

Kelly Mine: The First Ten Years

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Abstract

The following account tells of progress in the restoration of Kelly Mine, a small micaceous hematite mine near Lustleigh in Devon. The restoration, which has been carried out by dedicated members of the Kelly Mine Preservation Society is now in its tenth year and much has been achieved. A short history is provided and various aspects of the original working of the mine as well as the current restoration are discussed. The problems and potential of oral and documented history as a means to authentic restoration are highlighted, as is the value of contemporary photographs.

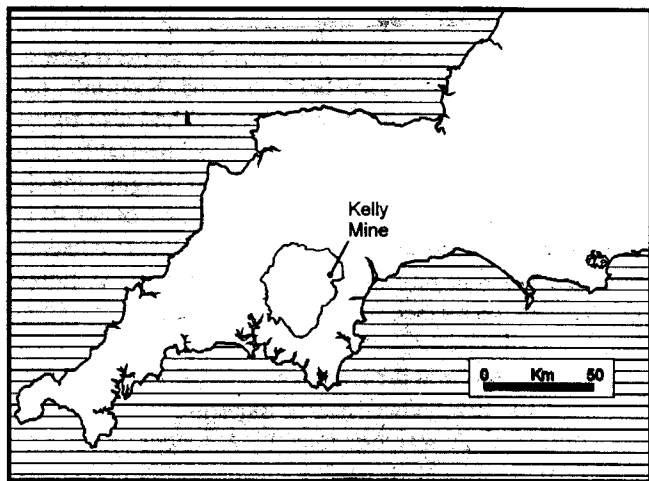


Fig. 1. Kelly Mine. Location.

GEOLOGY AND MINERALISATION

Kelly Mine is situated just within Dartmoor National Park, 6.5km north-west of Bovey Tracey (SX 795818). It is one of a group of small mines in the Wrey valley which includes Plumley, Pepperdon, Hawkmoor and Shaptor. The most important of the micaceous mines was Great Rock, situated in the adjacent valley to the east, near Hennock.

Kelly Mine lies in granite which is a projection from the main Dartmoor massif. Numerous mineral lodes coursing E.N.E. occur in the area and they almost all contain micaceous hematite with a little pyrite. The lodes occur irregularly in thin veins varying in width from a few millimetres to a metre, in steep northerly dipping zones of altered granite.

The ore is locally known as 'shining ore' due to its foliaceous nature, fine particle size and the fact that it leaves an oily feel on the skin when handled. In its truly lamellar form micaceous iron oxide consists of sparkly, metallic grey, flake-like particles having a crystalline structure closely related to mica which gives rise to its description as micaceous. In fact it does not contain mica although it possesses many similar characteristics. It varies slightly from mine to mine in both colour and appearance. At Hennock it is soft and has a distinct purple tint whilst at Kelly it is harder and steel grey in colour. There also appears to be less pyritisation in the Kelly ores.

HISTORY

There are no known early references to the ore from this area being used in the production of iron but its abundance near the surface must have been noticeable at least to tinworkers who are likely to have been exploiting the locality. An adjacent field is known as Tinhill Copse and there are records of cassiterite being found with the hematite.

The first known reference to workings at Kelly is from the Wreyland Documents of 1797, which tell of the landowner one George Wills leasing to John Pinsent for a period of 21 years a certain mine of 'black lead or some other substance located about a quarter mile east of Kelly Cross' (Torr 1910). The 'substance' was in reality micaceous hematite and was probably mistaken for lead because of its soft and foliated properties. The iron became known as 'Devon Sand' when it was exported as pounce for the drying of certain writing inks in the early 19th century, prior to the invention of blotting paper. Although the demand for Devon Sand was brief, the mine was to see new life after 1879 when the excellent anti-corrosive properties of the mineral were realised. With major constructions being undertaken in shipbuilding and the railways a rust inhibitor was needed to protect the vast iron surfaces and it was found that micaceous hematite, when added to paint, had the necessary properties. Warships were coated with the paint and many large bridges, including the Royal Albert Bridge at Saltash. The material was so successful that the Great Western Railway was said to have insisted on using only the paint made with micaceous hematite from this area. The working was reopened by Captain W. H. Hoskings, a well-known Dartmoor mining man, who surprisingly is

