

## Plagiarism or pragmatism - who cares? An analysis of some 18th century dragonfly illustrations

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Moses Harris (1731-1785), a Londoner, was a brilliant water-colourist and in his time a leading entomologist in England. Harris wrote and illustrated the famous insect books *The Aurelian or natural history of English insects* (1766) and *An exposition of English insects* (1776-1780, second edition 1782). He is also regarded as being the inventor of the first organized colour wheel, which was published in his book *The natural system of colours* (1766), 94 years after Isaac Newton had identified the spectral colours by refraction of white light using a glass prism. Harris also engraved most of the 150 copper-plates for Dru Drury's *Illustrations of natural history*, a book depicting mainly exotic insects, which appeared in three volumes in 1770, 1773 and 1782. His contribution to this work tends to be less well known, as in an extraordinary act of egotism, Drury not only failed to acknowledge Harris, but expropriated artistic credit by prominently claiming to have personally directed the execution of the artwork. Harris' contribution is indicated only by his signature on some plates. In the second edition (1837) of Drury's work (re-titled *Illustrations of exotic entomology*), Harris' contribution was handsomely acknowledged in a footnote in the preface written by the editor J.O. Westwood.

For many odonatologists Moses Harris is best known as the author of the Banded Demoiselle, *Calopteryx splendens*, which he described in 1780 in *An exposition of English insects*. This is the first of only four dragonfly species<sup>1</sup> currently recognised to have been described originally from the British Isles and certainly one of the most beautiful of European odonates. In 1780 Harris also described several other new species and it is possible that his descriptions and illustrations of '*Libellula coluberculus*' and '*Libellula aereus*' were the first of the species presently known as *Aeshna mixta* Latreille, 1805 and *Enallagma cyathigerum* (Charpentier, 1840), respectively. However, later authors were not quite sure of their identity (Lucas, 1900) and therefore these names have not been adopted.

Apart from Thomas Mouffet's (1634) black and white drawings of a *Calopteryx splendens* male and a *Libellula depressa* male, Harris was the first English author to illustrate dragonflies identifiable at the species level. Although some of his dragonfly drawings were not especially good, others were superb, such as those of the aeshnids: 'Large brown' (without scientific name), presently known as *Aeshna grandis* (Fig. 1) and 'Large green' (without scientific name), presently known as *Aeshna cyanea* (Fig. 2). The perfectly natural colours of the eyes indicate that Harris had examined living individuals of these aeshnids and either coloured the printed copper plates himself or supervised the colourists. Harris was also the first to illustrate (Fig. 3) and describe the Golden-ringed Dragonfly. Unfortunately he identified it erroneously as *Libellula forcipata*, a species named by Linnaeus in 1758, presently known as *Onychogomphus forcipatus*. Edward Donovan (1807) described *Libellula boltonii* (presently *Cordulegaster boltonii*) with a fine illustration of a male (Fig. 4), which he depicts in a dramatic pose among vegetation in the act of devouring a moth. Donovan represented the colour of *boltonii* eyes as brown,



**Fig. 1.** Extract from Plate XII from *An exposition of English insects* by Harris (1780), showing the 'Large brown'. No scientific name was given for this male specimen of *Aeshna grandis* (Linnaeus, 1758).



**Fig. 2.** Extract from Plate XVI from *An exposition of English insects* by Harris (1780), showing the 'Large green'. No scientific name was given for this male specimen of *Aeshna cyanea* (Müller, 1764).

<sup>1</sup> The other species are *Cordulegaster boltonii* (Donovan, 1807), *Anax imperator* Leach, 1815 and *Oxygastra curtisii* (Dale, 1834).

typical of dead cabinet specimens, but Harris obviously used his imagination and coloured the eyes a deep blue not unlike those of *Aeshna grandis*, suggesting he probably never saw the living dragonfly with its splendid green eyes.

At this stage the reader may be wondering what is the significance of the first part of the title of this article. It is thus – In his ‘*Exposition*’ Harris also illustrated several larvae as follows: On Plate XII a larva of the ‘Large brown’ (*Aeshna grandis*), on Plate XXIX a larva of *Libellula lugifugus* (*Coenagrion puella*) and on Plate XXX a larva of *Libellula splendeo* (*Calopteryx virgo*). Only the demoiselle larva illustration is of adequate quality, the others are poor, as already pointed out by Lucas (1900), and far from Harris’ normal standard. It is evident that Harris did not illustrate these larvae from specimens, but at least two of the larval figures in *Exposition* were copied from the colour plates of the second part of August Johann Rösel von Rosenhof’s *Insecten-Belustigung*, which was published in 1749. The *Insecten-Belustigung* was an extraordinary tour de force covering all aspects of European entomology, and to a large degree building on the celebrated 1734-1742 *Mémoires pour servir à l’histoire des Insectes* by René Antoine Ferchault de Réaumur, often regarded as the father of entomology. Rösel’s volumes are richly illustrated with coloured copperplate engravings which showed much detailed structure and biology of all insect groups as well as serving as an identification guide, although at the time of its publication binomial Linnaean names had not yet come into use.

