WELCOME TO ALDERLEY EDGE COPPER MINES

Alderley Edge minerals

The main minerals found at Alderley Edge are identified by bold print in the list below.

Azurite $2CuCO_3.Cu(OH)_2$ – *blue copper carbonate*
Baryte $BaSO_4$ – *barium sulphate*
Bornite Cu_5FeS_4
Bravoite $(Ni,Fe,Co)S_2$
Brochantite $(Cu_4SO_4(OH)_6$
Calcite $CaCO_3$
Caledonite $Pb_5Cu_2(CO_3)(SO_4)_3(OH)_6$
Cerussite $PbCO_3$ – *lead carbonate*
Chalcopyrite $CuFeS_2$ – *copper/iron sulphide*
Chrysocolla $CuSiO_3.2H_2O$ – *copper silicate*
Covellite (Covelline) CuS
Djurleite $Cu_{31}S_{16}$
Enargite $3Cu_2S.As_2S_5$
Galena PbS – *lead sulphide*
Goethite - Limonite FeO(OH)
Gypsum $CaSO_4.2H_2O$
Libethenite $Cu_2PO_4(OH)$
Liroconite $Cu_2AlAsO_4(OH)_4.4H_2O$
Malachite $CuCO_3.Cu(OH)_2$ – *green copper carbonate*
Massicot PbO
Mimetite $Pb_5(AsO_4,PO_4)_3Cl$
Mn,Co,Ni complex oxides
Mottramite $Pb(Cu,Zn)(VO_4)(OH)_2$
Pyromorphite $Pb_5(PO_4, AsO_4)_3Cl$
Siderite $FeCO_3$
Wad and Asbolite (Asbolane)
Witherite $BaCO_3$
Wulfenite $PbMoO_4$

Glossary

The following are here defined in the context of the Alderley Edge Mines and mineral deposits.

Adit A horizontal tunnel driven into the hillside for access and drainage.

Antiform A convex shaped fold formed by compressional stresses in the earth's crust.

Assay The chemical quantitative analysis of an ore, undertaken to detect the proportions of certain elements or minerals in the ore.

Backfill A general term for waste material of various kinds placed in mine workings, passages or shafts to infill them after use.

Bed A section of rock that represents one period of deposition.

Bing hole See Box Hole.

Bole A primitive smelting hearth, driven by natural air blast.

Box hole A small shaft from a stope to a haulage level or collection point, down which the ore is tipped for conveyance out of the mine.

Buddle A wooden or stone trough used to wash finely crushed lead ore. The heavy lead minerals are caught on baffles while the lighter material is washed away.

Bunter Obsolete term for the lowest division of Triassic rocks in Germany, (Buntsandstein: Bunter Sandstone) traditionally applied to Pebble Beds and the Wilmslow Sandstone Formation in Britain.

Clasts Fragments of rocks that make up most sedimentary rocks. They can range in size from grains of sand all the way up to large pebbles. They form as a result of weathering and erosion breaking up other rocks.

Coffin level A level, usually handpicked, cut in the shape of a coffin on end with a wider section near the top for the miner's shoulders and narrower at top and bottom for head and feet to pass through.

Conglomerate A rock composed of clasts set in a finer-grained ground matrix.

Cross cut A passage or level cut across as opposed to along an ore body.

Deads Waste rock usually stacked in abandoned parts of mine workings (*see also* Backfill).

Diagenesis The process by which sediment undergoes chemical and physical changes during its lithification (conversion to rock). Compaction, leaching, cementation, and recrystallisation are all forms of diagenesis. Erosion and metamorphism are not.

Dip The slope of rock causes by tectonic processes in the Earth's crust.

Epigenesis Mineralisation of rocks at a date later than formation of the host rocks.

Fault A break in the earth's crust along which adjacent masses of rock have moved relative to one another.

Fault plane The plane along which movement at the fault takes place.

Firesetting The practice of lighting a fire against ore bearing ground to open up cracks and make it easier to extract the ore. A mining practice used before explosives came into general use.

Forefield The end of a passage or stope where mining has ceased. Evidence of the mining technique can often be observed more clearly at the forefield than elsewhere in a mine.

Formation A series of beds lying on top of one another that are grouped together in geological terms as they formed in the same environment.

