## NatSCA News

---

Title: The Historical Repairs Of Butterflies And Moths From The Eighteenth Century Collection Of William Hunter, University Of Glasgow

Author(s): Brown, G. & Hancock, E. G.

Source: Brown, G. & Hancock, E. G. (2007). The Historical Repairs Of Butterflies And Moths From The Eighteenth Century Collection Of William Hunter, University Of Glasgow. *NatSCA News*, *Issue 12*, 15 - 19.

URL: http://www.natsca.org/article/207

---

# The Historical Repairs Of Butterflies And Moths From The Eighteenth Century Collection Of William Hunter, University Of Glasgow

**Georgina Brown and E. Geoffrey Hancock**
**Hunterian Museum (Zoology),**
**University of Glasgow**

## Introduction

The eighteenth century insect collection of William Hunter (1718-1783) was left to the University of Glasgow in 1783, being part of his museum in Windmill Street, London (Bynum & Porter, 1985). This bequest has been housed in the Hunterian Museum since 1807. The collection numbers around 7,600 specimens and is of significant historical interest with many specimens collected during the voyages of Captain Cook, for example, and other explorers (Hancock, 2005a; 2005b). In 2005 the Leverhulme Trust provided funding for research to be carried out on this extensive insect collection.

Part of the project involved the transfer of insects from their original drawers into new conservation-grade drawers and cabinets. A substantial part of the importance of Hunter's collection lies in it having been in the original drawers and with a contemporary manuscript catalogue of the specimens. The arrangement of the individual insects within the drawers, in relation to each other and the cabinet labels, has been recorded in detail. As a result of examining each specimen and photographing it *in situ* it could be seen that some specimens had been attacked historically by insect pests or otherwise damaged to varying degrees. However, one of the noticeable features of the collection is the numbers that are in a good state of preservation given their age of at least 200 years. In several instances this appearance was superficial and relied on some remarkable and effective repairs that have been carried out.

## Background

William Hunter's collection contains many specimens that were collected geographically distant to Britain including places in Africa, Madagascar, China, India, South America, the West Indies and Australasia. Hunter was neither a practicing entomologist nor did he travel to any of these places. He obtained his specimens either by commissioning collectors or indirectly as gifts, purchases or exchanges with other collectors. He and some of the other collectors in London relied on a network of European naturalists and explorers, ships' captains or surgeons to collect specimens during their travels. Hunter had former pupils from his school of anatomy in London. After qualifying as doctors some of them traveled widely with the navy or army.

The wings of insects are thin structures, mostly composed of chitinous epidermal layers supported by veins. The surface structure of butterfly and moth (Lepidoptera) wings are of a powdery appearance due to overlapping scales (modified hairs) like microscopic roof shingles (Scoble, 1995). These scales are responsible for species characteristic colouration and pattern. The delicate nature of scale attachment to the wing and vein surfaces means that any physical contact irreversibly removes them. It has been noted that several butterflies and moths in Hunter's collection have very obvious fingerprints on some wings, acquired either during the act of capture or from later handling. Catching by hand would usually leave evidence such as the finger or thumb print on opposing surfaces of the butterfly's wings as it is gripped to prevent escape. Damage of this nature on one surface may be more likely to occur during spreading the wings on a board during pinning or any time thereafter during handling the preserved specimen. It is intriguing that in more modern times a collector could be identified from this evidence. Could the Hunterian specimens from Australia bear the fingerprints of the great Sir Joseph Banks? He was collecting there between May–August of 1770 when the Endeavour was on the east coast, the first expedition to collect insects from that continent.

## Types of repair

*The repairs can be divided into a number of categories, depending on the damage or problem with the specimen.*

### *Reattachment of existing parts*

Various insect parts such as the legs, antennae, head, thorax or abdomen that had broken off have been reattached using water soluble glues. Sometimes this was used to excess and occasionally the wrong bits were glued together or re-attached wrongly. The same method was used if the entire wings had broken off at their bases. The glue has not been analysed but has the appearance of animal glue and may have been used hot

which might have been difficult to apply in small quantities.

**Replacement of missing parts**

Missing parts were carefully replaced in some of the insects in Hunter's collection and this was carried out with some expertise. In one butterfly the entire body (thorax and abdomen) has been replaced by one constructed from an unknown material, possibly cork or wood, painted black. The wings and head of this *Morpho* butterfly were then reattached to the false body and the whole then pinned in the usual way for display (Fig. 1).

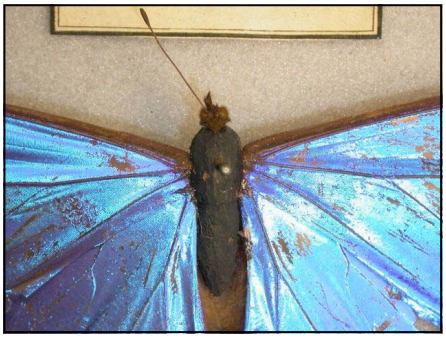

Fig. 1. *Morpho* butterfly showing false body.

