

# MICROSCOPICAL EXPLORATION EIGHT

## AN UPGRADE ENABLING A FORAY INTO THE DARK (FIELD)

### and Observing on the Oblique (illumination)

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The two microscopes which I used for my previous Microscopical Investigations are both monocular. The Vickers M10A (July 1985) microscope, for example, which I have used for many years allows me to view my specimens **EITHER** with one eye only, using a standard eyepiece **OR** with both eyes, on screen and with smaller field of view, using my eyepiece camera. Also, it is not equipped with a swing-out filter holder, which limits my opportunity to explore different specimen illumination possibilities.

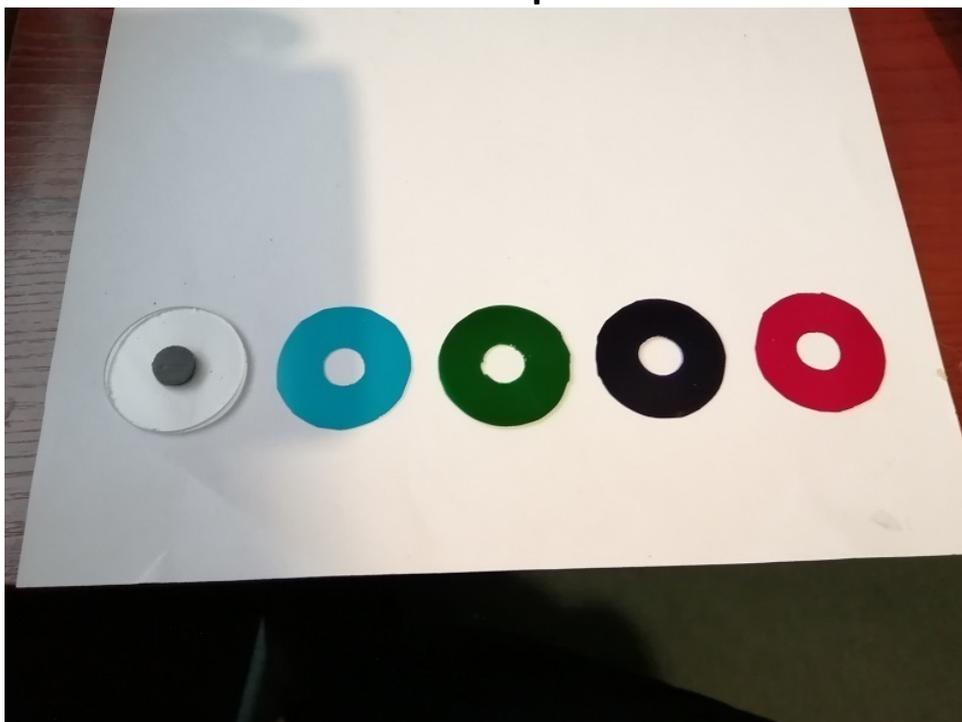
Now that we're into the third decade of the second millennium of the Common Era I realised that an upgrade would be a good idea. To that end I read many reviews and recommendations online and ended up using my limited PPPP (Poor Pauper Pensioner Pastime) budget to buy a trinocular microscope (see below) which allows me to observe with both eyes **AND** have my eyepiece camera attached for capturing images. Furthermore, the provision of a swing-out filter holder on the bottom of the condenser opens up the potential of dark field observation and also oblique illumination. These are techniques I have read about but never actually tried to use.

A rummage through my man-cave junk drawer, which is where items that may or may not become useful at some unspecified time are kept, threw up half a dozen 32mm diameter glass discs (5 blue and 1 colourless), some thin rubber sheet and a set of old cork borers. With guidance from the internet I used these items to construct a series of patch stops by cutting shapes out of the rubber sheet and sticking them to the glass discs. Trial and error revealed the optimal diameter for a circular dark field stop to be 8mm for the x4 objective and 10mm for the x10 objective of the new microscope. The other variously shaped patch stops for oblique illumination seem to work with both the x4 and x10 objectives. In addition, I cut some coloured annuli from old theatre lighting gels to fit around the 10mm dark field stop just to see what effect they would produce. All are pictured below.

