

ECTON MINE - FROM COPPER-BOTTOMED SHIPS TO A-LEVEL CHEMISTRY

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The outdoor laboratory at the G A Cox field studies centre, Ecton

The student smiled with surprise and pleasure when she lifted an iron nail out of the solution, covered with a pink sheen of newly deposited metallic copper. This morning she had collected the piece of ore from which she herself had extracted this copper. This is a typical scene at the outdoor laboratory of the Ecton Hill field study centre, where courses are provided for students of chemistry, geology, and many other subjects.



Chemistry tutor Bill Whitehead explaining transition-metal chemistry

Ecton Hill, on the Staffordshire/Derbyshire border, at the south-western margin of the Peak District, is the location of a mining enterprise which in its late 18th century heyday provided much of the copper needed by the Royal Navy. Ecton was the major UK source of copper in the 1760s-1780s, and was the deepest mine in Britain.

Today its industrial history is all but forgotten and it lies within one of the most attractive parts of the Peak District National Park. However, there is ample well-preserved surface and underground evidence of Ecton's past, and its mineralogical riches and unique geological setting provide the basis for a very 21st century approach to teaching, from junior school to university level and beyond.

Although the workings below river level are now flooded, those above are still accessible and contain much of geological and archaeological interest (recent research has demonstrated that the ore deposits were worked as long ago as the Bronze Age). On the hilltop there is the building which housed one of the first Boulton and Watt steam engines. This and many of the other surface features across the hill have been designated a Scheduled Monument. The mine workings themselves are also a national Site of Special

Scientific Interest (SSSI).

The Ecton Hill mines and the associated field studies centre are owned by the Ecton Mine Educational Trust (EMET), set up in 2005 after the death of Geoff Cox, the previous owner, who had developed them as an educational resource. This charitable company, under the chairmanship of John Bramley, a retired engineer and former mine manager in the Peak District, works closely with the Ecton Hill Field Studies Association (EHFSA) to provide a wide range of courses.

The chemistry A-level course, for example, typically consists of a one-day, 10 am – 4 pm, intensive sequence of activities. Normally two tutors run each day, with a maximum of 30 students with their teachers, usually from two schools or colleges. After an initial briefing at the centre, during which some background to mining at Ecton is introduced, the party set off up Ecton Hill to the engine house. Nearby the party inspects the hole where the main Ecton ore-body originally outcropped at surface, before walking on over the hill to mine dumps which offer a rewarding opportunity to collect mineral specimens. These are taken back to the centre where, in the outdoor laboratory, wet chemical analysis techniques are used to identify the

compounds in them. There is a further practical session on mineral separation techniques and the science behind them, and finally, as a climax to the day, an underground tour into Salt's Level in Ecton Mine.

EMET receives no public funding but has had financial support from the Royal Society of Chemistry, the Institute of Materials, Minerals and Mining, the London and Southern Counties Minerals Industries Institute (MinSouth), and the Mineral Industry Education Trust, as well as corporate members Anglo American plc and Rio Tinto plc, and much of the work of EMET is carried out by volunteers. As the Trust is responsible for all of the infrastructure, it has ongoing responsibilities for the safety of the 40 shafts and mine adits around Ecton Hill, as well as for the study centre itself.

The Trust remains vulnerable to any cuts in educational funding for what may be perceived as non-core extramural activities. However, if the UK's future is dependent upon the enthusiasm and achievements of its scientists and engineers, then such courses are absolutely essential in providing a link between textbook learning and the real world.

For more information, visit www.ectonmine.org

