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United Nations
Educational, Scientific and
Cultural Organization



**Cornwall and West Devon
Mining Landscape**
inscribed on the World Heritage List in 2006

A Cornish mining glossary

ADIT

A level tunnel (usually driven into a hillside) in order to give access to a mine, and used for drainage or the hauling of broken ore. Deeper adits did not necessarily connect to surface, and were used to carry water back from distant workings to a pumping shaft

ADVENTURER

A shareholder in a mining operation

AGENTS

The managers of a mine

ANGLE BOB

A simple lever-based device using which the direction of a reciprocal motion (of pump rods, flat rods) could be changed (for example from horizontal to vertical)

ARSENOPYRITE

An ore of Arsenic; also termed **MUNDIC** or **MISPICKEL**

ASSAY HOUSE

The mine laboratory, where samples of ore were analysed for their mineral content

ATTLE

The waste rock produced through the mining process; also known as **DEADS**

BACK OF LODGE

The upper part of the lode

BAL or BALL

From Cornish 'pal' a shovel, and hence 'a digging' = a mine; generally applied to earlier mines. See also **WHEAL**

BALANCE BOB

A large counterweighted lever attached to the shaft pump rods and used to offset their weight and thus reduce the work of a pumping engine to lifting water alone. A surface balance bob would be mounted adjacent to the shaft on a pair of plinths or on a masonry support at ground level (balance bob mounting), the attached counterweight - a large box filled with scrap iron or rocks - working in an adjacent stone-lined pit. Other balance bobs would be installed in chambers cut into the rock adjacent to the shaft wall as needed to counterbalance the weight of the pump rods, especially on a deep shaft

BAL MAID

A woman or girl employed at surface on a mine, generally in the dressing of ore

BARGAIN

An agreement between a group of mineworkers and the mine managers to work a specified area at an agreed rate

BEAM ENGINE

A type of steam-engine much favoured in Cornwall for use in pumping, winding, and providing the power to crush ores preparatory to dressing on Cornish mines. The power from a large cylinder set vertically in an engine-house was transferred via a massive rocking beam or bob to the pumps in the shaft outside. For winding and crushing, the bob was instead attached to a flywheel and crank on a **LOADING** next to the **BOB WALL** (or in the case of all indoor engines, the side wall). In most cases, the engine house formed an integral part of the framing of the engine

BEDSTONE

The granite slab which formed the foundation for the cylinder of a Cornish Engine

BLACK TIN

The refined concentrate of tin ore or cassiterite (tin dioxide - SnO₂)

BLOWING HOUSE

An early form of tin smelting furnace, small in scale and using charcoal as a fuel

BOB WALL

The front elevation of an engine house used to support an engine's heavy rocking beam or bob, which has been robustly constructed to resist the significant loading and vibration forces produced by a working **BEAM ENGINE**

BOILER HOUSE

A generally lightly-built structure attached to an engine house, and designed to contain the horizontal boilers for a steam engine; the associated chimney stack may be attached to this structure, or built into one corner of the engine house

BORING MACHINE

Alternative term for a **ROCK DRILL**

BOUNDING

A traditional term used to describe the process of establishing a legal claim to extract tin or other minerals from a specified area

BRATTICING

Timber partition work in a mine, for instance the **LAGGING BOARDS** which lined the upper section of a shaft where it ran through soft ground

BROKEN ORE

Ore which has been mined and is ready for processing to remove impurities (see **DRESSING**)

BUCKING

The breaking down of copper ore on an anvil to about 10mm in diameter by bal maids using small hammers, after which the ore was separated from the waste by hand. This process followed cobbing, in which it had been broken down to about 25mm in diameter, the waste again being hand removed. These processes, through which the majority of the highest quality copper ore was recovered, took place within roofed structures called bucking houses

BUDDLE

A device for concentrating tin ore; in the mid-19th century these most usually took the form of a circular pit with rotating brushes; the tin from the stamps was fed into the centre or side of the pit and was graded by gravity, concentrating the heavy ore near the inlet point. These were often mechanically worked. Earlier buddles were trapezoidal in shape, and manually operated. A variation was the dumb buddle or dumb pit, which was not mechanically operated. See also **ROUND FRAME**

