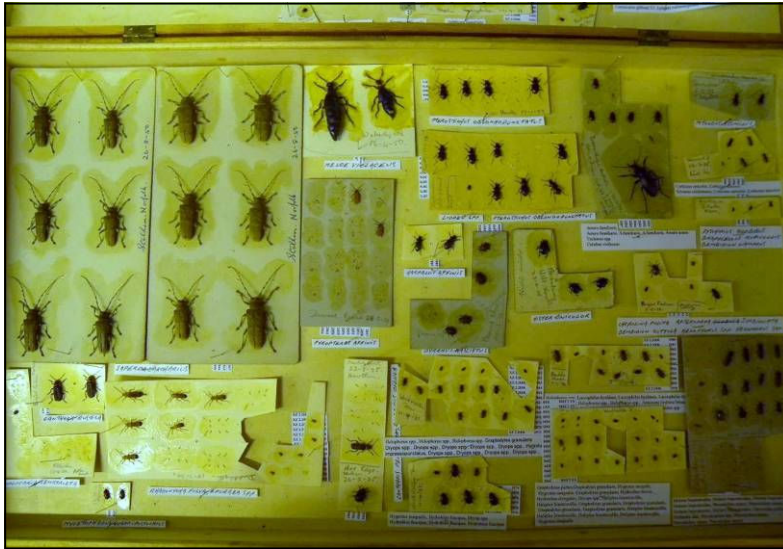


Fig. 10. An example of Clark composite species mounts. (Image © Leicestershire County Council Museums)

The Henderson Collection (Accession Z.90.1983) (Fig. 11)

This moderately large collection contains around 8,000 beetles. It occupies 17 drawers in two metal cabinets and has not been amalgamated into the main series. The reasoning behind this segregation is to preserve the unique presentation of the collection. The specimens are all meticulously set and arranged in regular rows above stylised handwritten name labels (e.g. Fig. 11). Some of the rove beetles and all of Henderson’s ground beetles (Carabidae) and leaf beetles (Chrysomelidae) had been moved into the main series, but it is not clear why this had occurred.



Fig. 11. Detail of a Henderson drawer. (Image © Leicestershire County Council)

Unfortunately, the collection has suffered significant pest damage from moths as evidenced by the remnants of silk and frass on specimens (Fig.12). The collection contains a relatively high proportion of Red Data Book and extinct British species and is a valuable data resource. The author knows of no catalogue for this collection. It is also apparent that a number of specimens are misidentified or misplaced.

