BRITISH MINING No.25

MEMOIRS 1984

Hewer, R.E. 1984
"Bannerdale Lead Mine"
British Mining No.25, NMRS, pp.26-30

Published by the

THE NORTHERN MINE RESEARCH SOCIETY
SHEFFIELD U.K.

NB
This publication was originally issued in the A4 format then used by the society. It has now been digitised and reformatted at A5. This has changed the original pagination of articles, which is given in square brackets.

ISSN 0309-2199

BANNERDALE LEAD MINE

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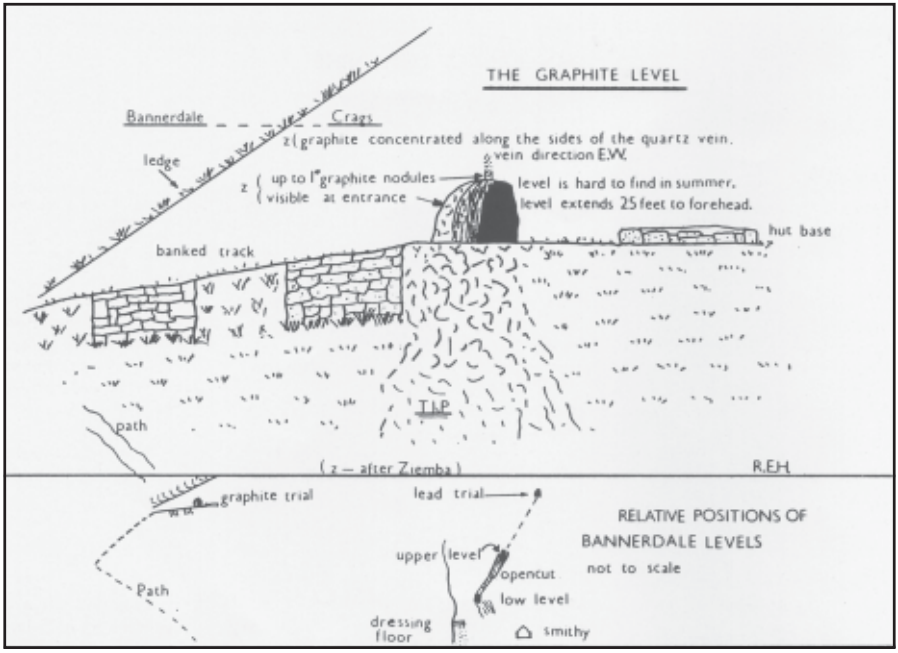
SYNOPSIS
A mine – little more than an extended trial – working galena in Bannerdale is described along with an outline of the geology of the district. Also discussed is the presence of a level which was driven to work graphite at the same site. Difficult of access, the mine has remained virtually untouched since sporadic activity ceased here in 1870. The surface remains are also noted.

Bannerdale lead mine is situated near the base of Bannerdale Crags, 2 miles WSW of Mungrisdale and NE of Saddleback, near Keswick, Cumbria. O.S. 335295. The mine is guarded by a large swamp and it requires some effort to circumnavigate the area to reach the workings and smithy/office. As one approaches the basin beneath a segment of the Bannerdale crags, the lead vein can be traced diagonally up the face of the crags. The vein follows as part of its course a hornfelsed dyke.[1] The lode runs from East to West through the spotted schist of the Skiddaw metamorphic series, (Chiastolite crystals in slate) and hades at 20˚ from the vertical.[2]

The mine was reported to be in operation during 1854 when 7 tons of Galena were raised producing 4½ metallic tons.[3] It could be safe to assume that this was the main period of working although a further trial was made in 1870 by Mr. Crozier.

