

## Merehead Mineralogy – An Update

This short article is intended to provide members with updated information (as of December 2006) related to the ongoing work on the mineralogy of the Merehead manganese deposits.

A number of rare silicate minerals have been found at, or re-confirmed from Merehead:

- Ardennite is reconfirmed as genuine – we have located the original specimens at the NHM and verified their identity. Ardennite is however associated with the late stage hydrothermal event, and not with the manganese pods.
- Kentrolite is turning out to be one of the exceptional Merehead species. It has turned up twice in the manganese pods found on the Society trips in July 2005 and June 2006 (so if you were on those trips, you probably have some). There are two new modes of occurrence for this species. The first mode is tiny radiating rosettes of brownish material apparently replacing bladed crednerite, from the pod dug out last June. The second mode is much more interesting – kentrolite occurs as large, euhedral crystals up to perhaps 5mm in cavities and also as crystals embedded in the calcite/cerussite infill. In the pods referred to, kentrolite looks \*exactly\* like goethite, and we suspect that it is actually rather common, and simply misidentified. Neil Hubbard, MR and RT, all realised at about the same time that it was something odd, and checked it out, and all came up with the same result. So, take a look at any specimens that you have from those trips.
- Melanotekite has been re-found by MR and RT. It occurs as coatings and small granular masses of a distinctive yellowish-green colour in the iron rich outer parts of the same two pods. Although closely related to kentrolite, the melanotekite is associated with quartz and clearly a result of silicification of the outer layers of the manganese pods by the late stage hydrothermal event. An old #2 vein specimen labelled as 'vésiginéite' is visually identical and has turned out to be melanotekite too. We therefore suspect that vésiginéite does not actually occur at Merehead. Other specimens are currently undergoing analysis to confirm or dismiss this conjecture.
- Nasonite can be reconfirmed as occurring at Merehead. MR has located a second specimen in old material within the NHM collections associated with apophyllite, datolite, baryte and goethite. Like ardennite, nasonite is associated with the late stage hydrothermal event and not with the manganese pods. EDS analysis of this new specimen has conclusively confirmed the identity of this phase as nasonite and not ganomalite. Ganomalite does not occur at Merehead and should therefore be removed from any records or references that you have.

There has been considerable misinformation in the past around the occurrence of ardennite, ganomalite, kentrolite, and vésiginéite, so we hope that this will clear up any possible confusion.

We have identified a number of previously unrecorded species at Merehead. The list includes alumohydrocalcite, chrysocolla, cotunnite, dundasite, and saponite.

We have verified that vanadinite does occur at Merehead, but it is nothing to get excited about from a collecting perspective – the only valid occurrences are some minute (~20 micron) sized spots in vanadium rich mimetite from the old #2 vein which happen to have  $V > As$ , and which are therefore technically vanadinite. To date, we've not found any vanadinite crystals (even the orange and red crystals are still mimetite). We've noticed that every vanadium-rich mimetite crystal that we have seen occurs in, or immediately adjacent to the manganese oxides. Those crystals 'further in' toward the centre of a cavity contain little or no vanadium. This reflects the source of the vanadium being the manganese oxides (see the last paragraph of this update).

We have put images and more information on all these species up on the Mindat website

<http://www.mindat.org/loc.php?loc=1618>

RT and MR are systematically working through the mineralogy of all the Mendip manganese deposits, with the aim of producing a treatise in due course. We started out with the intent of producing an article, but it has of necessity grown and is now so large that it's likely to end up as a book!

Rick Turner & Mike Rumsey  
(December 2006)

Last but not least, it has only taken me forty years to see the obvious, but I have “finally” worked out how the Merehead manganese deposits were formed. The details are reasonably complicated, but in a nutshell, it's due to alteration of galena by seawater. The theory accounts for all the observed features – geology, structure, geochemistry, and mineralogy (including the oxychlorides, arsenates, heavy metal secondary minerals, and the manganese oxides themselves). I've written this up formally and submitted it for publication in *Mineralogical Magazine*.

Rick Turner  
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