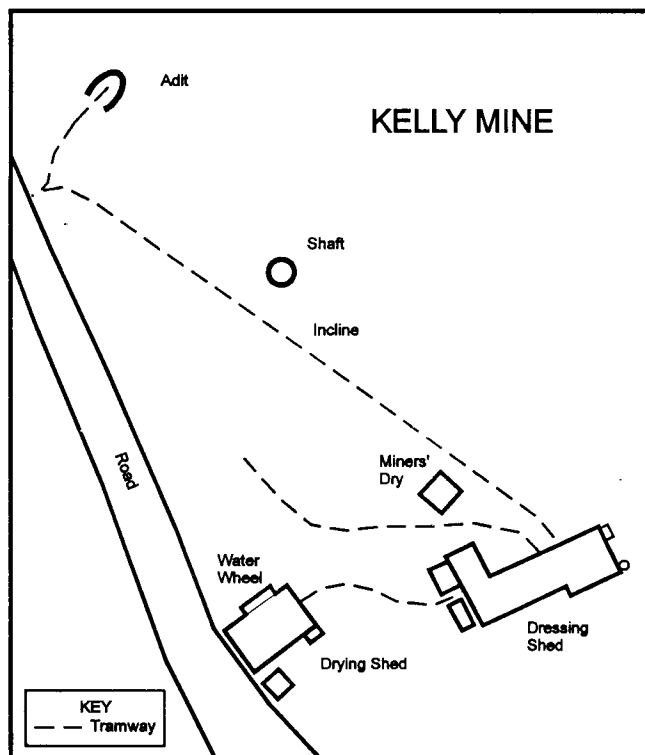


Fig. 2. Kelly Mine. Layout.

recorded as only employing three people. The ore sales during his period of control, i.e. up to 1891 were just over 300 tons.

The mine was advertised for let in the *Mining Journal* of 26th. November 1892 by a J. Dadd of Kelly. It was stated as containing several valuable lodes and being equipped with a water wheel and stamps for ore dressing. However, no one seems to have been interested and it was not until 1901 that the mine again reopened by the Scottish Silvoid Company, with a Mr. A. W. Govan as manager.

Govan operated the mine until it was taken over by the Ferrubron Manufacturing Company in the 1920s. Ferrubron already operated several mines in the area including Hennock or Great Rock Mine and the acquisition of Kelly gave the company a monopoly of the micaceous hematite supply. Mineral statistics appear to be only available until 1913 when 170 tons of ore were sold. At this time nine men were employed, five at surface and four underground.

The mine worked intermittently until the mid 1950s, with later mineral returns probably being combined with those of the larger Hennock or Great Rock mine.

PRODUCTION AND PROCESSING.

Although the following is an extract from a mining engineer's report of 1921, it is unlikely that methods would have changed much during the entire period of the mine's existence.

The mine was working on an E-W lode which dipped to the north. The lode was two to three feet wide, but the best portion was in the footwall or lower side, and between nine to eighteen inches wide. Of the three adits, only the middle one was working, a shaft sunk to the lower levels had not proved better ground or ore. The Middle Adit went in 150 - 200 fathoms on lode, then further connected to other levels with a raise and a winze. The working stope was reached by climbing, using a chain and rough wooden steps. The lode here was one foot wide and soft enough to recover by a pick. Ore was allowed to fall onto sacking, waste would be picked out and stacked in the stopes to build up the working platform to get to the ore higher up the stope. Two men were employed stoping and two driving the end and tramping.

Dressing the ore:

Ore was trammed out of the adit and up an incline to the mill. Here, large lumps of ore were crushed by small and light Californian Stamps, driven by a water turbine. The ore was then washed into settling pits. In dry summers when there was insufficient water, the fines and small lumps were broken by jets of water: a much slower operation, which reduced output (Barclay 1921).

After the process described above, the ore was dug out of the settling pits and trammed to a drying shed, where it was spread over the drying hearth. Due to the tendency for the particles to bind together on heating it was necessary that they be broken apart again into fine particles prior to being packed into barrels for transport down to Lustleigh station and onward transmission to the paint manufacturers.