Gangue Uneconomic waste, the matrix in which the ore minerals occur. In this instance, sand (quartz) and in places baryte.

Hagg Enclosure or portion of woodland marked off for cutting.

Helsby Sandstone Formation Forms the capping rock at the top of Alderley Edge and composed of a series of upward fining cycles stacked on top of one another, fining up from conglomerate, to sandstone to mudstone (known locally as Marl). In older literature, it is referred to as the Lower Keuper Sandstone. Part of the Sherwood Sandstone Group.

Horst or Fault Block An area of rock lifted up along faults. Usually forms a topographic feature of elevated ground.

Hough A ridge or spur of higher ground such as the outlier at Glaze Hill.

Joints Tensional cracks within a bed or rock, usually running in three directions through the rock perpendicular to the bedding.

Keuper Obsolete term for the highest of the three-fold traditional division of Triassic rocks in Germany (Keuper: Red Marl), originally used in that country but applied in Britain to the Triassic strata above the Wilmslow Sandstone Formation.

Level A horizontal or gently inclined gallery or tunnel in a mine.

Lode or **vein** Usually a well-defined, often near vertical zone of mineralisation. They do not exist at Alderley Edge, other than in small veins of baryte, and the word

'vein' is a misnomer for vertical zones of mineralisation impregnating the host rock.

Marl A mudstone rich in calcium carbonate. Many of the 'marls' in the Triassic rocks of Britain are in fact not enriched in calcium carbonate and are strictly speaking just mudstones.

Matrix The material that supports clasts in a sedimentary rock.

Ore (at Alderley Edge) Sandstone and conglomerate impregnated with ore minerals and gangue minerals, from which metal can be extracted at a profit.

Ore chute *See* Box Hole.

Ore-shoot Or 'pay-streak'. A rich portion of ore within an ore body, somewhat richer than the rest of the ore body.

Primary Minerals Minerals formed first in the ore deposit.

Raise or Rise An underground shaft driven upwards from one working to another, or driven upwards for the purpose of exploration.

Secondary Minerals Minerals formed by later alteration of the original primary minerals in the ore deposit.

Sherwood Sandstone Group (SSG) BGS litho-stratigraphical group in which the rocks of Alderley Edge lie. The SSG is represented at Alderley Edge by the Wilmslow Sandstone Formation and the Helsby Sandstone Formation.

Shaft A vertical or steeply inclined working, driven from surface to connect with the underground workings, or driven underground from one level of the workings to another.

Slickensides Movement-produced grooves along a fault plane. They indicate the direction of last movement of the fault.

Sough A drainage tunnel from a mine to a nearby valley or other low point. Common term in Derbyshire.

Stope A worked portion of an ore body left as an open cavity.

Syngenesis Mineralisation which takes place at the same time as host rock formation (syn-sedimentary), before sediment consolidation (pre-diagenetic) or at the same time as sediment 'hardening' (diagenetic).

Throw The maximum vertical movement of adjacent blocks of strata across a fault.

Triassic Period That period of earth's history from 230–190 million years ago, represented by rocks composing the strata of the Triassic System. Triassic rocks build Alderley Edge.

Upward Fining Cycle A sequence of rocks changing in character upwards from coarse sediment to fine mudstone, the products of sediment deposited in flood to drought conditions.

Wilmslow Sandstone Formation A series of geological beds, part of the Sherwood Sandstone Group that all formed in a desert close to the equator in the Triassic period; forms the bottom two thirds of Alderley Edge. It may be referred to in older literature as The Upper Mottled Sandstone.

Winze An underground shaft from one working to another for the purpose of exploration, access or ventilation, usually driven downwards.

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For further information, including how to visit the mines, visit the Caving Club website at www.DerbysCC.org.uk which has sections on history, geology, exploration and other topics. There is also information about joining in with the caving and mining activities of the Club. You can also purchase copies of The Alderley Edge Mines*, updated and re-published in 2012 from which this glossary has been extracted.*

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Derbyshire Caving Club – September 2019

OD03

MINERALS AND MINING TERMS

Alderley Edge, Cheshire

A summary of what is found in the ground at Alderley Edge

Words used by miners and geologists

Mining and geology are specialised subjects with their own terms which may be hard to understand. This leaflet should help you to appreciate your visit more.

DERBYSHIRE CAVING CLUB