

MICROSCOPICAL EXPLORATION FOURTEEN

A Closer look at Blood, Fish and Bone

PART 1

Blood Fish and Bone is a balanced organically based plant fertiliser in powder form. It is rich in various chemical compounds of Nitrogen, Phosphorus and Potassium, and is used both as a fertiliser for growing plants and as a soil improver prior to planting. It also happens to be an interesting subject for microscopical observation.

To that end a few grams of blood, fish and bone powder were put into a small plastic Petri dish and placed on the stage of my stereomicroscope. The microscope is fitted with an eyepiece camera, and the first four images below are of the fertiliser as it comes out of the box. All the images were captured by a Brunel Eyecam Plus at 1600 x 1200pixels and using the x2 objective pair of an Apex Discovery stereomicroscope.

Image 1

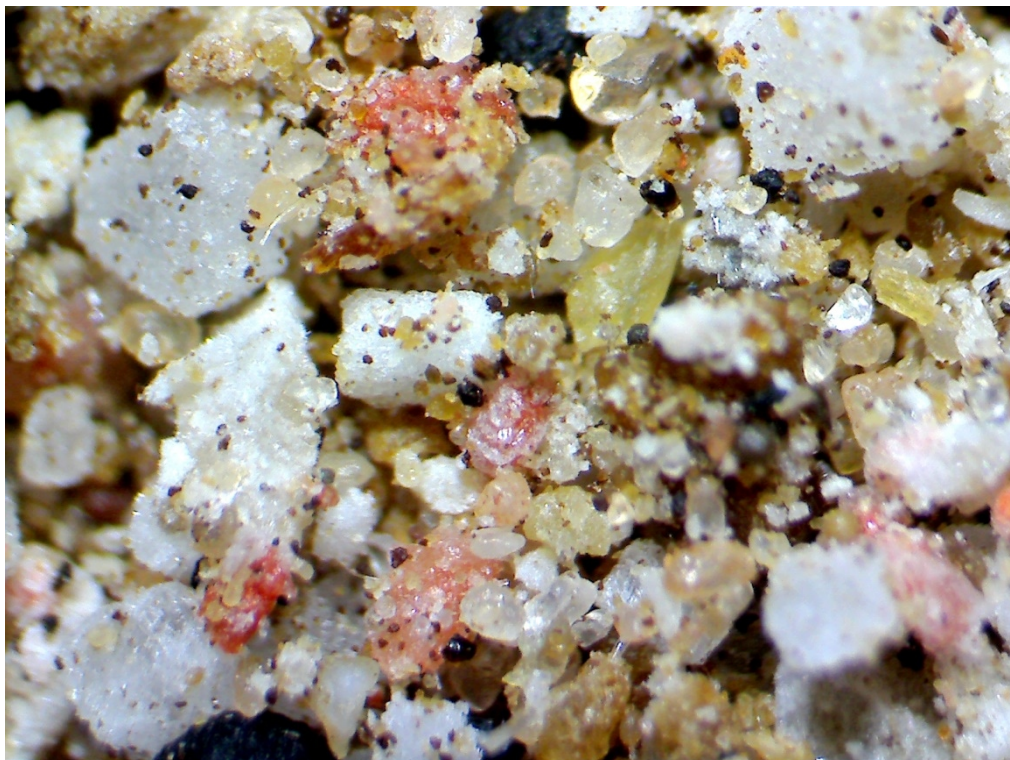


Image 2

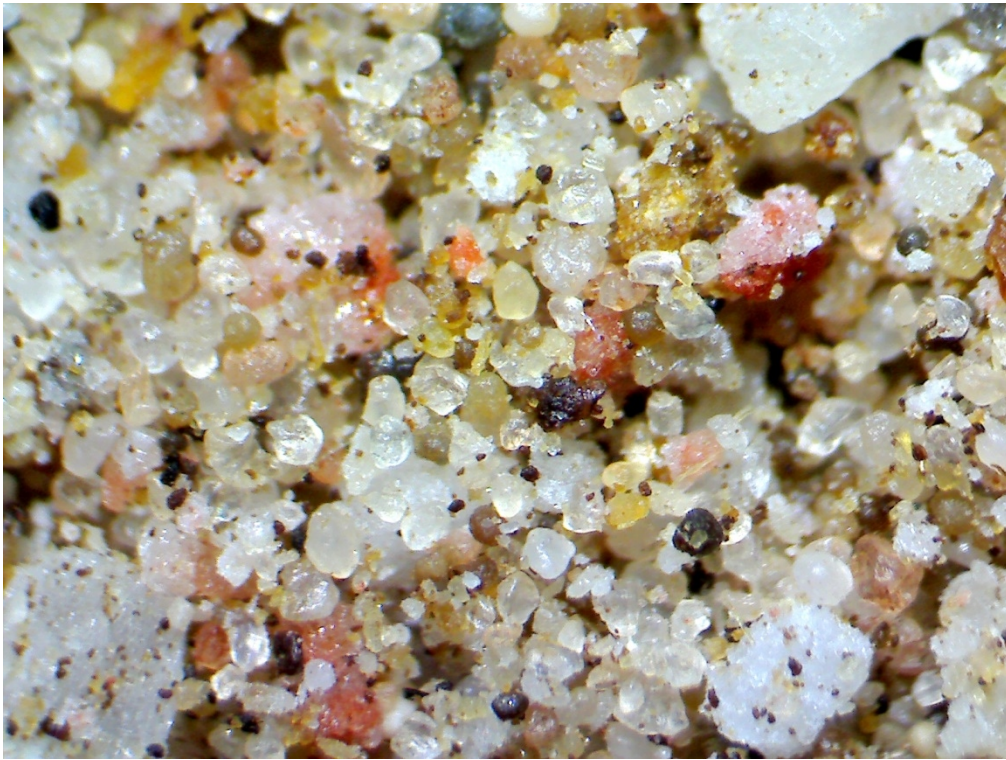


Image 3

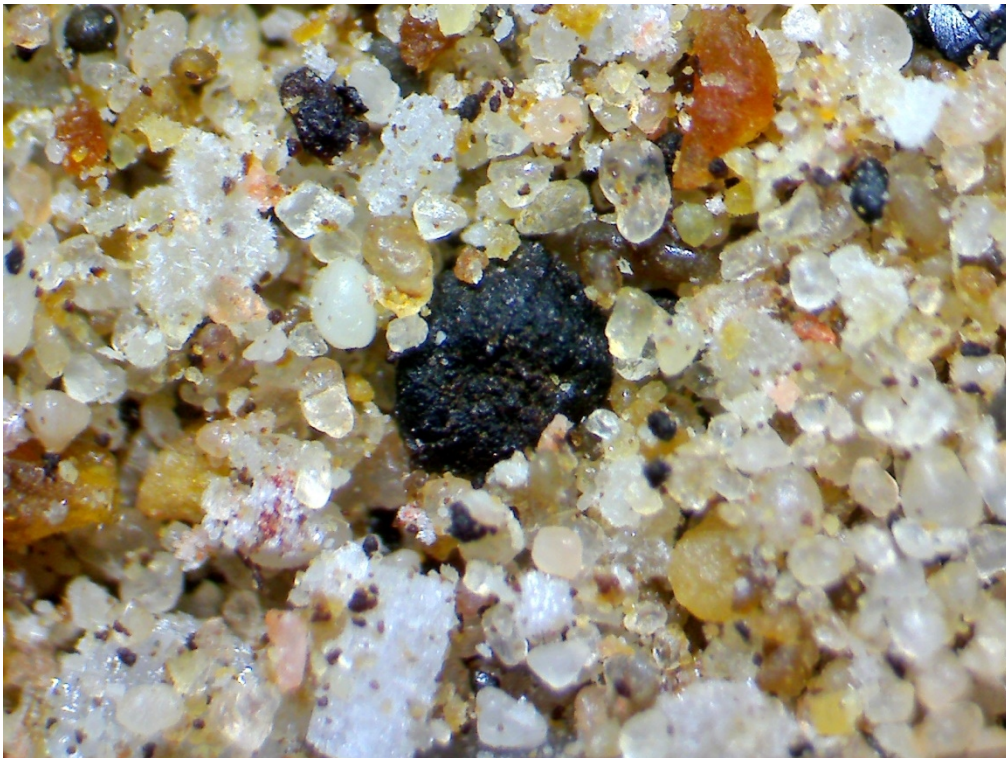


Image 4



PART 2

To be beneficial to plants, the nutrients in blood, fish and bone must be water soluble. So, the next stage of this microscopical exploration involved isolating the water soluble components of the blood, fish and bone by leaching with warm water. The leachate was collected and a few drops were allowed to crystallize on a clean microscope slide, and the images below were captured