Old Vickers monocular and new trinocular scopes



**10mm diameter dark field stop and coloured annuli**



**8mm diameter dark field stop and other variously shaped patch stops**



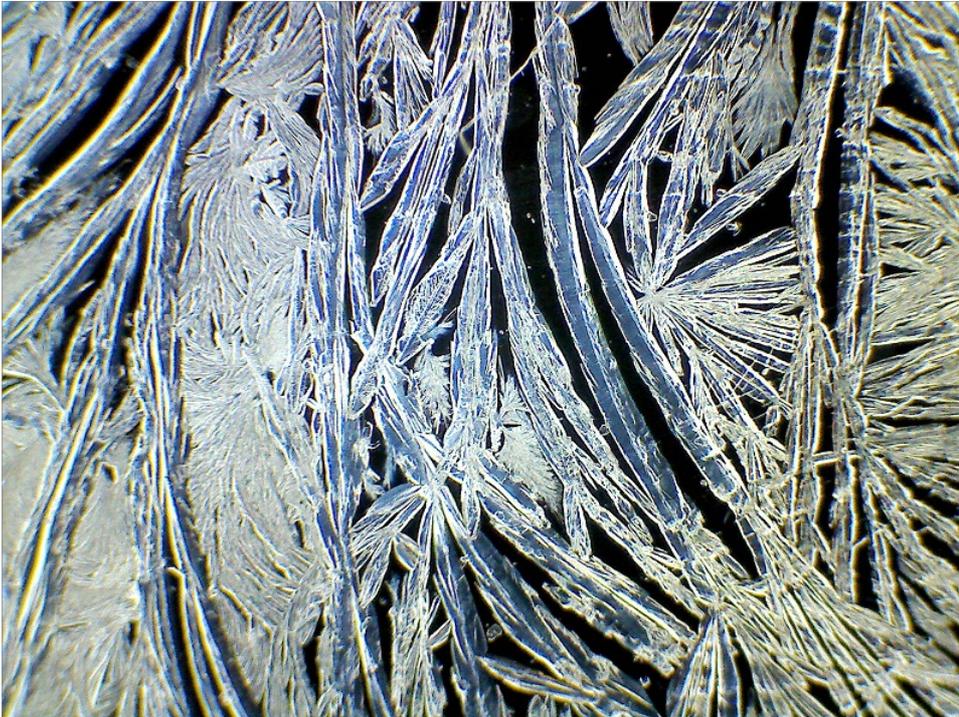
## **THE IMAGES**

The images below are of salicylic acid recrystallized from solution in Industrial methylated spirit.