The Graphite Trial

The graphite level can be seen from the approach road. It is situated 100 yards South of the lead vein at a higher level than the upper workings on the lead vein. Records show that in 1868 a level was driven some 25 feet along a quartz vein. The vein was said to be worked for grate polish and pencil making, the graphite occurring as nodules up to an inch in diameter along the side of the quartz vein. Some graphite was found in the dark shales nearby.[4] Present day inspection of the level reveals that certainly a small amount of graphite is detectable along the sides of the quartz vein and on the south (left hand) wall of the level but quantity and quality must have been low. In probability most of the graphite came from the Bannerdale lode. Quoting Ward,[5] 'Plumbago is said to occur in the Bannerdale Lode, to the North of Blencathra. This vein has been very slightly worked and though there appears to be an irony carbonaceous mineral adhering to the sides of the lode and sparingly distributed, it seems probable there is no genuine good plumbago; nevertheless some of the mineral was worked for grate polishing, and Bannerdale pencils are said to have been made'. The important sentence follows:- 'The vein contains a great deal of barytes and some galena; its course is nearly east and west and it traverses rocks of spotted schist'. It is obvious from the latter statement that Ward was not referring to the trial, for this was



SMITHY AND OFFICE

a quartz vein. One can find in the lead workings odd patches of what looks to be decomposed black shale, especially near the lead string in the Bannerdale lode.

To the North side of the graphite trial are the remains of a small 6 foot square hut. Only the first two courses of rough walling remain. To the south are two walled sections forming a banked track which ends a few yards down the slope. A small path continues from the end of the track, zig zagging to the valley floor. The trial is hard to see and find in summer, shadows and vegetation tend to camouflage the area.

In correspondence with Mr. T.G. Ziemba, the writer obtained the following salient information concerning the area.

The mineralization visible at Bannerdale should be considered in the light of the fact that veins in the Skiddaw Slates are usually poorly exposed. The slates vary from incompetent mudstones to substantial grits and the former usually require a little assistance to develop worthwhile mineral veins. This “assistance” can be an increase in competency usually due to silicification or metamorphism (regional or local). Alternatively a local structural feature can assist in keeping a fracture open to allow free passage of mineralizing solutions in a rock type that tends to choke faults with rubbish. Pre-existing igneous dykes are particularly helpful regarding the development of ore shoots in unfavourable slate – probably due to providing a line of weakness, localized metamorphism and silicification. The influence of igneous dykes in the area has been underestimated.

After collecting samples from the Graphite vein, one was eventually examined by X-ray analysis and found NOT to contain any graphite - only a ‘mica’ that was not identified. The material would mark paper poorly and was obviously not molybdenite. Additionally, ignition bleached the colour without any sublimate or new residue. The release of CO_2 found on ignition was not adequate for diagnosis since the samples were not pure.

The graphite is probably amorphous carbonaceous matter in a matrix containing more or less (sericite) mica. This material is associated with the quartz vein the writer (T.G. Ziemba) believes has mesothermal affinities. If the vein is mesothermal, one could suggest a possible connection with the underlying granite. However this does not imply actually originating from the granite itself. Mesothermal veins commonly alter argillaceous rocks (Skiddaw Slates) and their alteration products into materials such as sericite mica.

Sericite is a term used largely for convenience in describing light coloured mica-like minerals which have a wide range of compositions. It can be pulverized under friction and, if pigmented, would yield a tinted or coloured streak which would be inferior to

graphite. I would suggest that amorphous carbon, perhaps derived from the Skiddaw slates, is responsible for the grey sericite. The Skiddaw slates contain small amounts of carbonaceous material, probably derived from the organic matter deposited at the time the original mudstones were formed. Metamorphism of the mudstone to slate should have guaranteed full alteration of any organic matter into carbon. This carbon could be present either as microscopic graphite or as amorphous carbon. Both forms occur as parallel layers of six-sided rings. In either case, carbon is available in the country rock and could be locally mobilized and/or reworked under the influence of a mesothermal vein (however, one should bare in mind the carbon may have originated elsewhere). There is an association between carbon/graphite and mica/mica-like minerals and it would not be unexpected for sericite to contain carbon in some form if the latter were available - especially if the sericite and carbon had a common origin.

The question of the Bannerdale "graphite" could be reopened as an academic exercise.