Image 5 Leachate crystals under transmitted illumination

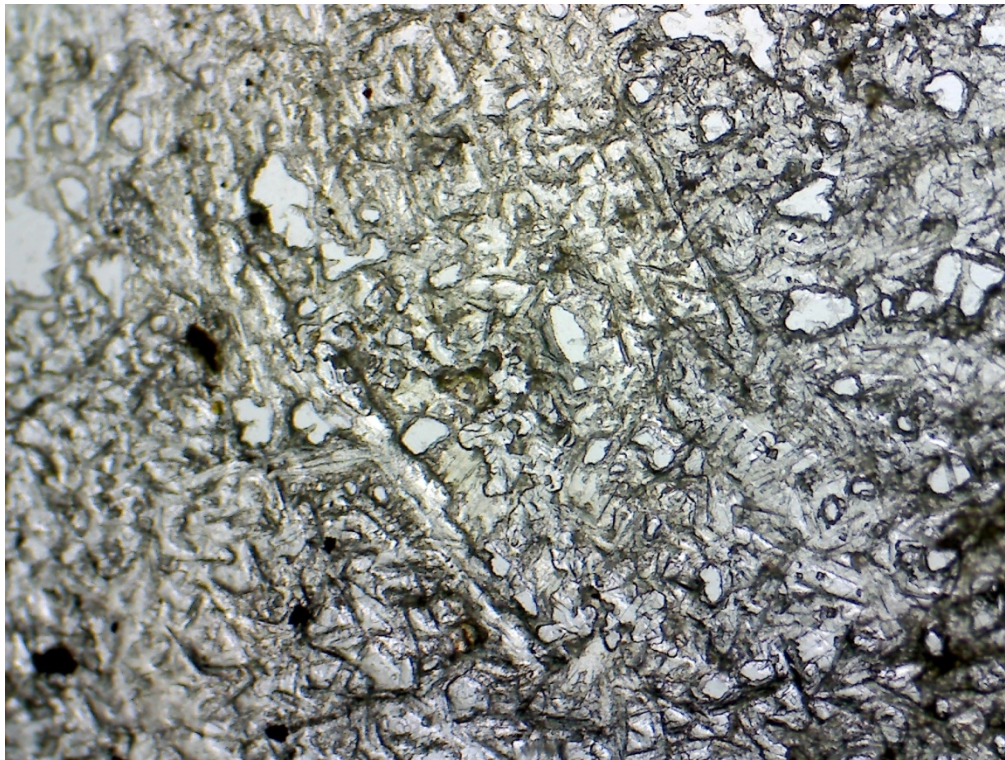


Image 6 Leachate crystals under incident illumination



Image 7 Leachate crystals under dark field illumination

This image required the use of a special dark field attachment for the stereomicroscope.