KELLY MINE PRESERVATION SOCIETY

After the mine's final closure in the early nineteen - fifties

most of the machinery remained on site. Some parts of the plant were removed for use at Great Rock Mine which was continuing production but some were inevitably stolen from the site by thieves for either scrap or for personal collections. The site was well known to mining historians even to the point of articles being produced in local history magazines but all attempts to acquire permission from the land owner to preserve the remains were unsuccessful.

However, in 1984 attitudes changed and after long and protracted legal negotiations the landowner leased the site to three enthusiasts for the purpose of renovation. After the lease had been signed the help of the land owners was to prove invaluable in the restoration work and the society would like to believe that the land owners now have greater confidence in what the society is aiming to achieve.

An initial examination of the site was not encouraging. All the roofs of the buildings had collapsed, the remaining machinery was left open to the elements and all the tramway track and associated trucks had been removed. Naturally, the wooden leats and most of the water wheel had also rotted away. Beneath the collapsed dressing shed roof the Californian Stamps uprights had rotted, the Blackstone oil engine, the air compressor and the turbine had been stripped of all their attachments and brass bearings. The only building that looked serviceable was the crib hut or miners dry, but on closer inspection that too was seen to require re-roofing and attention paid to the walls.

It was obvious from the start that this was not going to be some 'quick fix' so ways needed to be found to raise money and enlist workers. A subscription society was founded and it was agreed to start restorative work immediately by organising

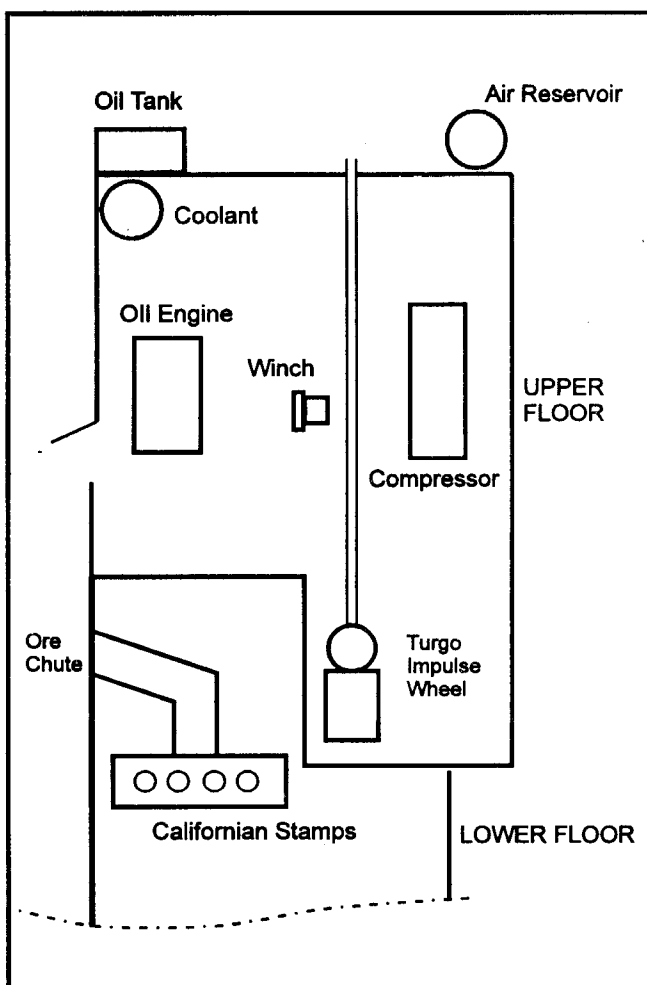


Fig. 3. Kelly Mine. Layout of dressing shed machinery (not to scale).

work parties on the first Sunday in each month. Applications for the assistance of Manpower Services were made but initial enthusiasm by them later turned to nothing and the group struggled along on small grants and members' subscriptions. Appeals were made to over fifty firms which had connections, no matter how remotely to the industry but positive replies were received from less than 10%.