Bannerdale Mine Buildings

The structure is divided into a smithy and store/office. Now overgrown and suffering from the elements and an encroaching tree, there is still much to be observed. The store fireplace, niches and wall plastering are present. Some roof timbers and slates lay scattered around. The building would be worthy of tidying up and preserving. In the smithy section, the hearth is intact with ashes and coal in situ. A small 'V' shaped wooden outlet passes through the rear wall, which probably acted as a drain during smithying operations. From inspection it is apparent that the smithy was added after the store was built. The building tapers in width along the total length, being the widest in the smithy (west) and narrowest in the store (east). The building was erected on a small rocky knoll rising out of the swamp at the base of the crags.

The Vein

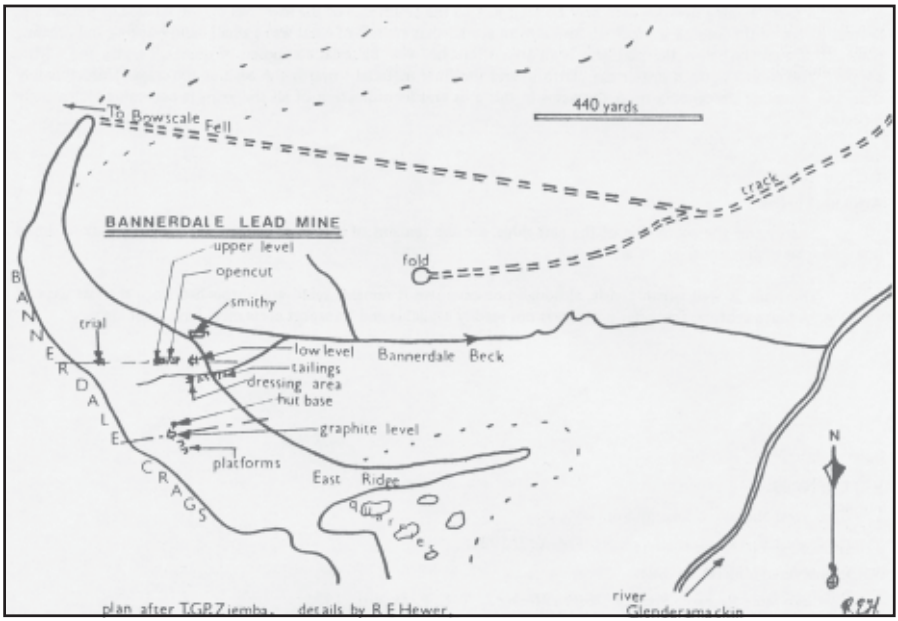
Much of the area around the crags has considerably altered since the excellent survey was made by T.G.P. Ziemba in 1975 (BMl). I must confess that at the time of my first visit I completely missed the graphite level. The low lead level does not connect with upper working and the vein at this horizon is very pinched and poor. The level runs for about 150 feet. The vein contains sugary quartz and barytes although zinc is reported, the latter is rather hard to find. The level floor is deep in orchreous mud due to the oxidisation of iron in the slate. From the low level the vein can be followed upwards as an opencut to the upper level. Quite a lot of work has gone into producing the opencut which leaves one wondering whether the vein at surface was a rich localised pocket of ore. The upper level is entered from the open cut, as a level entrance stepped some 6 feet above the base of the opencut rubble. Once in the level the stope stands 12 feet high above the rubble floor, it is 6 feet wide and runs for a hundred feet before dropping into the true level where the veins (3 in total) pinch, split and appear to die out. Along the roof of the stope there is a good exposure of the