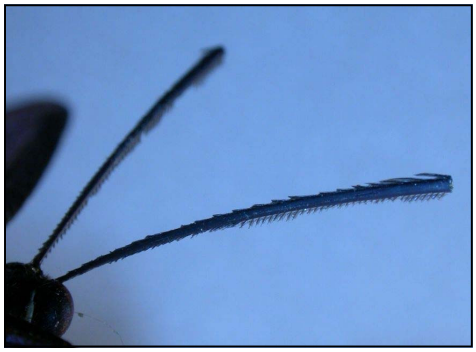

Fig. 2. *Morpho* butterfly with antennae made from feather quills

Another interesting historical repair has been found on a different *Morpho* specimen, although this example is later in date and not from Hunter's collection. A replacement set of antennae has been created from fine feathers with the barbs trimmed from the shaft. The thinner ends of two prepared shafts have been carefully attached to this butterfly's head giving an acceptable representation of antennae (Fig. 2).

***Patching***

Missing sections or holes in the wing membrane required more complex procedures. Several Lepidoptera from Hunter's collection exhibit such repairs to this damage. Such a situation could have occurred from rough handling during collecting, transport or when specimens were later swapped or sold. The commonest way to repair damaged wings was to make a patch and the material used for these old repairs consisted mainly of pieces of butterfly wing. These might be cut from the wings of the same or similar locally found species. They were selected and cut out with great care in order to match the shape of the damaged area and the surface colour(s). In the example shown in figures 3 & 4, there are several patches that have been carefully glued to the wing. Although these are obvious when seen from underneath, they are virtually invisible when the butterfly is viewed from its pinned position and so the specimen remains aesthetically pleasing in the cabinet.

Fig. 3. Underside of a *Papilio paris* wing showing patches

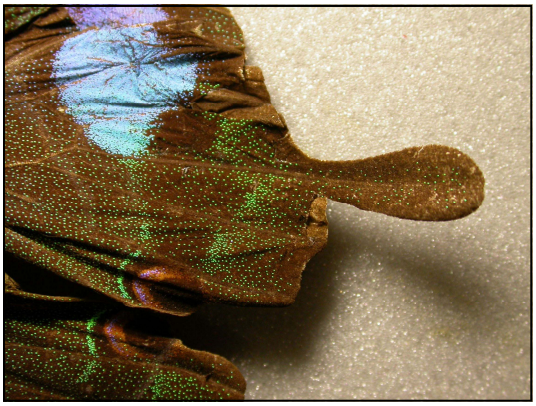

Fig. 4. Repairs on *Papilio paris* are almost invisible when viewed from the upper side

Support behind the patch was provided by other butterfly species of almost any kind, regardless of colour, shape or thickness. A pair of Madagascan Swallowtail butterflies from Hunter's collection (*Papilio antenor*) is of particular interest in this context as the entire wings of British butterflies, commonly found in or near London during that eighteenth century have been used for repair. One of these species is the black-veined white (*Aporia crataegi*), a butterfly that is now extinct in Britain but was then "plentiful and fine on the chase" according to Dru Drury (1725-1803), as quoted by Salmon (2000). The other is the silver-washed fritillary (*Argynnis paphia*). The details of these specimens of *P. antenor* and its discovery as a species are being investigated in more detail for a separate publication.

Fig. 5. Mica repair to the wing tip of the moth *Rothschildia hesperus*

Support to damaged wing membranes, using very thin plates of mica, have been found. These were either torn or cut to shape and glued into place, providing an almost invisible repair to a wing that was torn or had a small hole in it. Not only is mica naturally transparent, thus allowing the original wing colour to show through, but it also gives a very strong and flexible support to the wing (Fig. 5). It has been noted that early collectors sometimes preserved their Lepidoptera specimens between slips of mica sealed with passé partout. James Petiver (1663–1718) is well known for making use of this method of preservation and it was used also by Sir Hans Sloane (1660–1753) and others (Salmon, 2000). The use of mica for repairs does not appear to have been observed before and these examples in Glasgow remain unique for this purpose. What is interesting about this discovery is that it may not have been used before or since. Mica is light, strong, chemically inert, can be bonded with water soluble adhesives, occurs naturally and is extremely cheap to buy. Theoretically it can be split into sheets of ever decreasing thickness down to the molecular level, certainly beyond the needs of any conceivable application in the context of most kinds of repair. Perhaps today we are too ready to seek man-made materials, not having investigated natural ones.

Paper has also been used to repair the wings of Lepidoptera. A particularly skilled example of this was found in a large birdwing butterfly, although not from Hunter's collection. The undersides of one fore wing and one hind wing have pieces of paper that have been neatly cut to shape and glued onto the areas that required repair. The paper surface exposed on the upper wing surface was then painted in water colour to match exactly the patterns on the wing (Figs. 6 & 7). There are some specimens in Hunter's collection in which paper has been used to support damage which is not visible from above

Fig. 6. Paper repair to the underside of the birdwing butterfly *Ornithoptera priamus*.