CALCINER

A furnace and heating chamber in which ores were roasted to drive off impurities such as sulphur and arsenic; these were also known as Burning Houses, later patterns being of REVERBERATORY design. The Brunton pattern calciner, introduced in the mid-19th century, was mechanically powered, and operated on a continuous basis, unlike earlier designs. Other patterns of calciner were also devised, the majority named after their designers (e.g. Oxland, Hocking and Loam)

CANDLE FACTORIES

An enormous amount of candles or DIPS were required by 18th and 19th century mineworkers to light their working areas underground. The candles were made in specialist factories across Cornwall and west Devon

CAPSTAN

A manually or steam-operated winding drum, usually installed on a mine to raise pitwork from the shaft for maintenance or repair

CATARACT PIT (or cock pit)

A sub-floor area within the foundation levels of an ENGINE HOUSE between the

CYLINDER PLAT and the BOB WALL, containing the regulating apparatus, and giving access to cylinder hold-down bolts

COBBER

A mine surface worker, usually female, employed in copper ore dressing to remove waste from the mineral by means of a long-headed hammer; see BAL MAID

COFFIN or GOFFEN

The narrow excavation resulting from stoping on a lode being carried to or from surface, on part or all of a lode; see also GUNNIS, STOPE, OPENWORK

CONCENTRATE

Ore ready for smelting after having been treated to remove the maximum amount of impurities

CONDENSER

The cast-iron cylinder set in a tank of cold water immediately in front of the bob wall of an engine house in which the exhaust steam was condensed, creating a vacuum which greatly increased the efficiency of a steam engine. For a pumping engine this equipment was often contained within a pair of masonry walls projecting from the bob wall towards the shaft

CORNISH BOILER

A type of steam boiler which has a central fire-tube passing through the boiler from the fire box, and brick flues which circulate the hot gases under the boiler before being discharged

CORNISH ENGINE

Style of high-pressure steam beam engine invented and perfected in Cornwall – see BEAM ENGINE

COUNT HOUSE

Properly 'Account House', but generally shortened; the mine office, sometimes incorporating accommodation

COUSIN JACK CHUTE

A timber/steel structure used for the controlled removal of broken rock/ore from STOPES and ore passes into rail-mounted wagons

CROSSCOURSE

A geological formation which traverses the STRIKE of a mineral LODE

CROSSCUT

A drive mined across the STRIKE of a LODE for access or exploration. Often mined on a GUIDE for easier progress, and with the potential to discover unknown mineralisation

CROUST

Food – also termed ‘crib’, ‘mossel’ or ‘bait’

CRUCIBLE WORKS

The process of testing ores to assess their mineral content required specialised equipment, one type being the crucible. Often of fired white clay, the crucibles were small dish-like or conical vessels and a number of works were established to produce these throughout Cornwall and west Devon

CULM

Geological strata underlying coal measures; also waste from anthracite coal mines, consisting of fine coal, coal dust and dirt

CULVERT

A small tunnel constructed to carry a channel of water

CYLINDER OPENING

The often large arched opening in the rear wall of an engine house through which the steam cylinder was brought during the erection of an engine; this opening was generally subsequently closed off with a timber partition and usually incorporated the principal doorway into the engine house

CYLINDER PLAT

The massive masonry base on which the cylinder of a Cornish Engine was bolted down (see also BEDSTONE)

DAYWORK

A form of employment where mineworkers undertook tasks, either at surface or underground, for which they received a daily rate; also known as ‘company account men’ or ‘lord’s men’

DEADS

Waste rock discarded after mining or processing

DIAL

A form of compass used to survey mineworkings

DIPS

Tallow based candles made in large quantities for use underground

DRESSING

The concentration of the tin (copper or other ores) contained in the rock excavated from the stopes of a mine. Carried out on DRESSING FLOORS

DRESSING FLOORS (also TIN MILL)