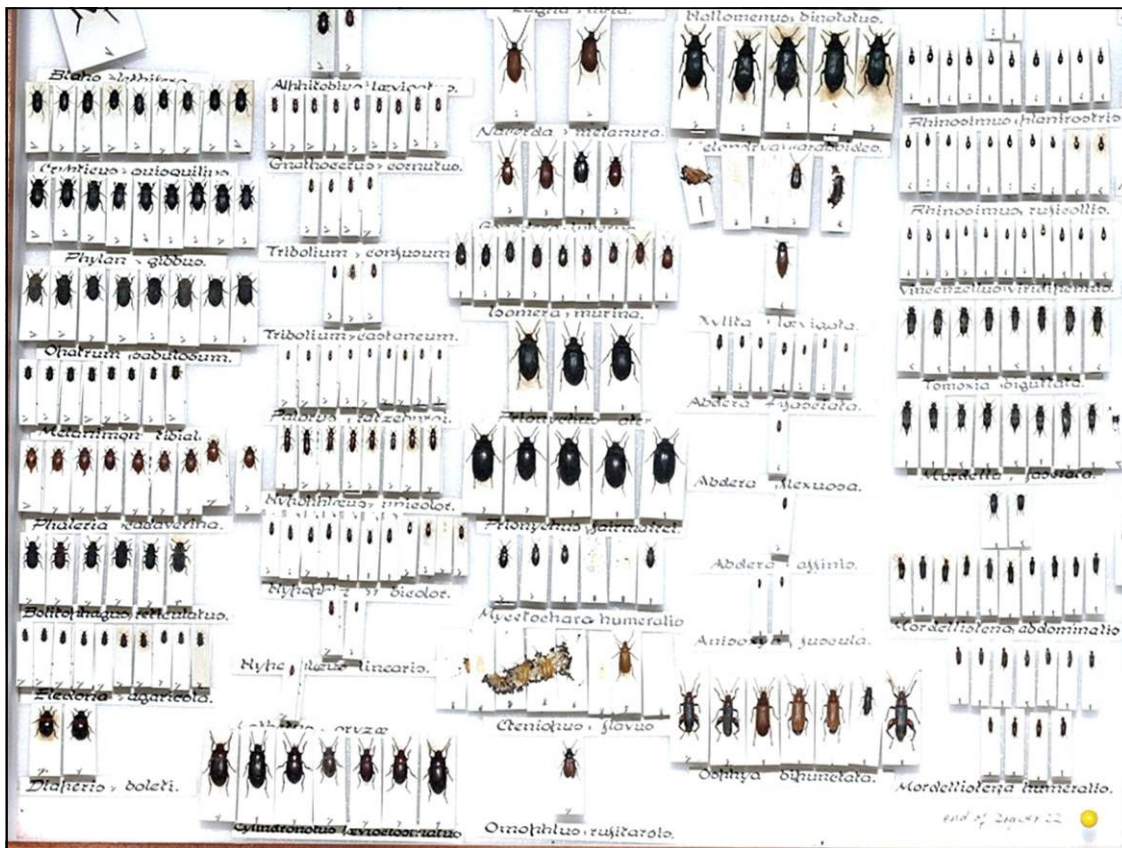


Fig. 12. Henderson Tenebrionidea showing moth damage (bottom left of centre). (Image © Leicestershire County Council Museums)

Smaller Store-box Collections

The Bullock Collection (Accession X.21.2004) containing 521 specimens, was originally housed in four small store-boxes. It was catalogued but not identification-checked, by TGF and neither was it accession-labelled. Identification accuracy was found to be moderate to poor. The condition of the collection was found to be fair to good, with the exception of a number of badly set, pin-staged specimens that have been destroyed. There is little noteworthy material in the collection.

The Evans Collection (Accession X.Z1.2001) contains only 315 specimens, the vast majority of which are Carabidae with full collecting data. It was housed in one large store-box. Approximately a third of the collection had been identified and was labelled with species labels. The entire collection was without accession labels and had not been catalogued. Unfortunately, it had been badly attacked by *Anthrenus* which has resulted in significant damage to many specimens. Like the Garner and Clark collections, there are several examples of multi-species composite card mounts that cannot be directly transferred into the main series.

Additional smaller store-box accumulations were also present, but these are not detailed here.

Methodology

The primary objective of the project was to transfer store-box material into the main series cabinets. In total, just over 100 store-boxes and drawers contained material for transfer amounting to around 40,500 specimens. The apparently simple task of transfer was complicated by a number of factors, some of which came to light after the project had started. They include the following:

- The main series (apart from those groups specifically mentioned earlier) was laid out in traditional style on cork, in paper-lined drawers without adequate space allocated for expansion of each species. This meant that the main series itself had first to be processed by transferring it out of traditional layout into newly-labelled unit trays before the addition of store-box material could commence

- Large species such as longhorn beetles (Cerambycidae), chafers and stag beetles (Scarabaeoidea) and burying beetles (Silphidae) are not appropriate for housing in unit trays because each tray can only accommodate a maximum of perhaps three or four specimens, thus wasting valuable drawer space. These required to be set out in traditional style in plastazote-lined drawers, making sure to leave adequate space for future collection expansion
- Store-box material was not identified to species level in the Hunt miscellany and in the Evans and Garner collections and therefore had first to be identified before it could be positioned in the main series
- Some Garner and Hunt store-box material was so mixed up that it could not be processed without first sorting into taxonomic groups.
- Some of the collections for transfer were not accession-labelled (some Hunt material, Bullock, Evans, Lott and Garner collections), so these required first to be labelled before transfer
- Expansion of the collection meant that the species content of each main series drawer was liable to change and thus the drawer labelling and indeed the cabinet labelling would have to be renewed to reflect this
- In the Garner, Evans and Clark collections, some of the material existed as species-composite card mounts. To put individual species from these card mounts into their respective places in the main series, they would first have to be soaked off the card and then remounted and re-labelled. The project did not make provision for this process

In reality, the project developed a greater number of tasks as follows:

- To sort miscellaneous store-box material into identifiable family groupings
- To identify unidentified store-box material and to label this with det labels
- To add accession labels to all specimens that were without them
- To transfer main series material into unit trays that had first to be labelled up with up-to-date checklist nomenclature
- To re-arrange groups containing larger species into plastazote-lined drawers with traditionally-labelled layout
- To transfer store-box material into the main series
- To re-label drawers and cabinets to reflect the altered content within

Additional non-essential work carried out to enhance access to the collection was:

- To check species identification where the skill of the contractor allowed this to be done quickly. Any identification that would have been too time-consuming was avoided, with instead, notes being written and placed in the main series next to that species group to the effect that critical identification was required at a later date
- To re-label any re-determined store-box specimens with det labels
- To catalogue collections that were first identified and accessioned during the project (Garner, Evans and Hunt surplus material)
- To note down and document any Red Data Book field collection data for very scarce species from the main series and store-boxes

- To put non-RDB and non-Nationally Scarce specimens without data or provenance into a Learning Collection
- To photograph every drawer in the collection both as a record for the contractor and the local authority and for use by the local authority in any future documentation or publicity relating to the collections

Follow up work would include:

- The documentation of all re-determined specimens from the catalogued collections of Clarke, Bullock, Tozer, Hunt and DeMontfort with the intention that the catalogues will be amended with this information at some later date
- The production of a report detailing the work done and recommendations for future collections care
- The publication of papers in journals detailing the work done and raising the profile of Leicestershire County Council Museums's collection

A decision was made to divide the tasks between CRC Barrow and the EcoLine office in Warwickshire. Thus, resources at Barrow would facilitate the transfer of material from store-boxes into the main series and the organisation and identification checking of the main series. The EcoLine office would be the base for undertaking documentation and sorting, identifying and labelling Hunt, Garner, Bullock and Evans material.

Store-boxes were signed out of CRC and back in by exit form procedures. At EcoLine, boxes were stored in a secure, lockable steel cabinet. Once store-boxes were returned to CRC, they were bagged up and placed into deep freeze at – 40C for a minimum of 24 hours as a precaution against pest infestation. They were then allowed to thaw out before being opened to process material.

Collections were tackled on a family-by-family basis, the order of which was determined by the familiarity of the contractor with identification of those species groups. This work method was thought to be more efficient than using only one collection at a time in a store-box by store-box approach which would have meant revisiting the same parts of the main series at least six times to add material from all of the collections separately. So, specimens of each family group were transferred from all of the store-box collections simultaneously.

The following work sequence of families and super-families was adopted for the project, commencing with the Chrysomeloidea and ending with the aquatic Hydrophiloidea. The number in brackets is the approximate number of British species in each family:

Chrysomeloidea (269), Cerambycidae (63), Silphidae (20), Tenebrionoidea (139), Elateroidea (80), Scarabaeoidea (92), Buprestidae (14), Cantharoidea (49), Gyrinidae (12), Haliplidae (19), Dytiscidae(111), Carabidae (364), Hydrophiloidea (aquatics) (68)

The unit trays were composed of acid-free card of standardised external dimensions 12cm x 7cm x 2 cm. Each was fitted with a glued insert plastazote base 5mm thick. 18 trays fitted into each Hills cabinet drawer. In the unit tray drawers, trays were created for species which are not currently represented in the collection but which may feasibly at some later date be acquired by the Museum. Trays were not prepared for long-extinct species for which there is no Leicestershire County Council Museums material. One or two empty trays were placed at the end of each drawer to allow for future expansion of the collection.

For beetle families that had already been laid out in unit trays prior to the project, a system had been adopted whereby Leicestershire material had been split off from other UK material and the tray labelled with a red card disc and a label reading 'Leicestershire'.

In order to fit the store-box material into the main series without far exceeding the cabinet capacity in the stores, a decision was made to remove the majority of these labels and to reincorporate Leicestershire material back into the main series for each species. Exceptions were made where species vouchers from Leicestershire were Nationally significant or where trays marked with Leicestershire labels were already full. These were simply left 'as is'.

Unfortunately, re-amalgamating the Leicestershire material with other main series material makes the collection less accessible to people who want to extract Leicestershire data only. However, given the limited capacity for expansion of the collection, no other option was available. The checklist sourced for labelling up unit trays and drawers was Duff (2008).