### **X4 Objective/ Bright Field**



### **X4 Objective/ 8mm diameter Dark Field stop**



**X4 Objective/ Patch Stop 2**



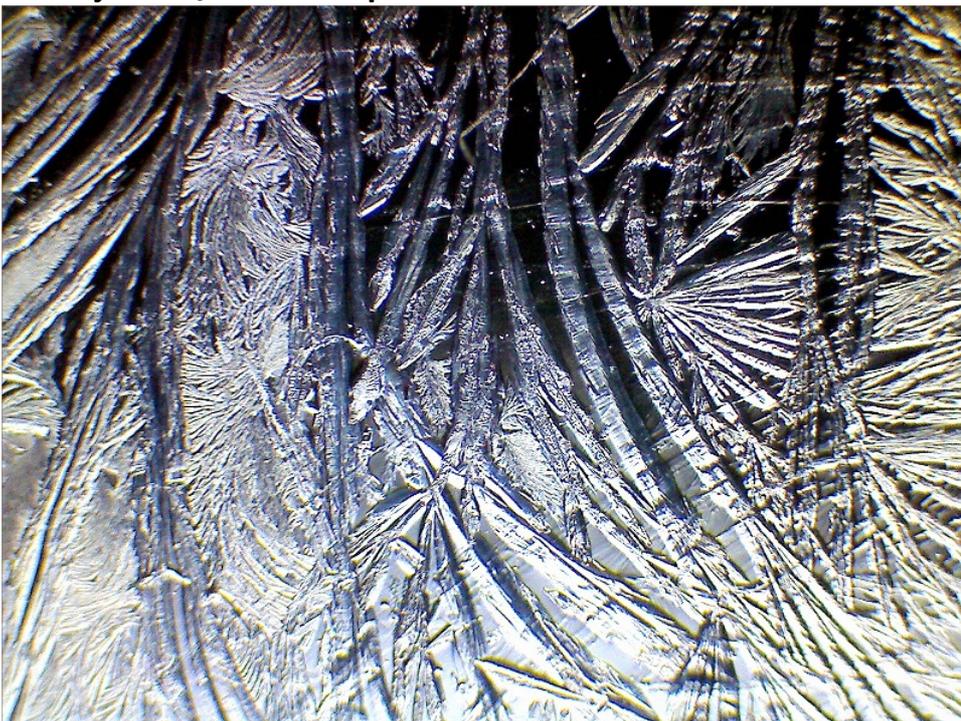
**X4 Objective/ Patch Stop 3**