An (often extensive) area at surface on a mine where the various processes of concentration of ore took place - these consisted of crushing or stamping to attain a uniform size range, sizing (particularly on later mines), separation of waste rock, concentration (generally mechanically and hydraulically on tin mines, manually on copper mines), the removal of contaminant minerals (by calcination, flotation, magnetic separation), and finally drying and bagging for transportation to the smelter. Tin floors

in particular were generally laid out down a slope to reduce mechanical or manual handling between stages in the process

DRIFT

Any horizontal or near horizontal working underground that usually does not connect with the surface

DRILL STEEL

A steel bar used by hand or machine for drilling into rock. Hand versions are usually chisel-tipped and in sets of three with the longest being 2 feet (0.6m) long

DRIVE (alternatively lode drive or heading)

A tunnel excavated on the line of a lode as the first stage of the development of a STOPE

DRY or CHANGE HOUSE (earlier MOOR HOUSE)

The building within which miners changed their clothes before and after going underground; some were heated by steam pipes connected to the engine boilers. Where there were large numbers of women or children employed on a mine, there might be two dries - one for men, the other for women and children. The pithead baths or wash houses found in collieries were rarely present in Cornwall

DUES

The royalty payment made to the owner of the mineral rights, paid by the mines' operators as a proportion of the value of the ores raised

DUMP or BURROW (alternatively spoil dump, spoil tip)

A pile of waste material, usually from a mine or quarry; may contain primary waste (where this could not be disposed of underground) or waste from various stages in the dressing process. TAILINGS LAGOONS stored the extensive slimes from the final stages in the process; in earlier mines these were flushed over cliffs or allowed to wash away in streams or rivers

DUTY

A measured assessment of the efficiency of a steam engine calculated by the weight of water lifted one foot high (0.3m) by the use of one bushel of coal

EDUCTION PIPE

The large diameter pipe through which exhaust steam was drawn into the condenser set outside the BOB WALL

ENGINE HOUSE

A building designed to contain steam, gas, oil or electric engines on a mine or other works. When forming part of the framework of a beam engine, these were particularly strongly constructed

FATHOM

The common measurement of distance or depth used in a mine equivalent to 6 feet (1.82m)

FINGER DUMP

A linear dump of waste material from a mine or quarry, flat-topped to allow material to be barrowed or trammed along it, and often equipped with a temporary tramway track

FLAT RODS

Reciprocating (or very occasionally rotative) iron rods used to transfer power from a steam-engine or water-wheel to a remote location

FLUE

A masonry-constructed tunnel or conduit connecting a furnace to a chimney stack

FOOT-WALL

The ground or 'country rock' below a mineral lode

FROTH FLOTATION

The process of ore refining where impurities or the ore itself are removed from a solution of chemicals frothed by continual aeration

FRUE VANNER

A mechanically-driven, laterally vibrated, inclined rotating belt on which fine tin-containing material in suspension in water was treated by relative density

FUSE

A combustible braided cord used for shot firing (blasting) which burns at a specific rate (also Safety Fuse)

GAD

An iron or steel wedge used to break rock when used in conjunction with a hammer

GANGUE

The valueless minerals which surround, or are intermixed with, the ore or ores being produced

GIG

A man-riding skip or cage within a mine shaft

GIRDER

The massive timber beam set across an engine house just below top floor level to which the parallel motion was attached and on which the spring beams sat, also known as the 'main beam'

GOFFEN (see COFFIN)

Generally applied to an excavation along the STRIKE of a LODE which is mined from the surface only

GOSSAN

The upper part of a mineral vein as it breaks surface. The natural weathering of the rock will decompose metallic sulphides, characteristically leaving a porous rust stained quartz

GRASS

The term for the surface of a mineworking

GUNNIS

A narrow linear excavation left where a lode has been worked, most commonly used when open to surface. See COFFEN

GUNPOWDER MILL

A works for the production of gunpowder which usually comprised a series of incorporating mills, similar in some respects to the grinding mills used for corn, and additional process buildings for the drying, finishing and storage of the explosive

HALVANS

The accumulations of discarded rock at surface, produced as a result of ore dressing operations

HANGING-WALL

The ground or 'country rock' above a mineral lode

HATCHES

Pits excavated to locate SHODD tin deposits (cassiterite - SnO_2). See also PROSPECTING PIT / FOSSICKING PIT OR COSTEANING PIT.