Generally, the old species-name labels present in previously organised unit trays, were left in situ unless a species name change in the nomenclature warranted an up-to-date label. Any newly laid out trays were usually pinned with a new label. Composite mounts were placed in drawers positioned at the very end of the Coleoptera series. The Henderson collection was not included in the project, although it was consulted to extract Red Data Book specimen data. Given the time restrictions and complications, a large quantity of outstanding store-box material was expected at the end of the project. This quantity was estimated at approximately one third of the store-box collection.

Results

Over the course of around 90 days, 41,400 specimens were identification-checked and re-organised or transferred into the main series (Fig. 13). Within this total, 22,300 were moved from store-boxes. 4,846 previously unidentified specimens were identified and 1,633 previously identified specimens were re-determined (Fig. 14). All 6,479 of these were labelled with det. labels. Identification keys used were mainly Royal Entomological Society Handbooks, with the addition of a number of papers from a variety of entomological journals.



Fig. 13. Checking identification of Carabidae. (Image © Leicestershire County Council Museums)



Fig. 14. Re-organising specimens in unit trays. (Image © Leicestershire County Council Museums)

Of the previously unidentified material, the Hunt collection produced a handful of species which were not otherwise represented in the collections. Examples are a specimen of *Ischnomera caerulea* (Oedemeridae) from the New Forest, Hampshire and two specimens of *Bradycellus distinctus* (Carabidae) from Deal, East Kent. This highlights the importance of processing unidentified material rather than leaving it to languish in obscurity.

Accession labels were attached to 5,766 specimens and 4,719 specimens were catalogued. At least 60 store-boxes were emptied and stockpiled for future sale by the Museum. At the end of the project, the Coleoptera occupied 27 cabinets and a total of 261 drawers within these cabinets. This saw the main series expand by around 3 cabinets.

The work being carried out generated a number of enquiries from National Recording Scheme organisers and experts in particular beetle groups. This prompted us to post all of the Red Data Book species data for groups that had been worked on, onto the internet newsgroup beetles-britishisles@yahoogroups.com. Further enquiries were generated once the data had been released.

Richard Wright, a local entomologist, visited the Museum on a number of occasions to take photographs of species for a new CD-Rom British beetle identification guide. He also assisted the contractor at the end of the project, in photographing every drawer of Coleoptera in sequence (e.g. Fig.15). These photographs were then processed to produce an interactive visual catalogue of the entire main series. Magnification of the photographs allows for species labels to be read and for species numbers to be counted, but it is not generally powerful enough for critical species identification.

A number of close-up photographs were taken of certain ‘photogenic’ beetles such as the *Ampedus* genus (Elateridae) (Fig. 16), to show greater detail of layout. The rove beetle (Staphylinidae) collection was in constant use by Derek Lott who was writing sections of his Royal Entomological Society Handbooks for the Identification of British Insects keys. A collection-led workshop on Ground Beetles (Carabidae) held at CRC during the term of the project, benefited from the re-organisation of the collection.

