

## GeoSuffolk Notes 49

### Copper and Copper Minerals

- A demonstration for National Science Week 2014.
- At Ipswich Museum, 22 March 2014
- Mineral specimens from Ipswich Museum
- Other specimens and labels by GeoSuffolk
- Except for 'Please do not touch' these are the labels for the day.

#### Native Copper

Pure copper is usually tarnished and dull. It sometimes contains a little silver. This specimen is from Cornwall.

#### Cuprite

A copper oxide, containing 88.8% copper. With a reddish colour, the crystals have a refractive index higher than that of diamond, giving them a brilliant appearance. This specimen is from Cornwall.

#### Tile Ore

A reddish-brown earthy variety of Cuprite, generally containing iron oxide. This specimen is from Wheal Unity, St Day, Cornwall.

#### Chalcotrichite

A variety of Cuprite having delicate, elongated, interlacing crystals of a brilliant red colour. This specimen is from Cornwall.

#### Melaconite

A black earthy variety of Tenorite, a copper oxide. This specimen is from Goonhilly Copper Mine, Lizard, Cornwall.

#### Malachite

A copper carbonate, containing 57.3-4% copper. An important ore of copper, it is the most stable compound of copper at the earth's surface. The thin green encrusting patina on ancient bronze remains consists principally of malachite. Also in the past, malachite was crushed and used as a pigment ('mountain green'). Original locality of this specimen is not known.

#### Malachite

Usually found as globular masses, commonly with a smooth, rounded external surface. This specimen is from Burra Burra Mine in South Australia.

#### Malachite

Broken surfaces of this bright green mineral show that successive layers are often alternately lighter or darker in colour. Good quality material may be cut and polished for ornamental purposes. This specimen is from Nkana Mine, Zambia.

#### Malachite

Small crystals may form fibrous aggregates often with a distinctly silky lustre. This specimen is from Bannatt in the Moldavian region of Eastern Europe.

Malachite  
From Zambia

Azurite

A copper carbonate, named after its azure-blue colour. It is also known as Chessylite, taking that name from its occurrence at Chessy, near Lyons in France. In the past it was powdered to use as a pigment ('mountain blue'), but because it slowly alters to malachite, blue sky in paintings alters to green! This specimen is from Cyprus. The name 'copper' is derived from the Latin 'Cuprum' – the Roman name of Cyprus.

Chrysocolla

A copper silicate. Impure specimens are sometimes sufficiently hard to be cut and polished for jewellery. This specimen is from Cornwall.

Atacamite

A copper chloride, containing 59.4-5% copper. Takes its name from its occurrence in the desert of Atacama in northern Chile. In the past in Chile it was ground to a sand and sold under the name 'arsenillo' for use as a blotting agent. This specimen is from Chile.

Elsewhere this mineral is used by a blood-worm to bite and inject venom.

Atacamite

This specimen is from the Burra copper mines, north of Adelaide in South Australia. The mineral was discovered there in 1845 and large amounts were mined until the exhaustion of the deposit in 1877. This specimen was donated to Ipswich Museum by the Rev. Daniel Greatorex (1829-1901), East End social reformer and local philanthropist, of St Paul's Church, Dock Street, London Docks. He was also a keen traveller, including visiting Australia.

Chalcanthite

A copper sulphate, also called 'blue vitriol'. It is soluble in water, and a drop of the solution placed on the surface of iron coats it with metallic copper. This specimen is from the 1813 eruption of Vesuvius.

Chalcopyrite

A sulphide of copper and iron, also called 'copper pyrites'. It is the principle commercial ore of copper, and has a characteristic brass-yellow colour. This specimen is from Kroom Hill, Queensland, Australia.

Extracting copper from Chalcopyrite

The chalcopyrite is first heated to form copper sulphide and iron oxide. This is then heated with limestone and sand which separates the sulphide. The sulphide is then heated and blown with air which converts it to copper metal.

Chalcopyrite

This mineral frequently has a tarnish on the surface; when brilliantly coloured it is sometimes called 'peacock copper-ore'. This specimen is from Mexico.

Chalcopyrite

This is 'blister copper ore' a botryoidal variety of chalcopyrite. The original locality of this specimen is not known.

### Chalcosite

A copper sulphide, also called 'copper glance'. An important ore of copper, containing 79.8% copper. This specimen is from Geevor Mine, Pendeen, Cornwall. Chalcocite was formerly abundant at Redruth in Cornwall and was sometimes known as 'redruthite'.

### Bornite

A sulphide of copper and iron, also known as 'variegated copper ore' (because it often displays a coloured tarnish) and as Erubescite. This specimen is from Sudbury, Ontario, Canada. Bornite is named after the mineralogist Ignatius von Born (1742-1791).

### Tetrahedrite

A sulphide of copper and antimony; part of the copper is often replaced by iron, zinc, silver or mercury. Also known as 'grey copper ore'. This specimen is from Peru.

### Tennantite

A sulphide of copper and arsenic, named after Smithson Tennant (1761-1815), Professor of Chemistry at Cambridge. This specimen is from Blue Jacket Mine, Zambia.

### Enargite

A sulphide of copper and arsenic. This specimen is from Cornwall.

### Olivenite

Copper arsenate - the name olivenite alludes to the olive-green colour. This specimen is from Cornwall.

### Liroconite

An arsenate of copper and aluminium. This specimen is from Cornwall.

### Libethenite

A copper phosphate. This specimen is from Old Gunnislake Mine, Gunnislake, Cornwall.

### Chalcosiderite

A phosphate of copper and iron; this specimen is from Cornwall.

### Chalcophyllite

A copper arsenate; this specimen is from Wheal Unity, St Day, Cornwall.

### Chenevixite

An arsenate of copper and iron, this specimen is from Wheal Unity, St Day, Cornwall. It may contain Olivenite.

### Covellite

A copper sulphide, often known as 'indigo-copper' on account of its colour. Covellite is named after the mineralogist N Covelli who detected small crystals of this mineral in Vesuvian lava in 1839. This specimen is from the Vesuvius eruption of 1944.

### Powder for Bronze

Powder of 90% copper and 10% tin, which forms Bronze when alloyed. As used by the Manganese-Bronze company in Ipswich. Alloys can be made into many things.

Ipswich Museum's mineral collection has been particularly enhanced by donations from Sir Charles Bunbury, Derek Ling, and Dr Derek Searle.

### Bronze

An alloy of copper and tin. This is the Halstead Medal of the Geologists' Association presented to Robert Markham in 2011, "for services to East Anglian geology and Crag palaeontology".

### Brass

An alloy of 60-70% copper and 30-40% zinc. This small bell is good for attracting attention!

### Jewellery with Malachite and Brass

This necklace, bought at the Victoria Falls, Zimbabwe has two green malachite beads from Congo and brass beads from Cameroon.

### Copper Jewellery

A mid-twentieth century American 'Matisse' brooch. Copper is colourful, but tarnishes slowly - the enamelling on this piece protects it.

### Foudroyant Copper

Souvenir made of copper from Nelson's flagship Foudroyant - launched in 1798 and wrecked at Blackpool in 1897.

### Copper Postcard

An engraved copper post card, produced by Kopper Kard company of Salt Lake City, Utah, USA. It features Holbrook, Arizona (not Holbrook, Suffolk!).

Copper is indispensable for electrical work because of its high electrical conductivity.

R Markham 2014