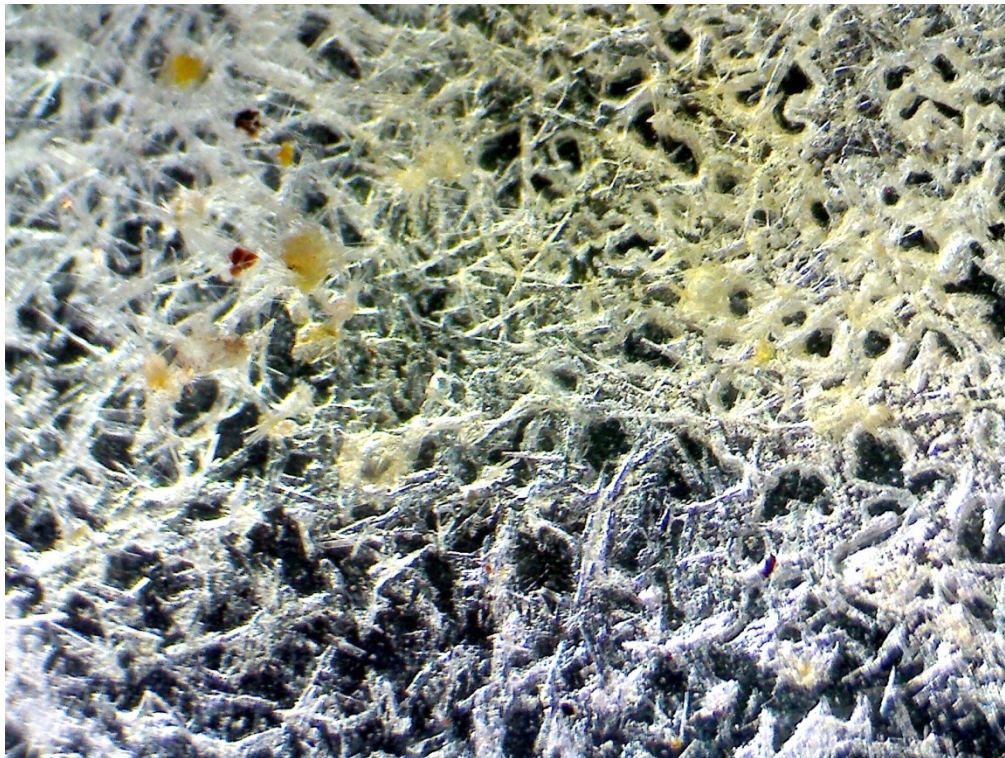
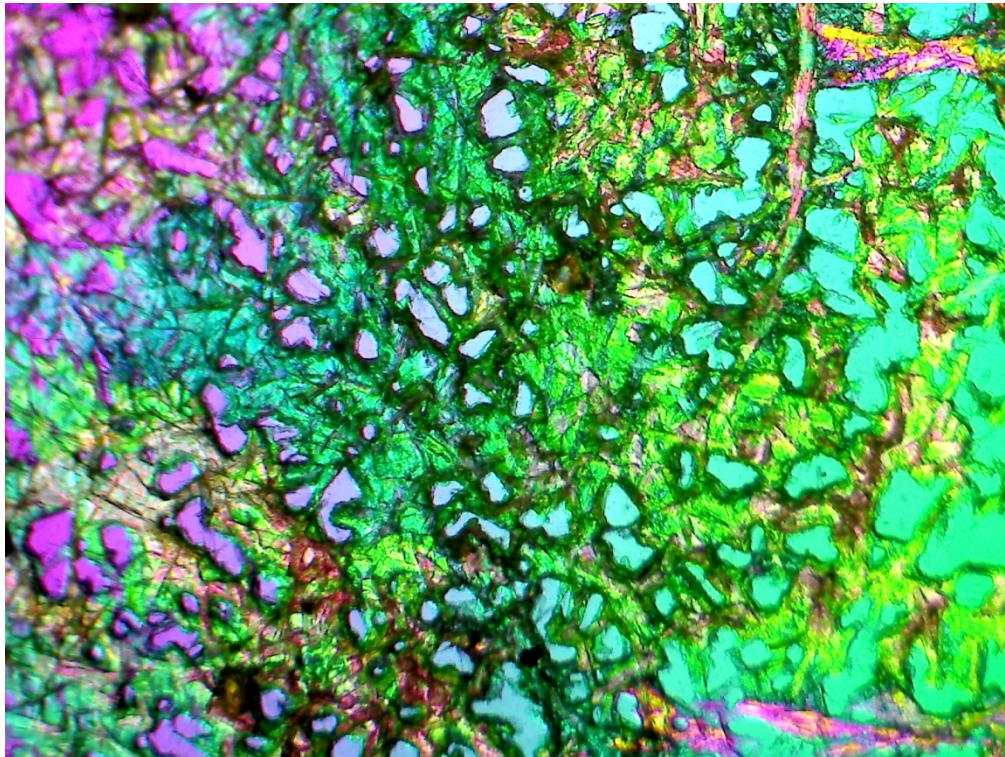


Image 8 Leachate crystals under transmitted illumination with crossed polars.

This image required the use of polariser and analyser filters on the stereomicroscope



PART 3

The removal of the water soluble components of the blood, fish and bone by dissolution in the warm water leach left the insoluble components as a solid residue which was subsequently air dried. This residue was observed at the same magnification as used above and Image 9 below was captured. For comparison, Image 10 is of washed sharp sand, also known as builders sand, captured at the same magnification as Image 9.

Image 9 Insoluble residue



Image 10 Sharp (builders) Sand



The grains of sand (SiO₂) in Image 10, although somewhat larger, do bear a striking resemblance to the residue grains in Image 9.

Here, dear Reader, I leave you to draw your own conclusions.

As we say here in Cumbria:

‘Ave a go yersel’!

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