Fig. 7. Paper repair of *Ornithoptera priamus* seen from above showing hand painted detail.

**Supports**

Several methods were used to support specimens that are loose on the pin or where gravity has become a problem. There can also be weakened areas when physical or pest damage has occurred and where splits or tears cause sagging. An extra pin was sometimes inserted laterally underneath the thorax at right angles to the main pin, the protruding ends supporting the wings from below. A small piece of resin, wax, cork or blob of glue was sometimes used to keep the specimen from slipping down or swiveling on its pin. Glue applied to the space between overlapping areas of wing keeps them together thus supporting each other.

**Dates for repairs**

Repairs are described for insects in William Hunter's eighteenth century collection. The time when these took place is thought to be within the period that the collection was in London and so before 1807 at least. As described earlier (Hancock, 2005a) after the collections were transferred to Scotland they do not appear to have received much curatorial attention until the beginning of the twentieth century. This apparent neglect may well have been an advantage as the original arrangement remained substantially undisturbed.

It was because obtaining exotic specimens was so difficult and often from places hazardous to collectors, that repairs would have been carried out to preserve the appearance of any specimens acquired in the cabinet. The possibility of replacing any insects with fresh or undamaged examples was effectively not feasible. The intricate repair work on the insect collections of William Hunter reflect the difficulty of obtaining some species, usually those from remote parts of the world. Considerable efforts were made, especially with the Lepidoptera, to repair and thus preserve these early specimens. Butterflies suffer damage which is immediately obvious to the collector mainly due to their large wing area and delicate nature. Their aesthetic value is paramount within a collector's cabinet. As the nineteenth century progressed fine quality specimens were more readily obtained and so the necessity to repair all but the rarest of species was removed.

Fig. 8. The millipede, *Scolopendra dorsalis,* before cleaning and repair.

Fig. 9. The millipede, *Scolopendra dorsalis* with segments separated.


Fig. 10. *Scolopendra dorsalis* after repair.

We have seen similar wing repairs in other contemporary collections such as that of Louis Dufresne (1752-1832) in the National Museums of Scotland, although none include the use of mica. In practice, the nature of the problems and the solutions are broadly similar to ones that an entomologist might use today. Although conservation grade substances such as Japanese tissue (e.g. Moore, 2007) and special adhesives are now marketed, found material can be very effective. One of the authors (EGH) has used dry grass stems for supporting dragonfly abdomens in recently collected material. The combination of lightness of the stems and the strength of a cylinder is ideal for the purpose. Such usage is similar to that of mica – opportunistic and effective.

Not all repairs found in Hunter's cabinets are equally effective, attractive or correctly executed. A specimen of a millipede was not only wrongly aligned but was actually an amalgamation of two different examples (Figs. 8,9 & 10) and its cabinet label had been transposed from another species. After the old glue was removed (it came away easily by physical means) and the broken parts were re-joined. The collection has now been catalogued as containing two syntypes rather than one. Neither one is now complete but each qualify as original examples of *Scolopendra dorsalis* Fabricius, 1781. They are from Coromandel, India *ex* T.P. Yeats' collection. Fabricius, in common with others at the time, classified non-insect terrestrial invertebrates as the Aptera and included them with Insecta. The Trustees Catalogue, a manuscript of 1783-1785, lists two specimens of this millipede which confirms that the repairs took place after this date. It is probable this repair was subsequent also to the time when Fabricius was active in London as he would hardly have approved of such a bad repair. His last visit was in 1791. The nature of this specimen compared to the quality of other repairs to the butterflies at least reinforces our opinion that it was carried out more recently. By collary, the high quality repairs of insects from distant countries were of earlier origin.

**Acknowledgements**
This work is part of the Leverhulme Trust research funding (F/00 179/AA) into the historical and scientific context of William Hunter's eighteenth century insect collection.

**References**

Bynum, W.F. & Porter, R., (editors). 1985 William Hunter and the eighteenth century medical world. Cambridge: Cambridge University Press.

Hancock, E.G. 2005a. William Hunter's Insect Collection and emerging descriptive taxonomy in the Eighteenth Century. *Natural Sciences Collections Association News* **4**: 8-13.

Hancock, E.G. 2005b. William Hunter's Insect Collection, Addition and Appendices. *Natural Sciences Collections Association News* **5**: 9-10

Moore, S. 2007. Japanese Tissues: Uses in repairing Natural Science Specimens. *Society for the Preservation of Natural History Collections.* Fall 2006, Vol. 21, Numbers 1-2.

Scoble, M. J. 1995. *The Lepidoptera: Form, Function and Diversity*. The Natural History Museum / Oxford University Press.

Salmon, M. A. 2000. *The Aurelian Legacy*. Harley Books.