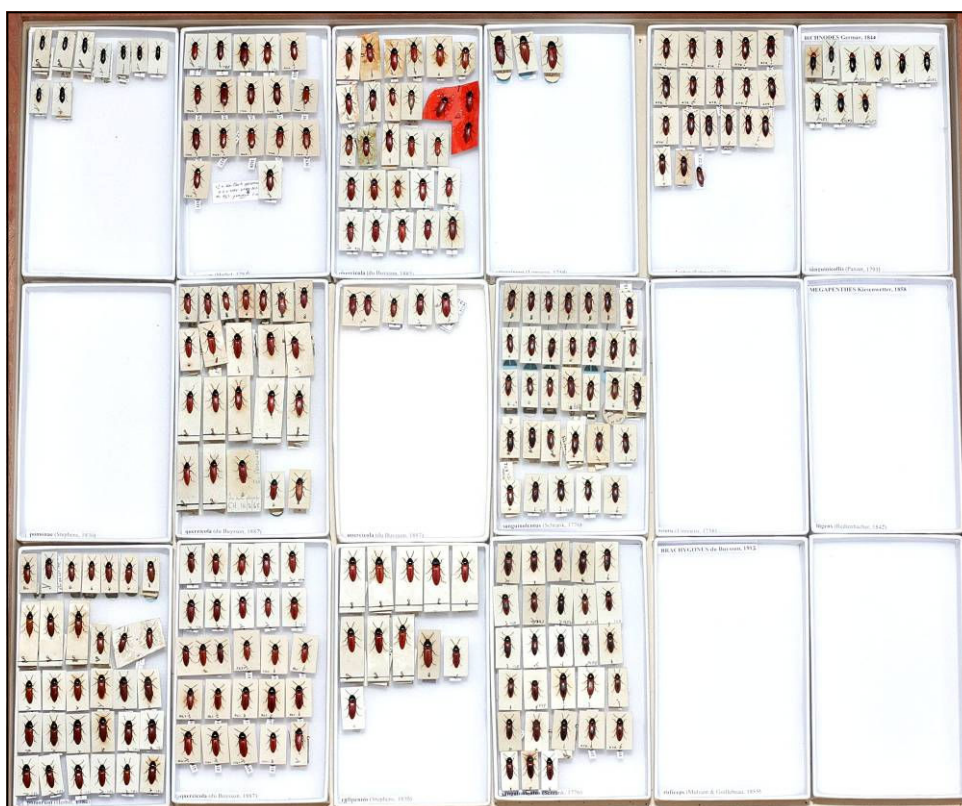


Fig. 15. An Elateridae drawer after reorganisation. (Image © Leicestershire County Council Museums)



Fig. 16. Detail of the same drawer as Fig. 15. (Image © Leicestershire County Council Museums)

Recommendations for Future Work

Further work to transfer and re-organise the remaining 31,617 specimens is essential if the work already carried out on this significant collection is to be completed. This work will produce further useful data for scarce species, enhance the overall accuracy of the collection identification and remove the need for store-box storage. The expansion space required for this additional work is already provided for by nearly three empty cabinets (26 drawers).

The value of any collection lies in the range of species represented, the presence of good data and the reliability of identification. Inaccuracy in identification effectively renders a collection inaccessible. Although identification was carried out extensively during the project, a number of ‘difficult’ species complexes were not checked because of time limitations. There are also a number of species that require dissection to confirm their identity. Future work might include specialist attention for these species groups.

Access to collections is a major consideration for their continued presence in Museums. Access can take many forms, from academic research through to community-based learning and exhibitions. The design of the best collection-led learning material requires a blend of academic or specialist knowledge of the collections, coupled with a creative approach in interpretation of that material. It is also important to identify the requirements and expectations of any user group before the material is developed. There is great potential for collections use at CRC and despite space and staff resource limitations, there are exciting future initiatives to develop the entomological collections for exhibitions and events.

One of the most important functions of a collection is to provide reliable data that can contribute to our understanding of species distribution and inform future species conservation projects. A database catalogue of Red Data Book, BAP species and Nationally Scarce species, would be useful for this purpose and key to improving collections access for researchers.

The Hunt collection material has suffered from extensive mould growth as a result of inappropriate storage. Perhaps up to 25% of this collection is affected. Some specimens are so densely covered in mould that the beetles are obscured. Otherwise, the majority are affected by grime. It would be advantageous to selectively clean specimens from the Hunt collection, prioritising Nationally scarce and Red Data Book species for this process.

Pest infestation is a constant threat in Museum stores, particularly since the use of pesticides has been phased out. The author was once advised that the best form of prevention for pest infestation is to regularly use the collection. This is good advice, but it is rare for all parts of the collection to receive the same level of regular attention. As a preventative measure, it would be prudent to freeze drawers on a rotational basis, commencing with the first drawer of the first cabinet and working through the collection. In addition, random sample checks for pests should be carried out as part of a pest-monitoring programme. At Barrow, such pest checks are already carried out as part of a wider housekeeping routine.

Acknowledgements:

The project was funded through Leicestershire County Council Museums' Accreditation and Conservation Budgets, and thank you to all the staff for their kind assistance with this project.

References:

Duff, A.G., 2008. *Coleoptera Checklist of the British Isles, 2008 Edition*. Available at www.coleopterist.org.uk

Kloet, G. S. and Hinks, W. D. 1945. *A checklist of British Insects*. Buncl & Co., Stockport.

Lott, D.A., 2009. *The Leicestershire Coleopterists*. Loughborough Naturalist's Club.

Mann, D.J. and Barclay, M.V.L. 2009. The Identification and Distribution of *Cryptocephalus biguttatus* (Scopoli) and *C. bipunctatus* (Linnaeus) var. *thomsoni* Weise (Chrysomelidae) in Britain. *The Coleopterist* **18** (3): 166 – 181.