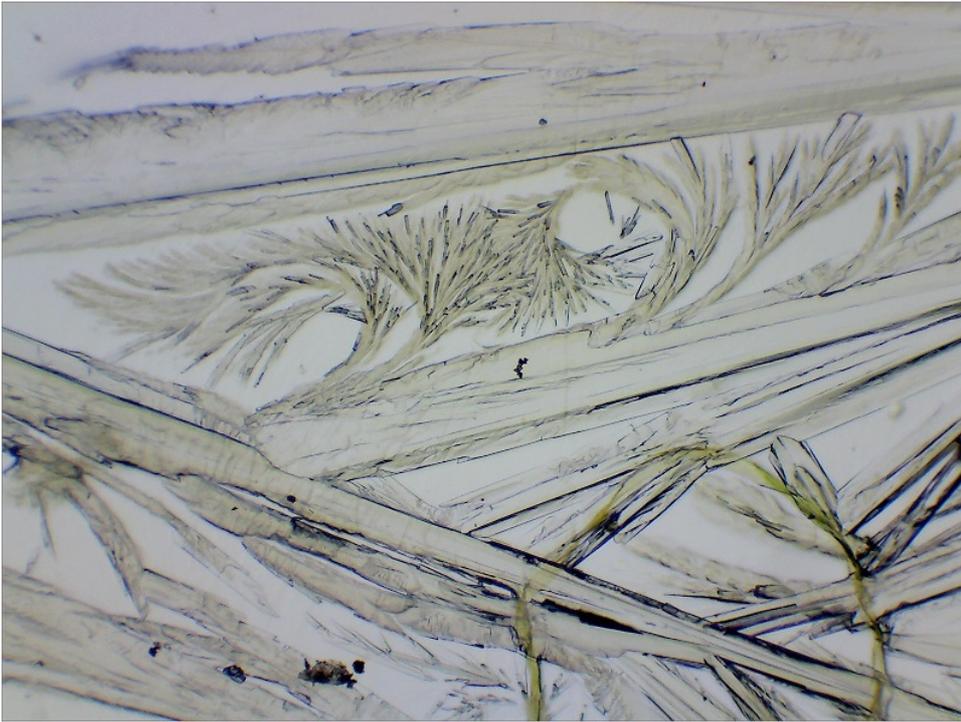
**X4 Objective/ Patch Stop 4**



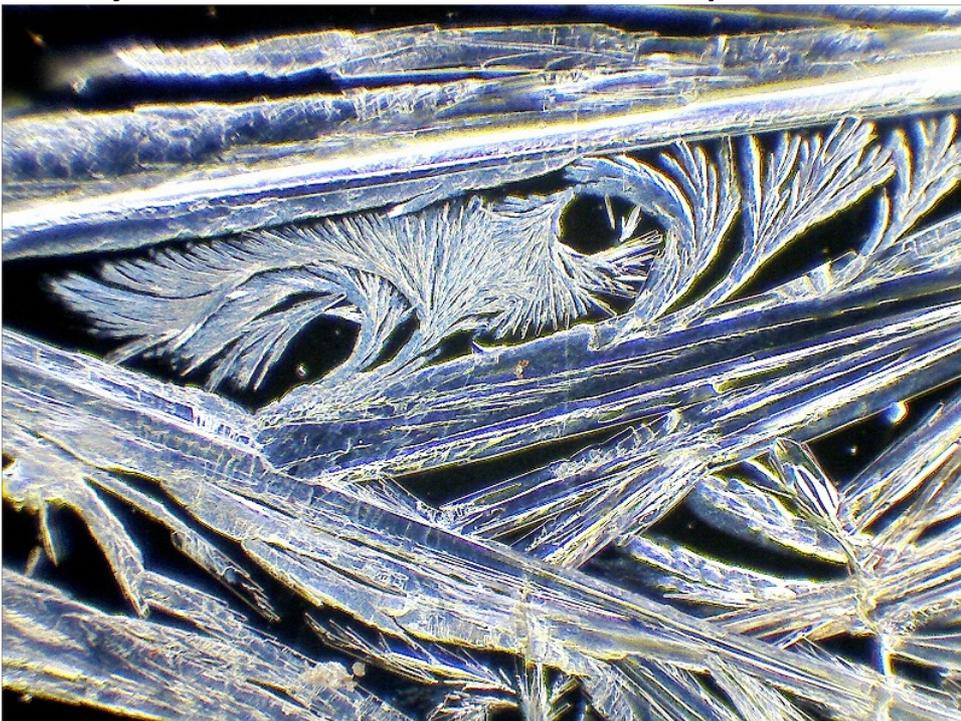
**X4 Objective/ Patch Stop 5**



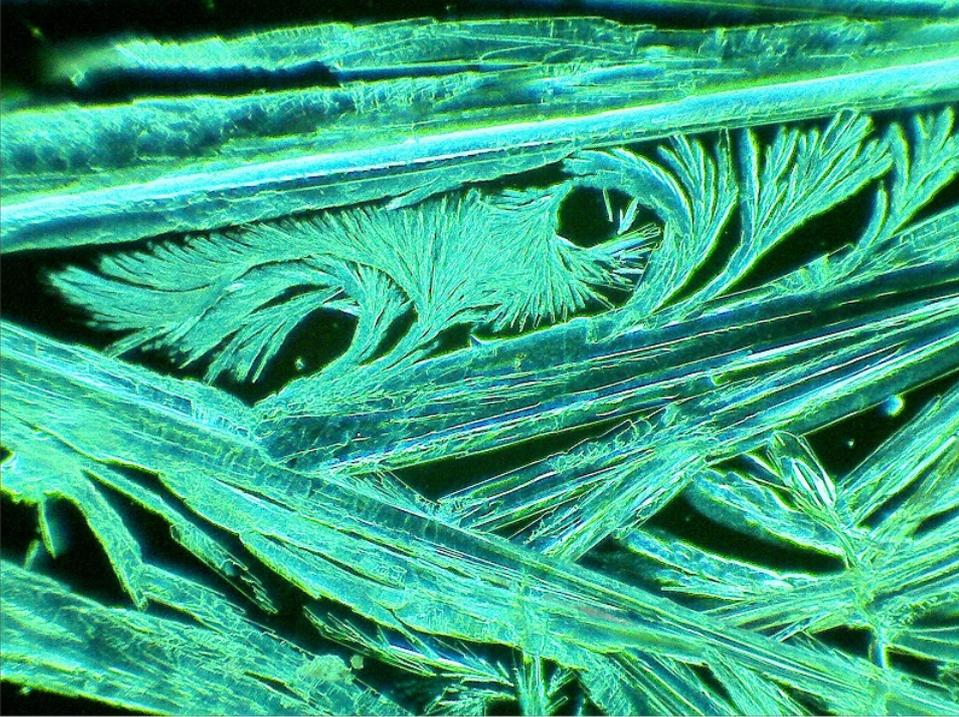