HEAD or CROP

The richest part of material in a buddle - nearest its feed point

HEADFRAME (HEADGEAR)

The tall construction set over a winding shaft which carried the sheave wheels over which the winding ropes ran. Headframes usually contained ore bins or ore chutes to allow the broken rock in the skips or kibbles to be tipped into trams at surface

HORIZONTAL ENGINE

A steam engine where the cylinder(s) are set on a horizontal bed and the piston rods are attached via a cross-head to a crank and flywheel

HORSE WHIM

Similar to a capstan, but in this case power supplied by a horse walking around a circular platform (PLAT) was applied to an overhead winding drum; frequently used for winding from small shafts on Cornish mines, especially during exploratory work and shaft sinking. The smaller under-gear whims found in some 19th century farms were little used on mines

INCLINED PLANE

A slope laid with rails enabling wagons on a tramway or railway to be raised up a steep rise by rope or wire; powered by steam or gravity

JIG

A large mechanically or hand-operated sieve set in a tank of water using which ore could be separated by waste; sometimes constructed in groups within jiggling houses

KIBBLE

A large, strongly-constructed, egg-shaped, iron container used for ore and rock haulage in earlier shafts. Superseded by SKIPS

LABYRINTH (colloquially 'lambreth')

A series of interconnected masonry-constructed chambers set adjacent to one another on whose walls the arsenic vaporised in a calciner or arsenic furnace was condensed out. The gas followed a zigzag path through such groups of chambers, and one end of each chamber would be closed off with a door using which the condensed arsenic could be collected

LAGGING BOARDS

The timber planks lining the upper part of a shaft, or where it ran through soft ground

LANDER

The mineworker who receives the ore kibble or skip at the top of a haulage shaft, also known as the 'banksman'

LAUNDER

A wooden or steel trough used to carry water or other liquids; often used to feed water or finely-divided material in suspension around a dressing floor

LEAT

An artificial water-course, built to carry a supply of water to a mine

LEVEL

A sub-horizontal tunnel driven to explore for valuable mineral, to remove the mineral, and/or for other purposes; alternatively a lode drive or heading

LINTEL

The horizontal timber or stone support above an opening in a wall or structure

LOADING

The masonry platform in front of an engine-house (or elsewhere on a mine) on which machinery such as cranks, flywheels or winding drums were mounted and on which the reciprocal motion of the sweep rod attached to the beam was turned into a rotative motion

LOBBY

The excavated cutting running up to an adit portal

LODE

A linear area of mineralization underground; in other parts of Britain termed a VEIN, or SEAM. Generally vertical or near-vertical, and often extending for considerable distances along its strike

LODE-BACK PIT

A shallow shaft dug from surface into shoad or the upper part (backs) of a lode, from which ore could be extracted from shallow stopes to the depth of the water table or just below. Waste material was generally dumped adjacent to the shaft mouth

MAGAZINE

Small strongly built store containing explosives (gunpowder or dynamite); often circular, sometimes with additional enclosing walls to contain the blast of an accidental explosion

MAN-ENGINE

A mechanical device used in mines to raise and lower men in a shaft using a system of platforms attached to a reciprocating rod extending the depth of the shaft

MINERAL LORD

The owner of the mineral rights to a SETT

MINEWORKERS' SMALLHOLDINGS

Small plots of land, usually from 3-5 acres (1-2 hectares) in extent, which were leased to miners on which to build a cottage and lay out fields

MISPICKEL

An ore of arsenic; also ARSENOPYRITE or MUNDIC

MUNDIC

An ore of arsenic

MELLIOR STONE

The granite bearing stone in which the upright shaft of a HORSE WHIM ran

MIDDLES

The material in a buddle found between the crop and the tailings, this generally containing enough ore to warrant its re-treatment

OCHRE WORKS

An ancillary industry which utilised the mining by-product ochre to produce a vivid red/brown dye, often used in the manufacture of cloth

OPENWORK or BEAM

A mineral extraction site open to the surface and similar to a quarry but usually distinguished by its elongated shape, and steep sides; generally applied to features broader in extent than a GUNNIS OR COFFIN; a variety is a STOCKWORKS, where an area of ground containing a large number of small parallel lodes was removed wholesale