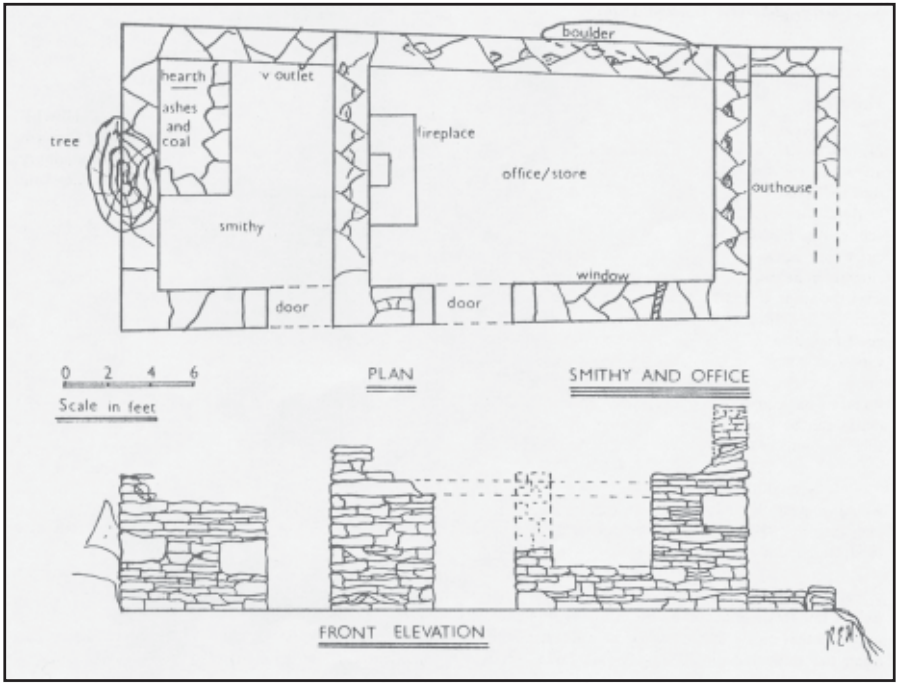
veins, a general width between 4 and 6 feet. The colour of the barytes veins within the lode varies from white to pink and of good quality, the white vein is 8 inches wide and 6 inches wide along the length of the pink barytes vein. The barytes veins continually split and join along the length of tile worked section. The lead vein can be seen clinging to the hanging wall. Several large sheets of galena, ¾ inch in width are still in situ. Drill marks can be seen following the vein, small quantities of copper may also be collected. A careful search will reveal small amounts of a graphite substance as mentioned earlier.

Several timbers are in position and judging by the areas of stacked waste along the standing wall side it would suggest that working platforms had been erected at 6 foot vertical intervals to work the lode. Minerals identified in 1983 in the upper level were:- Barytes, Galena, Malachite, Linarite, Chalcopyrite; Sphalerite in the low level; Graphite in the upper lead workings(?)

Above the upper workings and along the line of the vein another small trial can be seen. The trial enters for only a few feet and shows a vein of quartz and patches of barytes. Looking down from the upper levels it becomes apparent that only a small amount of waste has been thrown out from the workings, although the upper working has a fair size stope and the opencut is quite large, the waste visible leaves a question mark as to the richness of the vein.

[28]





The Dressing Floor

A small sloping dressing area may be seen just to the south side of the low level on the far side of the stream. Several pieces of timber and a small raised platform are all that are left of what was a small hand bucking and dressing plant. Immediately below the platform is an area of crushed vein material composed of quartz, barytes and a little copper. The course waste is nearer the platform and the finer material towards the base of the crags. Unfortunately slate and scree are descending onto the veins in this area and identification of all the veins is becoming increasingly difficult.

Adjacent areas

Nearby, on the south side of the east ridge, are the remains of several slate quarries. The black slate shows fine examples of chiastolite crystals.

The mine is well worth a visit, although not extensive it remains relatively untouched since the last days of working. A brave venture, for water power was not readily available and transport costs must have been high.

REFERENCES

1. *Geological Survey.* Cockermouth.
2. Geological Survey. *Special Reports. Vol. XXII* 1921.
3. Cumberland Mineral Statistics.
4. Northern Mine Research Society. *British Mining 1*. T.G.P. Ziemba. 1975.
5. *Geological Survey.* C. Ward. 1876.

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