The first task after completing the survey was to finish off nature's work and thoroughly demolish the sheds so that new supports and a replacement galvanised roof could be erected. The collapse had been so complete however that it had become difficult to work out the arrangements around the entrance and it was fortunate that contacts with people who had visited the site shortly after its closure led to a photograph becoming available to enable the society to make a true restoration.

This clearly demonstrated the great value of photography in restoration work. We had any number of photographs of the Californian Stamps, for which the mine had acquired a local reputation, but most photographers had ignored the buildings as just being uninteresting tin sheds and it was this that would have proved to have helped the most. In addition, the photographs show a hand operated jiggging box of which the society was completely unaware. After delving in the brambles, traces of it were still in evidence and nature's power to reclaim the land in the short time since the photograph was taken could only be admired. With the roof complete, the stripping of the machinery in the dressing shed could begin and an assessment made of the task of bringing the works back to life.

The most immediate task was the replacement of the stamps uprights, which were beginning to rot badly. This

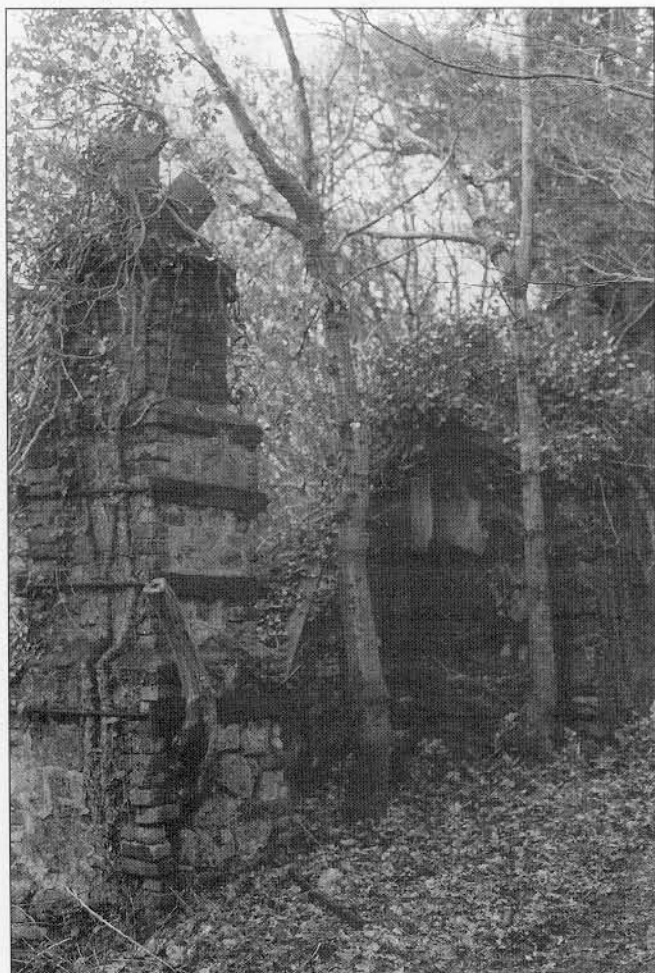


Plate 1. The drying shed in 1986.

involved a thorough stripping of the lifting rods and stamp heads before the replacement could begin. In another part of the shed the air compressor and the oil engine were being assessed and it quickly became obvious that where as the compressor could be refurbished reasonably well, the Blackstone oil engine would require a number of castings and fittings to bring it back to a reasonable state. It was soon realised that the society could not enter into this sort of expenditure at that time, as there were many tasks of a higher priority. Nevertheless we decided on a rather novel solution.

A complete replacement engine, as near to the original specification would be bought and when funds became available the original could be refurbished and the replacement sold, hopefully at a profit. In true mining tradition to raise the money for the purchase, shares were offered with the promise of high returns and an elaborate share certificate was produced. An engine of slightly less horse power rating was located on a farm in South Wales and with the shares selling like hot-cakes the replacement engine was soon ready to be transferred to the mine.

