



MANCHESTER MICROSCOPICAL SOCIETY NEWSLETTER

Micro Miscellanea

Newsletter of the Manchester Microscopical and Natural History Society

May 2020

Additional unpublished articles now available ([September 2023](#))

My favourite microscope – Dancer Binocular (Graham Marsh)

Lockdown activity – Smartphone Microscope Adapter (Mike Mahon)

Lockdown ! – No Excuses left but to try out a Smartphone Microscope Adapter ... and write a Newsletter Article

Mike Mahon

After numerous disappointing attempts at trying to take decent pictures by holding a smartphone very still over a microscope eyepiece and, having no engineering skills whatsoever to make my own clamp, I decided I needed to buy a ready-made adapter.

Why do I need one? Well smartphone cameras nowadays have very high resolution cameras with over 12 million pixels, they are quicker to use than setting up a laptop and c-mount camera or fixing up an SLR camera and transferring all the images, and you can immediately show others locally or distantly what you are looking at. Also you can let other users have a go and take away their own images thus enthusing them into microscopy.

Specifications. I decided the adapter needed to fit my standard compound biological microscope eyepieces and any trinocular mount (so needs to fit 23.2 mm), and also a stereomicroscope (so needs to fit 30mm). Also those pesky but excellent Russian microscopes with a 30.2mm eyepiece socket or larger could be used for photomicrography at last. I wondered if I could fit it as well to a bird spotting telescope I have with a 49.5mm diameter eyepiece! These are just the inner tube dimensions, the outer diameters of the top of the eyepiece vary even more.

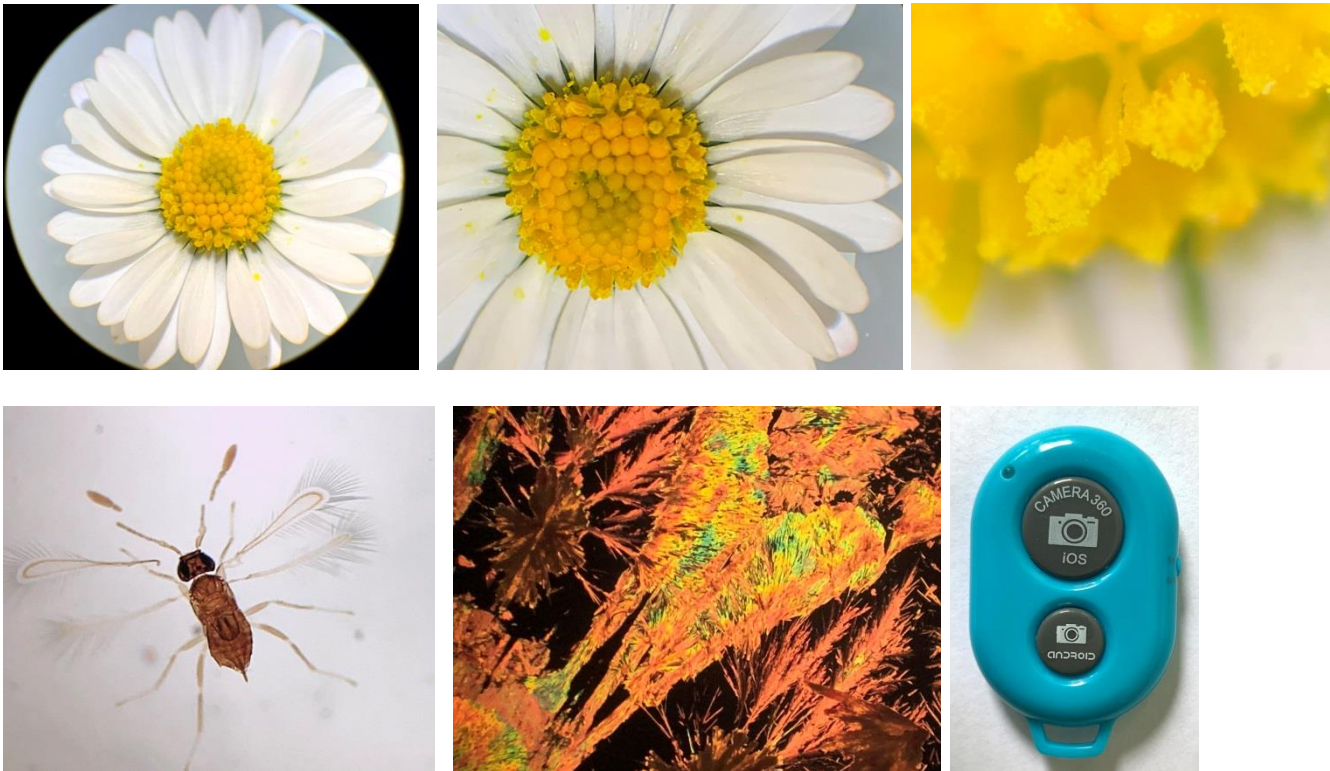
Whilst I was researching these adapters a week or so ago it seemed from reviews that most of the cheaper ones (£8-£15) only had a single screw clamp to position the phone accurately and were just as fiddly to get in the right place as holding a phone in position with blu-tak. The better ones (c£25) had an eyepiece tube fitted in but could cover only one size. Eventually I came across the one I will describe below which fits all sizes plus has 3 axes screw clamps and a mostly metal construction – you guessed, it is expensive, so I forked out £40 and it arrived an hour after I received James Battersby's draft MMS Newsletter to have a look through. As both he and I had whinged excessively about the lack of articles I was now feeling guilty that I would have to put into use this expensive accessory immediately AND write an article! A mere two hours later I had tried it out on two microscopes and a telescope and took the images shown here - so yes, it was easy to use and did the job required.