ORE

A mineral or mixture of minerals which could be worked for sale

OVERBURDEN

The topsoil and subsoil removed in the process of opening or extending a quarry, streamworks or mine

PICKER

A mine surface worker, usually female, employed to hand-select copper ore during the dressing process. See BAL MAID. Term later applied to those employed to remove scrap and rubbish mixed with the ore on mechanically-operated picking belts

PELTON WHEEL

A small enclosed water turbine, working at high pressure and rotational speeds; in use from the later 19th century

PARE

A usually small group of mineworkers who through agreement work a particular area underground and share in the resulting costs and profit

PITWORK

The term used to describe the pump rods, rising main, shaft guides (buntons) etc. within a shaft

PLACER DEPOSITS

Glacial or alluvial deposits of sand or gravel containing eroded particles of valuable minerals

PORTAL

The entrance to an adit beyond its LOBBY; often timbered or stone vaulted

PROSPECTING PIT / FOSSICKING PIT OR COSTEANING PIT

A small pit dug in search of minerals, and almost always found in linear groups, often arranged cross-contour, or at right angles to the projected strike of known lodes or deposits of shoad. A COSTEANING TRENCH is a linear excavation cut for prospecting purposes

PUMP ROD

A continuous timber rod fitted in a shaft to drive underground pumps via its reciprocating action

PURSER

The treasurer and secretary of a mine who is responsible for the accounts and the payment of workers

RAG FRAME or RACK FRAME

An inclined table-like surface on which very fine slimes in slurry form were treated to recover their tin; large mines would have hundreds of such frames arranged in groups

RAISE

A vertical or angled tunnel mined upwards to connect with other workings, sometimes as the first stage in the development of a STOPE

REGULUS

The mass of metal, in an impure state, which forms in the bottom of the crucible during the smelting and reduction of ores

REVERBERATORY KILN

A design of furnace in which there was indirect contact between the heat from a hearth and ore to be roasted, usually by incorporating a baffle flue

ROCK DRILL

A machine for drilling shot holes in rock, usually powered by compressed air

ROPE-WALK

A linear strip of land set out to facilitate the braiding of long ropes intended for mining or maritime usage

ROSE

The cast-iron strainer attached to the bottom lift of pumps

ROTATIVE ENGINE

A beam engine in which the reciprocating motion of the beam was converted to rotary motion via a sweep rod, crank, and flywheel

ROUND FRAME

A timber constructed tin concentrating device with a rotating deck, employing water flow and gravity to separate fine tin ore from gangue or waste minerals; working on similar principles to the BUDDLE

SAFETY FUSE

A reliable means of detonating explosives which was developed in Cornwall by William Bickford in 1831; consisting essentially of a braided cord filled with gunpowder, safety fuse was later adopted by mines world wide

SETT

The legal boundary within which a mine could extract minerals

SETT

One of a series of stone supports for a tramway, performing the same function as sleepers

SETT

One of the components of timber framing of an adit where it ran through loose ground; also the timber framing of a shaft to which the shaft guides and LAGGING BOARDS were attached

SHAFT

A vertical or near-vertical tunnel sunk to give access to the extractive areas of a mine

SHAFT HEDGE

A surrounding safety wall, usually of stone rubble, constructed to prevent people or animals from falling down an open mine shaft

SHAKING TABLE

A slightly inclined, mechanically vibrated table on which fine tin (as sands or slimes) in suspension in water was concentrated by relative density

SHEARS or SHEAR LEGS

A tall timber frame carrying a pulley or sheave wheel erected in front of an engine house over a shaft and used for the installation and maintenance of PITWORK

SHOAD or SHODE

Ore weathered from the lode and moved (in geological time) downslope under the force of gravity. Material reaching a river valley would be to some degree concentrated before redeposition in horizontal beds. These beds of detrital material (placer deposits) were exploited in streamworks

SKIP

A (generally elongated) iron or steel container equipped with small wheels or brackets running on the shaft guides (buntons) and used for rock and ore haulage in later mines

SOLLAR

A small boarded platform at the base of a ladder within a shaft, or within a STOPE or other working area underground