The refurbishment of the turbine also started and after many enquiries it became clear that the missing turbine cover was not going to be returned so the original firm of Gilbert Gilkes and Gordon Ltd. of Kendal, who are still trading, were contacted for help. Although they were unable to help materially they still had on their record books an account of the sale of the turbine to Kelly Mine. It appears that an original Gilkes vortex turbine from 1915 was replaced in 1920 by a Turgo Wheel Impulse Turbine (Registered Number 2867). They were also kind enough to supply working drawings from which a duplicate cover could be fabricated.

The power for the turbine came from a reservoir in the woods above but the connecting pipe-work was decayed beyond repair. By keeping his ears open one member of the group learnt that the largest clay extractor in the country had iron piping which was surplus to their requirements due to their intention to change to plastic in the future and that the society could purchase this at a reasonable rate. The pipe was duly purchased and after the erection of suitable supports, assembled at the site. On digging out the reservoir additional feeds and pipe-work were discovered which had brought water in from an adjacent valley to supplement the supply. This solved the enigma of how the turbine was kept going using only the small, main stream source.

In 1992 the society entered and gained second place in the National Parks Enterprise scheme which directly led to an application for a grant to roof the drying shed from Dartmoor National Park Authority. The application was successful and the materials were purchased to start this difficult task. The roof of this building had been constructed entirely from wood covered with layers of bitumen to aid heat retention. Work progressed steadily and was completed in early 1995.

After nearly ten years of the society's existence, in 1993 a chance meeting in a barber's shop led to contact with a man who had first-hand experience of working at the mine. All our questions could now be answered! Or could they? The examiner was able to give names of some of his colleagues who still lived around the area and these were duly contacted and brought to site to have their reminiscences recorded on audio tape. What we had not envisaged however, were the differences in their recollections, and their denial that certain processes were used and that particular pieces of equipment were at the site.

The workers seemed to have been allocated specific tasks



Plate 2. Restored drying shed water wheel and leat, 1996.



Plate 3. The dressing shed in 1986.

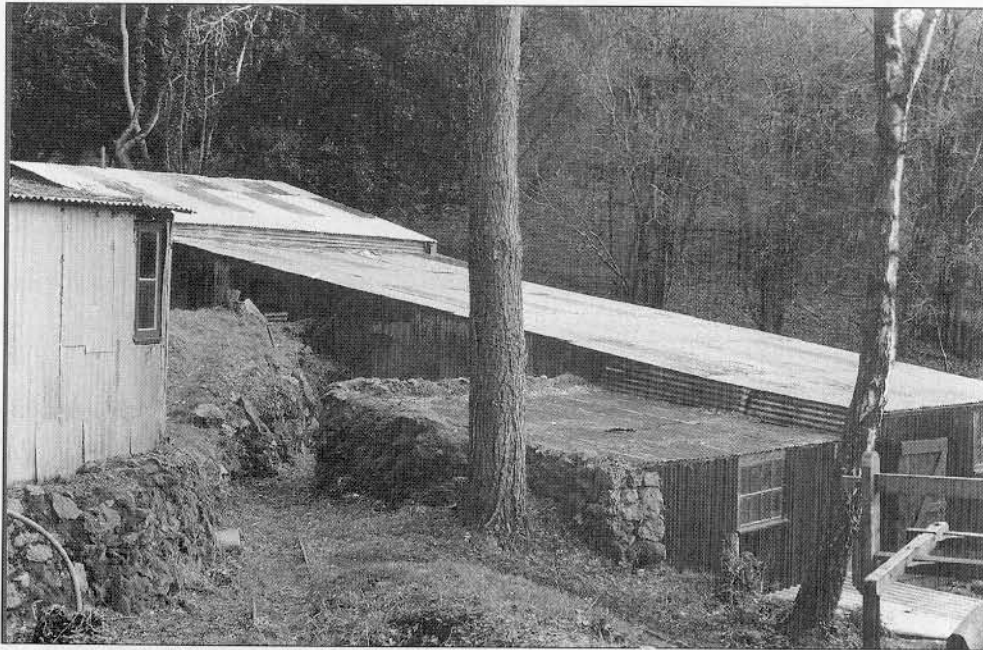


Plate 4. The restored dressing shed in 1996.



Plate 5. The tramway starts to mount the incline once more.