**X10 Objective/Bright Field**



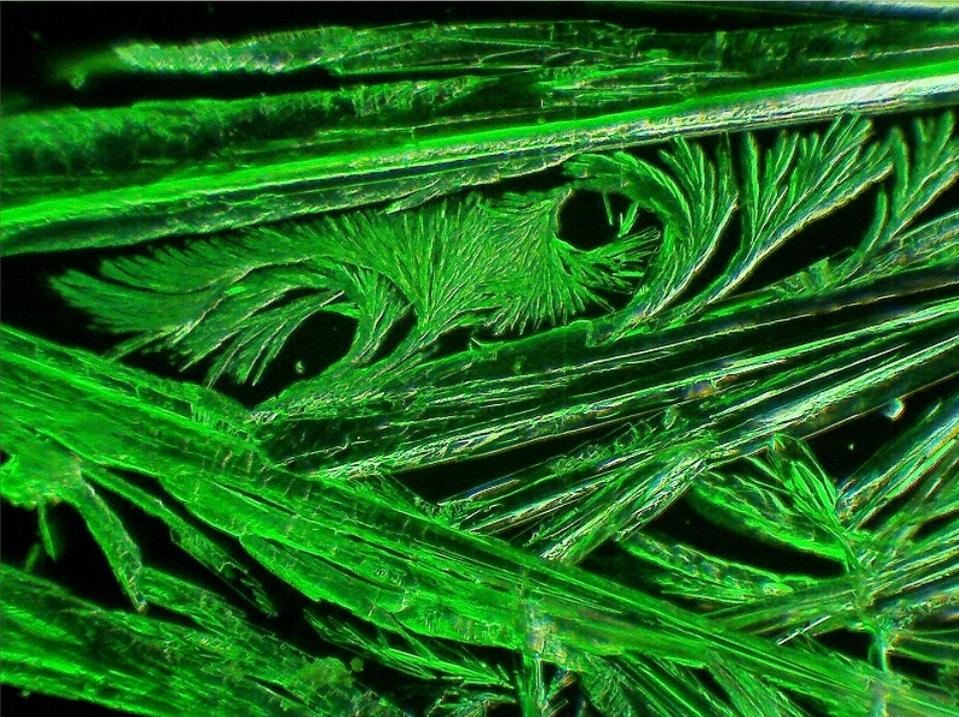
**X10 Objective/10mm diameter Dark Field Stop**



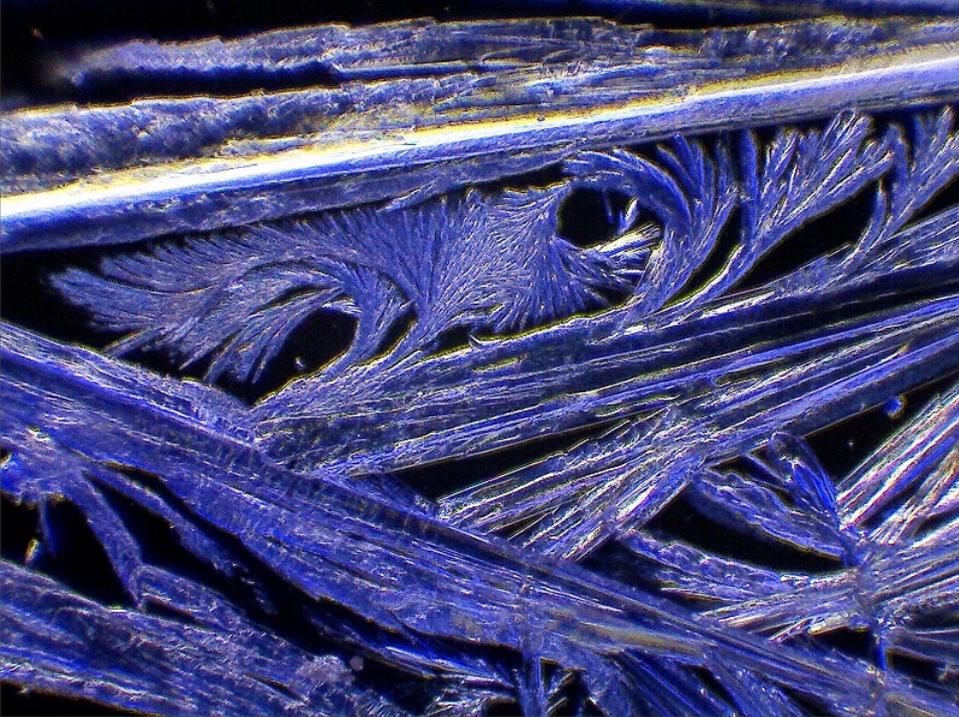
**X10 Objective/ 10mm diameter Dark Field Stop + Cyan Annulus**