SPALLERS

Mine surface workers, usually female, employed in the dressing of copper ore to reduce the mineral to a size suitable for further processing; see BAL MAID

SPRING BEAMS

The pair of longitudinal timbers extending from the rear of an engine house parallel to and on either side of the BEAM at top floor level. These served to arrest any unwanted excess indoor motion of the beam via catches set onto its rear and were extended out from the front of the house to form the foundation for the bob-plat (the timber platform from which the bearings on the outdoor section of the beam could be serviced)

STACK

A chimney on an industrial site used to carry away smoke or fumes from boilers, furnaces and calciners; often situated at the end of a FLUE

STAMPS

A mechanical device for crushing ore-bearing rock to fine sand; heavy vertically-mounted beams (or later iron rods) carrying cast or forged iron heads were sequentially lifted and dropped onto the prepared ore beneath them by a series of cams mounted on a rotating drum; this usually being driven by a water-wheel or rotative steam engine

STANNARY

Pertaining to tin mines or miners and with its roots in the Latin 'stannum' (tin); the Stannary Parliament and Stannary Courts existed for the administration of justice among the tanners within Cornwall, Devon and elsewhere, and were also courts of record. The powers of the Stannary Parliament included the right to veto laws from the Parliament at Westminster and some claim that these powers have fallen into abeyance but have never been repealed

STOPE

Excavated area produced during the extraction of ore-bearing rock; often narrow, deep and elongated, reflecting the former position of the lode. Where open to the surface these form GUNNISES or COFFENS

STREAMWORKS

An area worked for detrital (redeposited) tin deposits by shallow excavation; often characterised by linear dumps, river diversion, and evidence for LEATS. Some streamworks (dryworks) exploited deposits of shoad in now dry valleys and on hillsides, where concentrations of this material were economically workable. Leats and reservoirs were necessary to work these sites, and are characteristic of them

STRIPS (settling strips)

Elongated shallow tanks in which the primary settlement and subsequent separation of tin ore from waste took place after it had been stamped

STULL

Timbers placed in the upper parts of levels or stopes to support the walls; or to form platforms to store waste rock, or to provide support for staging while working

SWEEP ROD

The elongated iron rod which connected the beam of a Cornish engine to a crank and fly wheel

TAILINGS

The waste sand and slime from a mine dressing floor, not containing workable quantities of mineral

TAILRACE

The channel along which water flows after having passed over or under a water-wheel and is then generally returned to the water course

TICKETINGS

Regular meetings, often weekly, for the purpose of selling refined ore

TIN MILL

See DRESSING FLOORS

TRAMROAD (or TRAMWAY)

A method of transportation for ore and materials at surface using iron plates or rails; similar to a modern railway and operated using either horse or locomotive power

TRIBUTE

A system of payment ('by results') in which groups of mineworkers bid against one another for contracts to work sections of the mine for a percentage of the value of the ore raised from that area

TUTWORK

A system of payment relating directly to the extent of ground broken or by depth of shaft sunk or length of level driven, whereby groups of mineworkers contracted to work at previously agreed rates

UNDERHAND

Describing a STOPE worked from the top downwards

UNDERLIE

Angle of inclination of a LODE or geological structure as measured from the vertical

VANNER

A person employed on the surface of a mine to check or assess the tin content at each stage of the refining process. The VANNING SHOVEL was used to test the relative concentration of ore in a sample of finely crushed ore or partially dressed ore

WATER WHEEL

Wheel fitted with buckets or paddles around its periphery, and driven by the weight or force of a stream of water directed onto them

WHEAL also WHELE, WHILE, HUEL

A mineworking

WHEEL PIT

A structure built to house a water-wheel, often excavated and stone-lined, but sometimes free-standing

WHIM

The winding gear used for hauling from a shaft; consists of a power source and a winding drum. See also HORSE WHIM

WHIM PLAT

The level and usually circular platform on which a HORSE WHIM was sited

WIND BORE

The cast-iron strainer attached to the bottom lift of pumps within the sump of an engine shaft

WINZE

A vertical or angled shaft mined downwards and not connecting to surface