REPORT

Bobkingite – the untold story

It is not often that a new mineral is discovered, anywhere in the world. This is an account of how it happened on our doorstep, and how the persistence of its discoverer, Neil Hubbard, finally paid off.

Our story begins in August 1993, in Charnwood Forest. Neil Hubbard was walking round the newly created footpath at the base of a man-made hill that was part of the screening to the New Cliffe Hill Quarry. Judging by all the debris, this hill evidently contained many tonnes of interesting copper mineralisation, and in a nearby drainage ditch was a lump of cuprite and malachite, about the size of a house brick but broken in two. Within the cuprite were tiny sprays of dark blue connellite, a complex chloride and sulphate of copper. This was sufficient to warrant collection and within a few days Neil had carried out a microscope study, by carefully breaking down one of the samples. Not much was found at this stage, but in the spring of 1994 the second piece was examined.

Again, very little was found and it was not until the last small fragment was investigated that the real discovery was made. The fragment was broken down into four pieces, each smaller than a thumbnail, and on investigating the first of these by microscope, a pale blue platy mineral, in crystals less than 1 mm across, became immediately apparent. The same mineral appeared in each of the other three pieces and on checking various reference books, the closest comparison seemed to be with claringbullite, a very rare, pale blue, platy copper chloride that occurs with connellite in cuprite. As claringbullite had not previously been found in the UK, such a potential identification was obviously of major importance, so Neil decided to seek confirmation by sending a piece for X-ray analysis at the Department of Mineralogy of the Natural History Museum in London.

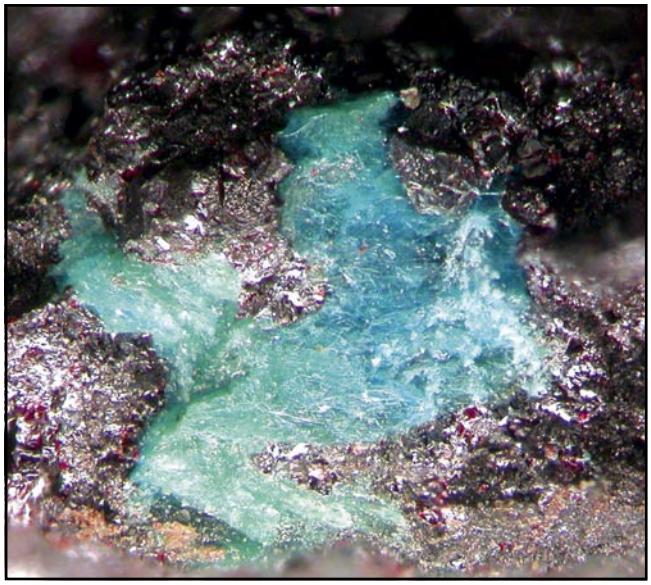
Here commences the next part of the saga. A couple of months later, Neil received a letter from the museum saying only: "pale blue platy crystals, New Cliffe Hill Quarry, Leics. X-ray 9833F = unknown (good pattern)" and asking if there was any more sample to probe, in order to obtain a qualitative analysis. A second sample was sent to the museum, which duly reported back within a couple of weeks confirming that the mineral was indeed a copper chloride. As there was not enough of it to do any further work, however, they asked to keep the two samples in case more of it became available later. Neil was now left with only two tiny specimens of a probably rare, but as yet unidentified, mineral.

The big break came in the February of 1999, when Neil attended the largest mineral, fossil and gem show in the world at Tucson, Arizona. There he met Frank Hawthorne of the University of Manitoba, but a native of Somerset and probably the world leader in determining the crystal structures of minerals. Frank happened to be working on the structures of copper chloride minerals and was keen to see the samples from Cliffe Hill. Unfortunately, the Natural History Museum did not reply to Neil's request for their return, so the two remaining samples - possibly the last in the world - were sent off to Canada.

The gamble paid off in July of 1999, when Frank reported that this was a new mineral, and provided the details of its chemical formula and crystal system. Neil decided to name the mineral 'bobkingite' after Dr R J King, formerly of the geology department of Leicester University, founder of the Russell Society and the person who has perhaps done more than anyone else to promote the mineralogy of Leicestershire.

All that remained to do was to write a short account of the geology and minerals of New Cliffe Hill Quarry, which was added to the formal description of the mineral. A paper describing the discovery subsequently appeared in the Mineralogical Magazine of April 2002, Vol. 66, pp. 301-311, written by F C Hawthorne, M A Cooper, J D Grice, A C Roberts and N Hubbard; its title was: "Description and crystal structure of bobkingite, $Cu^{2+}_5Cl_2(OH)_8(H_2O)_2$, a new mineral from New Cliffe Hill Quarry, Stanton-under-Bardon, Leicestershire, UK".

John Carney



Bobkingite is characteristically pale blue but parts of it are a pale green in this specimen that is just 1.5 mm across (photo: David Green, Manchester Museum).