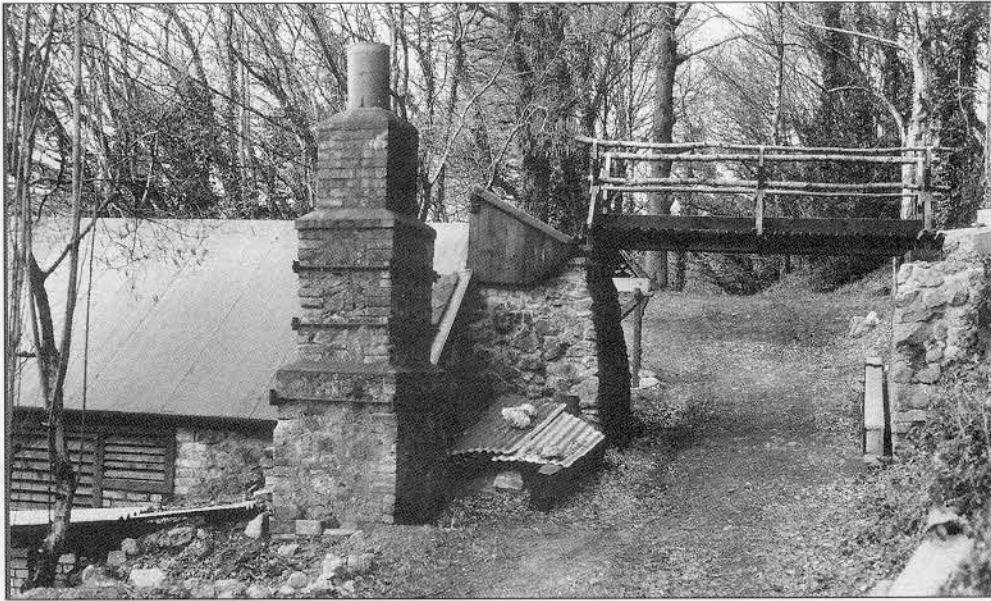


Plate 6. Restored Drying Shed, 1996.

and were often unaware of what was going on elsewhere in the mine. However, by careful selection of their memories, we were able to piece together some aspects of the last few years of the mine worked.

During these later years Kelly Mine was reopened by Messrs. Nichols and New who were working at Pepperdon Mine at West Wray Barton, near Moretonhampstead. Underground working was concentrated at the southern extension of Hawkmoor Mine which is only 200 metres south of Kelly Mine. The ore was trammed from the adit and transferred down a chute to a lorry below. It was then taken down the road to Kelly for initial cleaning and crushing. In order to allow a lorry up to the Stamps chute area the tramway rails and the bridge which carried the leat to the waterwheel were lifted. Finally, the ore was treated in a more modern plant at Pepperdon Mine.

The plant at Pepperdon was powered by electricity from the National Grid, a luxury Kelly never enjoyed. Blasting took place in the afternoon at 3.30 p.m. while the miners sat on a bench outside the adit entrance. All the shot holes were drilled by hand, although a mobile petrol-driven compressor was tried, and was found to be too expensive. This is probably the last instance of hand-drilling in this area. The explosives were stored in the miners' dry at Kelly and only the man responsible for placing the charges was allowed underground. The explosions were counted to ensure the charges had all gone off. In 1951 one such blast broke unexpectedly into some 'old men's levels' followed by a collapse from ground level. So great was the damage that it caused the closure of both Pepperdon and Kelly Mines.

CONCLUSION.

The first ten years of renovation at Kelly is over and much has been achieved with a minimum of funding. The immediate future looks assured with another grant from the National Park to re-construct the leats and tramways. A new lease has to be negotiated shortly and the society is constantly aware that as they approach the point where they are able to run the machinery for demonstration purposes, so they are in danger of becoming stifled in bureaucratic red tape. The miners certainly had their problems, but probably not much of that to contend with.

For details of membership of the Kelly Mine Preservation Society, please contact the treasurer, Graeme Spink at 10 Cardinal Avenue, St Budeaux, Plymouth, Devon, PL5 1UW, who will also gladly receive any contributions to aid in the continuing restoration.

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