The adapter. I bought a **Celestron NexYZ Phone Scope Adapter**, from a reliable supplier of quality telescopes which arrived by next day delivery from Amazon. It immediately fitted the telescope and came with two sizes of rubber ring to insert in the clamp to fit the microscope eyepieces by tightening a metal screw thread. The three screws for positioning the phone camera centrally over the eyepiece and placing at the correct height were excellent and held things still.

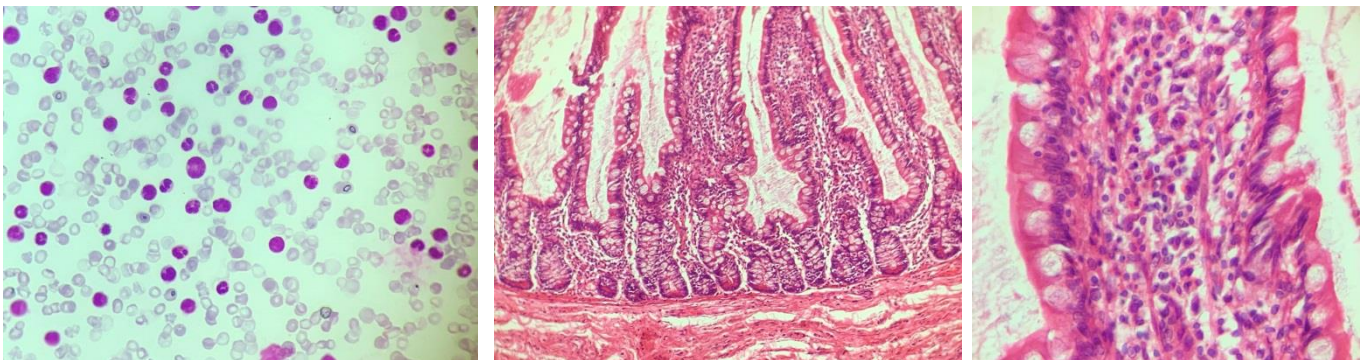


Mounted, front and rear views of adapter (first image copyright Celestron, all others Mike Mahon)

Results. Once positioned and microscope focused the circular field of view appeared live on the phone. This could then be spread to fill the screen using the usual finger-thumb spread apart gesture on the touchscreen. Overall I was very happy with the system and give some example images shown below, all taken during my initial two hour test. I didn't have time to set up any living/moving items under the microscope (I was doing all this whilst my wife was out on a 2 hour dog walk - currently known as daily exercise with social-distancing) so I recorded a quick movie clip of the seagull at the top of the telegraph pole through the telescope and was so pleased with the result I cannot wait to do some video microscopy.



Stereomicroscope images of Daisy, Fairy Fly and Magnesium Cyanide under crossed polars. Also, my remote Bluetooth camera shutter release (height 4cm).



Compound biological microscope images of blood (objective x40), small intestinal villi (x10,x40).

Problems. There were two slight problems. First, the weight of the phone and screw thread mechanism caused the phone to tilt from the horizontal and needed either a steady finger on one end or a fudged wedge or weight to keep the phone exactly parallel to the plane of the eyepiece/specimen. The second problem was due to my modern smartphone which has two cameras about a centimetre apart – one for magnifications from x1 up to x2 and the other for x2 to x10. So as soon as I got things setup and tried to expand the image beyond x2 the wrong camera was now in place over the eyepiece image! Eventually, however, I soon learnt to cope with this.

Another potential problem is shaking the phone when pressing the shutter since smartphones don't have cable releases. However this can be overcome by using the inbuilt timer. Even better and easier I found that my cheap (£3.60 to be precise) remote bluetooth shutter release came in really handy here for taking both stills and videos.



Seagull at the top of a telegraph pole.

Conclusion. So overall, I think good value for money, a precision and very adaptable instrument which should widen my scope (sorry about the pun) for instant imaging and videoing, let me annoy family and friends with what I have just been viewing, and encourage others to get involved in microscopy by taking their own images away with them. It is now nearly midnight on the same day (May 21st 2020) so I will stop here and send this off to the Editor otherwise you will never get your long awaited Newsletter!

Further Information. Searching Google and Amazon you will find lots of different adapters and a few reviews and You Tube videos of how to use them. In particular there are two excellent articles on the web:- www.microscopy-uk.org.uk by Mol Smith (2016), www.microbehunter.com (August 2019). Plus, as always, Peter Evennett has written several good articles on the physics/optics of using eyepieces for photomicrography.