The strongest similarity is in the depiction of the larva of *Calopteryx virgo*. Figure 5 shows at the top, Rösel’s original earlier depiction, at bottom Harris’ image as it was reproduced, and in the centre the same image reversed. Despite some small differences in the angles and length of segments of the legs there can be little doubt that Harris’ image is modelled on that of Rösel, perhaps even traced. There is an equally striking likeness between the image of the larva of *Coenagrion puella* (Fig. 6). Again at the top figure is Rösel’s earlier depiction, at the bottom is Harris’s version, and in the centre the latter image is reversed and rotated. Despite small differences in the length and position of the legs, it seems again highly likely that Rösel’s drawing was the model for that of Harris. Indeed the latter is so sloppy, with its right foreleg emerging from the head, one wonders if the process of copying was not distasteful to Harris. Finally, the very first larval image in the ‘*Exposition*’ (Fig. 7) shows a very stiff dorso-lateral lateral view of an aeshnid larva with mask extended. No attempt has been made to depict the eyes, antennae or hinge on the mask or labial palps, all inconceivable omissions for an artist of Harris’ talent had he actually examined a specimen. A model for this sketch is again to be found in Rösel (1749), where an entire plate (Tab. III) is devoted to the development of the larvae of *Aeshna grandis* from early instars to maturity. Three large (F) larvae are depicted: one otherwise at rest, but showing clearly expulsion of water from the anus; one striking directly forward at a mayfly larva; and one striking laterally in a dramatic movement at a different ephemeropteran species. Detailed enlargements of the extended and retracted mask are also shown. Rösel’s next plate (Tab. IV) shows in detail the emergence of this species from the exuviae. Harris has probably based his own drawing of *Aeshna* larva on the frontally striking example in the first plate. Terming the larvae as ‘caterpillars’, Harris also describes the mode of operation of the mask, which if he had never seen it, was surely based on Rösel’s account. From Rösel’s illustrations and text it is clear that he must have read and been inspired by Réaumur (1742), who illustrated the mask of ‘nymphs’ of Odonata, which Rösel acknowledges. Réaumur also figures the emergence of an aeshnid in several stages, and the stages of copulation and oviposition



**Fig. 3.** Extract from Plate XXIII from *An exposition of English insects* by Harris (1780), showing the female of ‘*Libellula forcipata*’, which is Harris’ misidentification of the species presently known as *Cordulegaster boltonii* (Donovan, 1807).



**Fig. 4.** Donovan’s (1807) plate [430] showing a male of ‘*Libellula boltonii*’, presently known as *Cordulegaster boltonii*.

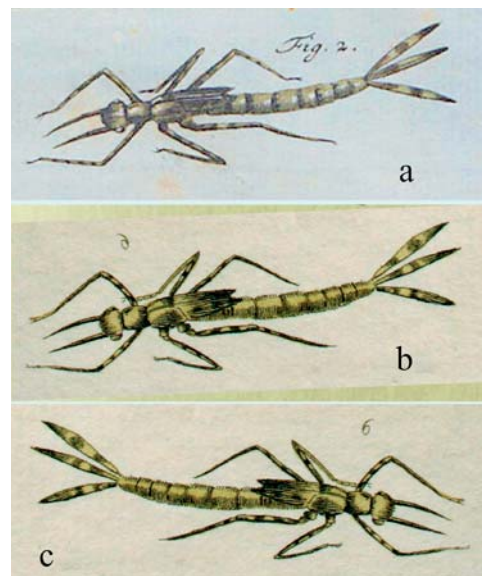


in a coenagrionid. Rösel illustrates these same events too, although in less detail in the latter case, but in no way could it be suggested that Rösel copied Réaumur's drawings. Rösel's drawings clearly bear the stamp of his own style and attest to close observation in the field. He also collected larvae from the field and reared them to maturity in an aquarium where he could observe their behaviour closely. He would thus have been able to see at first hand 'jet propulsion' and the explosive extension of the mask when catching prey.