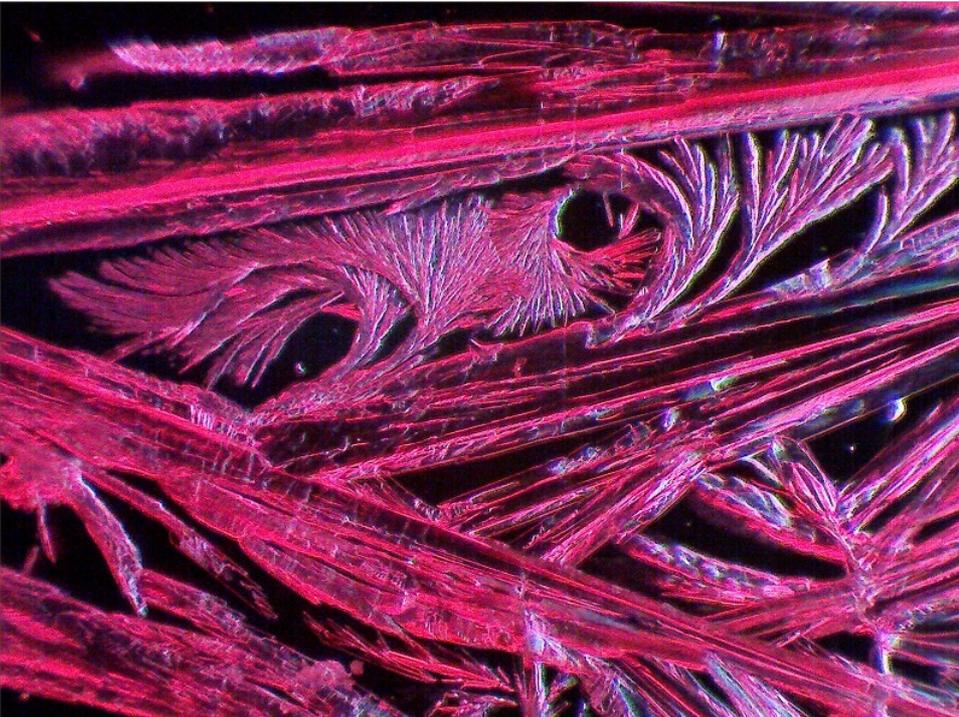
**X10 Objective/10mm diameter Dark Field Stop + Green Annulus**



**X10 Objective/ 10mm diameter Dark Field Stop + Indigo Annulus**



**X10 Objective/10mm diameter Dark Field Stop + Red Annulus**



## **IN CONCLUSION**

The organic crystals in my Microscopical Explorations are either white in colour or transparent and, as such, are difficult to see under the microscope using normal bright field illumination. Using the Dark Field or Oblique illumination, facilitated by the homemade patch stops in ME8, significantly more detail becomes visible in each of the images.

As always, interpret these images as you will, but as we say here in Cumbria:

**‘Ave a go yersel’!**

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