A micro-moth with 'eight antennae': an amusing focus-stacking artefact.

Martin B Skirrow

Focus-stacking is a technique used in macro photography to achieve a full depth of focus in a subject. Multiple exposures are made, each in a different focal plane, and the resulting pack is then processed in an advanced computer programme to produce an image of the subject in sharp focus throughout. This is a lengthy process usually practised only by experienced photographers, but it has now become available in a form that anyone can use. The Olympus Tough TG-4 is a remarkable little general purpose camera that has a macro programme with a built-in focus-stacking facility. In this setting, a press of the exposure button fires off eight rapid exposures in advancing focal planes, all within about one second. Then one waits a few more seconds for the in-built software to compute the final image, and hey presto, there is the whole of your subject in sharp focus. To me it is a minor miracle and a huge advantage for those of us studying invertebrates, indeed for botanists and any others engaged in macro photography.

The above photo (01) was accidental. I was trying out my newly acquired TG-4 on a small micro-moth, *Calybites phasianipennella*, which I had caught in a light trap on Sept 24th 2017. Initially it was torpid and I obtained a reasonable photo while it remained still (a static subject and steady camera are obviously essential for successful focus-stacking) (02). Then it began to rouse and wave one of its antennae about just as I took another shot, so the single antenna was photographed in a new position for each exposure, thus giving the false impression of eight antennae. They say a camera never lies, but human ingenuity can spoil this reputation.

01. *Calybites phasianipennella*. Martin Skirrow.

02. *Calybites phasianipennella*. Martin Skirrow.

Acknowledgements
I am indebted to Harry Green for introducing me to the TG-4 camera.

Disclaimer: I have no vested interest in the Olympus camera company!

Editor's Note
To give due credit all this is down to Rosemary Winnall who 'discovered' this miracle and passed on the information. I have struggled with depth of field micro and macroscopic pictures for years and never ventured into proper stacking technology, Very soon after Rosemary told me about the camera I purchased one. Having tried it I passed the information to Martin. Harry Green.

Image
01. *Calybites phasianipennella*. Martin Skirrow.
02. *Calybites phasianipennella*. Martin Skirrow.