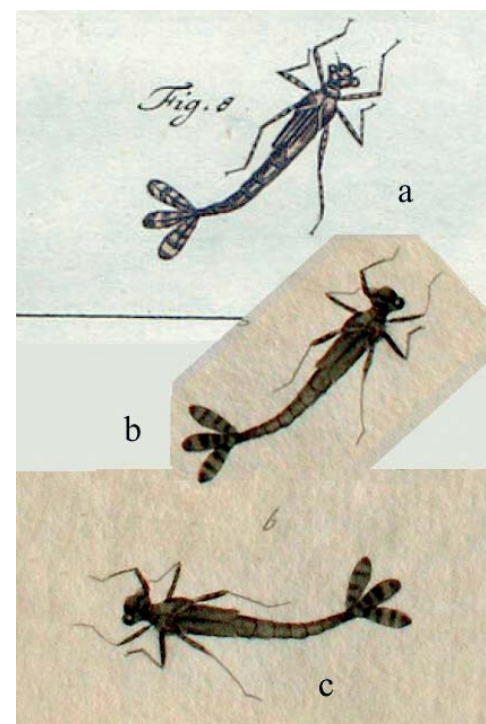
Two more images by Harris suggest a strong influence by Rösel. They both appear in Plate XXVII of *The Aurelian* of 1766. One shows a gomphid larva, probably *Gomphus vulgatissimus*, which appears in a plate by Rösel (Tab. VII, Fig. 2), in the text wrongly linked to the male libellulid dragonfly (*Libellula depressa*) which is depicted on the same plate (Tab. VII, Fig. 3), together with an unidentifiable libellulid, perhaps a female *Orthetrum coerulescens* (Tab. VII, Fig. 4). A very similar larva, evidently an inverted and rotated version of Rösel's image, is shown underwater by Harris, together with the same two adult dragonflies as appear on Rösel's plate (Tab. VII). These however are sufficiently original and fresh to suggest Harris drew them from his own material. Nevertheless it would appear that by copying from Rösel, Harris repeats the former's error in associating a gomphid larva with an adult libellulid. Harris also depicts a libellulid, probably meant to be *L. depressa*, emerging from its exuviae. This bears an uncanny similarity with a figure by Rösel on his previous plate (Tab. VI Fig. 3), depicting the (reversed) emergence of this species together with an adult female. The exuvia itself is clearly not an exact copy, nor is the substrate on which it is fixed, but the emerging adult shares many similarities with Rösel's figure. Perhaps Harris had access to exuviae but had never actually witnessed an emergence. The case is open. Finally, in *The Aurelian*, Harris figured numerous larvae and pupae of Lepidoptera. Only one bears any likeness to Rösel's illustrations. This is the larva of The Camberwell Beauty *Nymphalis antiope*, a species which does not breed in Britain. As with other suspected copies, it is reversed.

We must stress that in making these observations we do not in anyway seek to impugn Moses Harris' reputation as an entomologist or as an artist. Rather we believe they shed light on his methods of working and as such are of historical interest. Any author or artist who is attempting a general work of entomology may at some stage need to depict material from secondary sources, and this was true even in the late 18<sup>th</sup> century. It is interesting that Harris saw the need to reverse the images, a ploy still used today to avoid copyright infringement, and by the poor quality of the copied images, we may conjecture that he did not greatly enjoy having to resort to this method of illustration.

It is probable that to some extent Harris was influenced and perhaps inspired by Rösel but also clear that he preferred to work from nature. In general his images are livelier. His Lepidoptera especially are often portrayed in flight with wings flapping. His adult Odonata tend to look crisper and more animated. Rösel on the other hand provides more accurate detail. The sock-like anal loop of the libellulid hindwing is present in several of his images, but their wings are rather limp, perhaps an attempt to convey life-like flexion. In fact Harris' stiffer wings are more convincing in this regard despite being less accurate in detail. Both Rösel's and Harris' drawings are an enormous improvement on almost all prior attempts to show venation. Despite his beautifully detailed and accurate drawings of internal anatomy and skeletal details the great Réaumur depicted odonate wing venation almost like a fishing net.



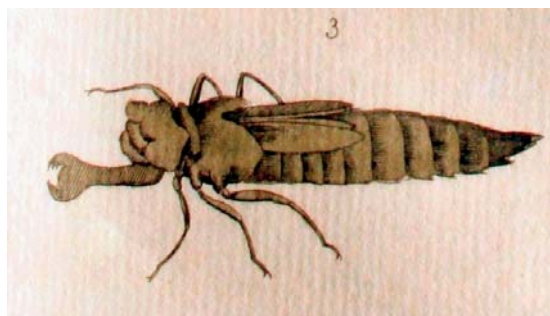
**Fig. 5.** Details from Rösel's '*Insecten-Belustigung*' and Harris' '*Exposition of English insects*' showing: (a) one of Rösel's figures of *Calopteryx virgo* larvae, (b) Harris' corresponding figure reversed and slightly rotated to show the similarity to that of Rösel's, (c) Harris' figure of *C. virgo* as it appeared.



**Fig. 6.** Details from Rösel's '*Insecten-Belustigung*' and Harris' '*Exposition of English insects*' showing: (a) one of Rösel's figures of *Coenagrion puella* larvae, (b) Harris' corresponding figure reversed and rotated to show the similarity to that of Rösel's, (c) Harris' figure of *C. puella* as it appeared.

It may be that Harris was simply more interested in the Lepidoptera than in Odonata and so observed them more keenly. He is best remembered for *The Aurelian or natural history of English insects: namely moths and butterflies together with the plants on which they feed*, which was completed in 1766. This is very much a celebration of living insects and their interaction with their host plants. The four images of odonates which appear on one of its 44 plates seem to be there almost by accident. We may conjecture that he observed butterflies in nature a great deal, and dragonflies a little. Later, he published an essay on the wings of butterflies (Harris 1767), in which he proposed a new classification of butterflies and moths based on the arrangement of veins in the wings.

Moses Harris died around 1785, leaving a wife and at least one child, John Harris (1767-1832) who was also a noted watercolour painter and illustrator.



**Fig. 7.** Detail from Harris' *'Exposition of English insects'* (Plate XII, Fig. 3) showing a remarkably crude representation of an aeshnid larva.

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<sup>2</sup> He acquired the honorific 'von Rosenhof' in 1753.