

# MICROSCOPICAL EXPLORATION

## TWENTY NINE

### COLD REMEDY (AN UPDATE FOR 2024)

It is now almost three and a half years since I began this series of 'Microscopical Explorations' (MEs), with a look at cold relief capsules crystallized from solution. <http://www.microscopy-uk.org.uk/mag/artjan20/js-cold-capsules.pdf> refers.

The cold relief capsules used back then contained Paracetamol, Phenylephrine hydrochloride and Caffeine at 300mg, 6.1mg and 25mg per capsule respectively, and were dissolved in Acetone free nail polish remover i.e. Ethyl acetate.

The microscope used was an old Vickers M10A dating from 1985 fitted with a Brunel Eyecam Plus 2MP eyepiece camera and homemade polariser and analyser filters. No attempt was made to define, in any way, the effect of the sticky tape waveplates used, which were constructed by the rather random application of unbranded sticky tape to glass microscope slides.

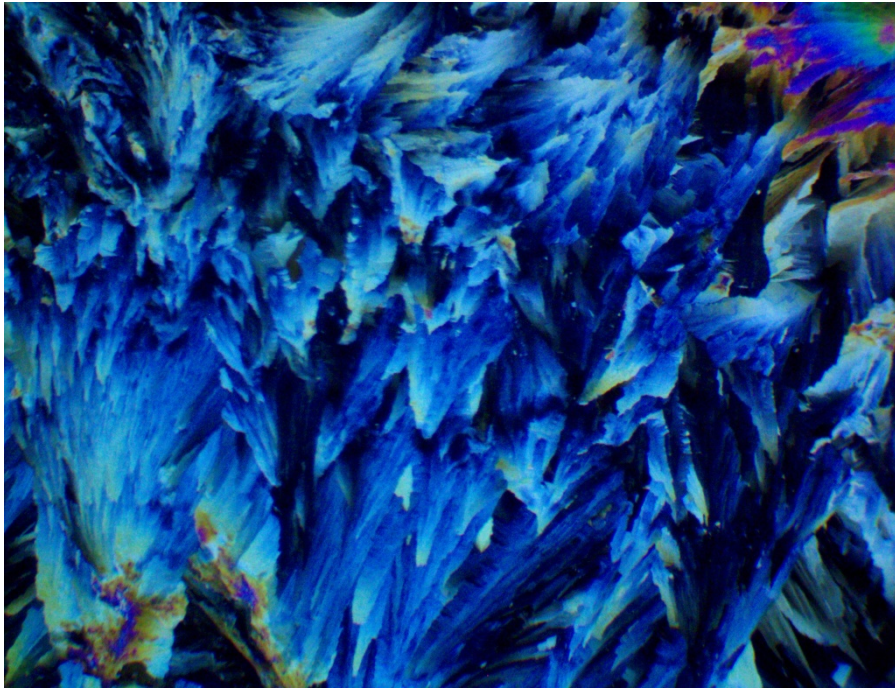
#### ME29

Now, in February 2024, I turn my attention towards a "**MAX STRENGTH ALL IN ONE**" cold and flu relief capsule from the pharmaceutical company bearing the name of a famous British music conductor of the early to mid-twentieth century...you know the one... (Sir Thomas Beecham). Each of these capsules contains Paracetamol, Phenylephrine hydrochloride and Guaifenesin, at 500mg, 6.1mg and 100mg respectively, but no Caffeine, and was also dissolved in Acetone free nail polish remover.

This time, the microscope was a modern Swift SW380T trinocular fitted with a SWIFTCAM SC1003 10MP camera and the same homemade polarising/analysing filter combination. A set of four sticky tape waveplates was made, each of the four defined by the background colour observed when it was interposed between the polariser and analyser with no specimen in place. These colours were: Magenta, Cyan, Yellow and White, and they were designated M, C, Y, and W respectively.

A specimen slide was prepared by pipetting 200 $\mu$ L of the Max Strength capsule solution onto a clean glass microscope slide and allowing it to evaporate at room temperature. The slide was observed, firstly, between crossed polars alone, and subsequently with each of the sticky tape waveplates, in turn, inserted between polariser and specimen slide. The following images were captured:

**Max Strength Capsule - no Waveplate**



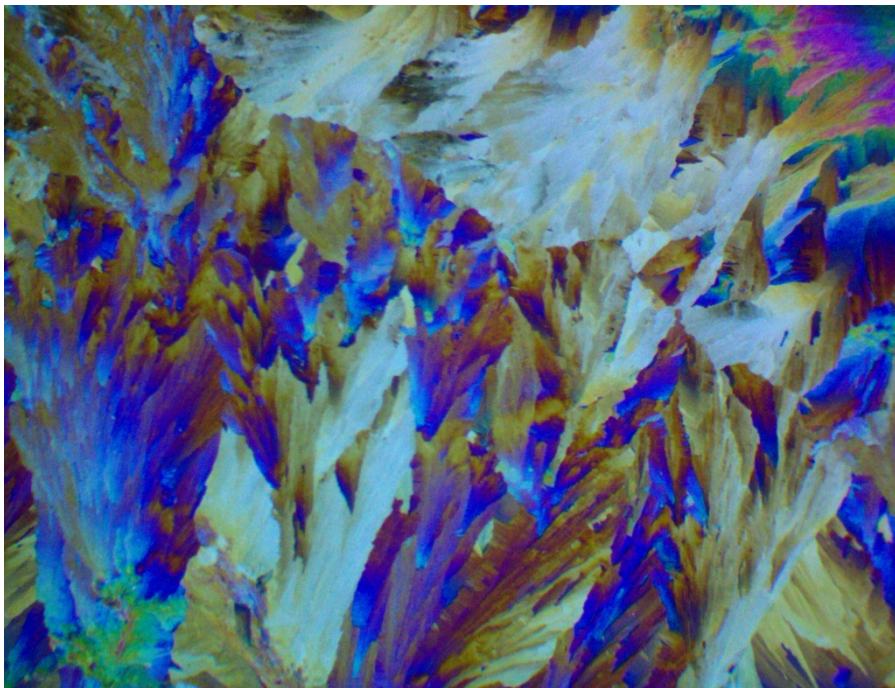
**Max Strength Capsule – Waveplate M**



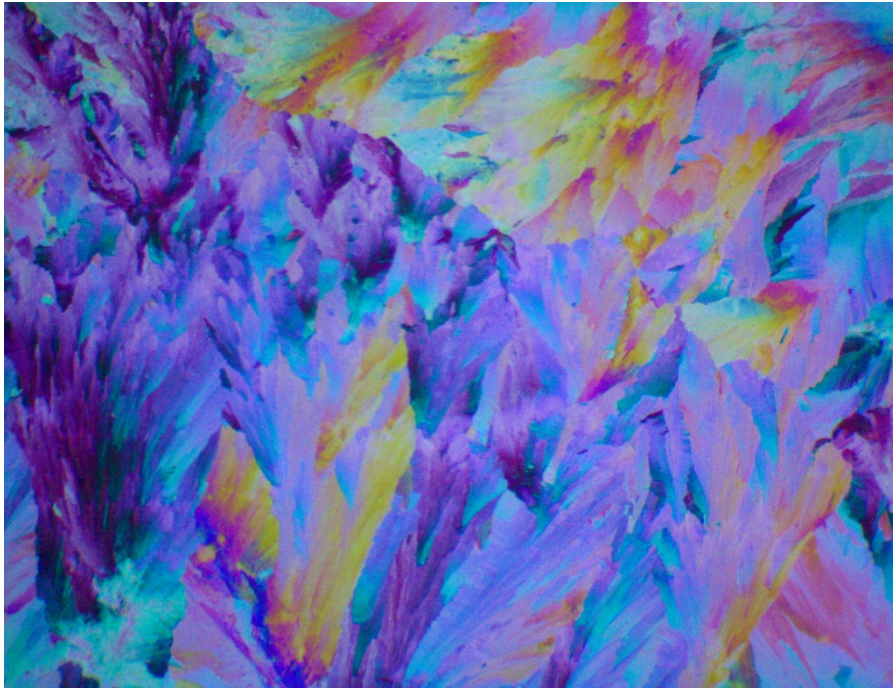
**Max Strength Capsule – Waveplate C**



**Max Strength Capsule – Waveplate Y**

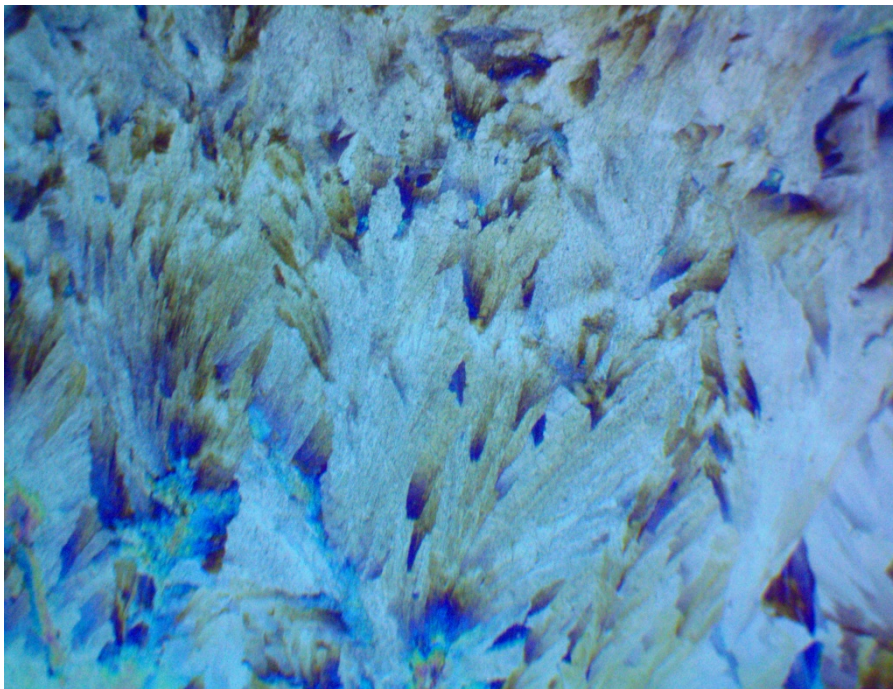


### Max Strength Capsule – Waveplate W

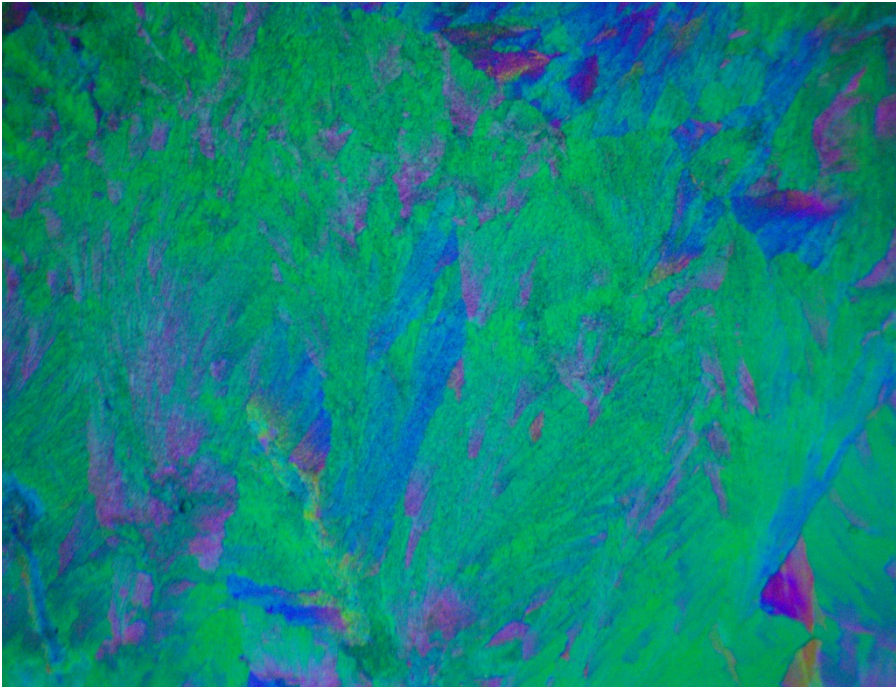


Next, the polarising filter was rotated 90° clockwise which moved it into parallel configuration with the analysing filter, and the observations, as above, were repeated, and the following images were captured:

### Max Strength Capsule – no Waveplate



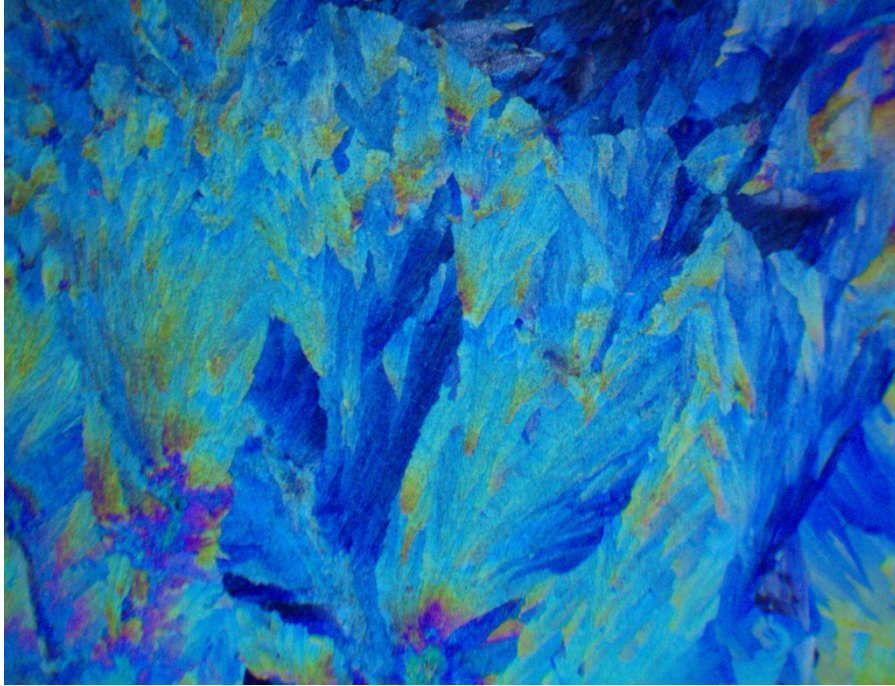
**Max Strength Capsule – Waveplate M**



**Max Strength Capsule – Waveplate C**



### Max Strength Capsule – Waveplate Y



### Max Strength Capsule – Waveplate W



As I have written previously:

There are almost limitless variations in colour and pattern resulting from the simple microscopical procedure detailed above, which is also applicable to many other toiletries, cosmetics and pharmaceuticals.

**As we say here in Cumbria:**

**'Ave a go yersel'!**

**Comments, gratefully received, to:**

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