

4. The Copper Mines of Renfrewshire

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This article presents an assessment of the 18th and 19th century copper workings in Renfrewshire.

The Gourock Copper Mines

Two trial mines were established on copper ore (malachite) present in pockets of calciferous sandstone, in the immediate neighbourhood of Gourock. The copper ore running between Lang Craig and Kempock was found by chance during trials for coal on the estate of Sir John Stewart, in 1767. A trial was made of copper ore and some 711.2 Kg were dug, which when processed gave 425.25 Kg of copper. The trial was not so successful as to encourage further ore working. The pursuit of coal was seen as more worthwhile as even though Gourock lay on coal export routes, the cost of local fuel was high.⁽¹⁾ The tendency to dismiss the find is shown further in the writings of John Williams, who afforded the copper workings barely a mention in his book, "The Natural History of the Mineral Kingdom", published in 1810.⁽²⁾

The Gourock Copper Mining Company

The Gourock copper ore hinted at potential for non-ferrous metal work and, uniquely, it was relatively close to coalfields which eased the cost of transport for smelting. Thus in the mid 19th century copper boom in Renfrewshire, Gourock once more attracted attention. The formation of the Gourock Copper Mining Company was mainly the work of share dealers keen to use the boom to personal advantage. The principal agent for the company was Thomas Molyneux, a well known local share dealer based at 27 Hope Street, Glasgow.⁽³⁾ The company secretary, George Oughterson, also had financial interests, and the pair of them began to build the prospects of the new company by arranging meetings and encouraging potential shareholders to visit the old copper trials at Gourock.⁽⁴⁾

Exploration of the 18th century workings took place during March and April 1862. Stalactitic formations of green carbonate of copper, variegated by occasional streaks of oxide of iron provided attractive incentives to the visitors. Things looked promising, and assay got 44% copper from the stalactites and 12% from copper impregnated rubbish. The rubbish contained a lot of abandoned mine fittings and tools from the 18th century explorations, hinting that the effort to get the few ounces of copper had been great. But when the tools were dipped in acid they revealed a stout covering of copper, impressing those looking on.

Ore recovered was generally erratic, varying from the size of a pea to the size of a man's fist and the copper varieties encountered were so-called grey ore, yellow, bell metal, horse-flesh and native copper. The term 'horse-flesh ore' which was Cornish in origin, hints at the presence of Bornite, which was a valuable copper ore.⁽⁵⁾

Possibly too, there were Cornish miners on site, though the main influx of Cornish miners to the Scottish Central Lowlands did not come for another four years or so and that was due to the failure in Cornish mining in the mid 1860s.⁽⁶⁾

Even with all the excitement shares got slow attention due no doubt to the debunking of the mine by the anti -copper-in-sandstone lobby. It was true that though the laminations in the sandstone showed a grey carbonate of copper which might prove productive, the working of it was neither easy nor cheap. But on a more positive note the trials of 1862 established that there was a layer of cupriferous sandstone 1.3716 metres thick in the area.⁽⁷⁾ The mine then became of sufficient interest to attract Nicholas Ennor and Captain Martin Dunn to the area and this encouraged a rise in the price of shares. Both men thought that taking the mine deeper would bring new

resources, and by popular account this proved true, with working costs estimated at 7.5 new pence per ton.⁽⁸⁾

Confidence was such that Messrs Hastie had erected a water wheel to pump the workings by April 1862. The reservoir for the water wheel was sited on higher ground with the local landowner, Major Darrack's agreement. Confidence was boosted further when Nicholas Ennor became managing director at a special general meeting held on 22nd May 1862. The man in charge of working the mine was Captain Young. Captain Martin Dunn for his part promoted the Gourock workings vigorously, stating that they were more promising than the workings at Alderly Edge. George Henwood in his writings on Scottish mining and copper in sandstone also expressed interest in the area.⁽⁹⁾

However, just as things seemed to be so promising, everything went wrong. The mine could not be worked profitably especially with the fluctuating market in metals. Within two years it was decided to wind up the activities of the Gourock Copper Mining Company Ltd., and this was done at a meeting on 2nd April 1864.⁽¹⁰⁾ The old workings got a brief lease of life some six years later, when the firm of Henderson tried the original workings about Drumshantie and explored a new mine at Larkfield. The two workings were carried on to December 1874 with increasing difficulty and certainly no profit. Messrs Henderson pulled out by February 1875. The workings were stripped of their fittings and equipment and the whole lot was removed to Irvine, and the rabbit hole workings abandoned.⁽¹¹⁾

Lochwinnoch

The town of Lochwinnoch nestles at the foot of the Calder Glen, gouged out since glacial times by the Calder Water. The glen is divided between steep slopes and sheer descents of perhaps 10 metres or more into the stream. The high mural crystalline cliff structures of a dull purple colour are intimidating and further up on still higher ground, the Crag Falls' long perpendiculars show only too clearly the ferocity of the action of ice sheets on the rocks of the area. The passage of the ice left many deep clefts, holding promise of opportunity to the early mineralists, notably promise of copper, which proved quite tempting around the Calder Glen.

Copper was found close to the old Calder Glen laundry, in and around Ravens' Craig and northward about the farmlands of Kaim, where quartz dolerite and a dyke with a little barytes and carbonate of copper seemed promising.

The Early Kaim Copper Trials

In the early 1830s William Orr, the proprietor of the Kaim, found copper during a survey of his estate. But it was not until 1846 that some English speculators arrived in the area and encouraged him to sanction exploration. Two lodes were, it was claimed, found and there was the possibility of more with one at least 558.8 mm thick, though this was probably a mis-represented coating of carbonate of copper across a cavity which was common. Coatings were also to be found along the rock joints of the area. Breaking equipment and dressing plant were brought in, and there was every expectation of success until the lack of good copper ore was realised.⁽¹²⁾ Whatever the failings of this poorly documented venture, the activities about the Kaim did not go unnoticed and throughout the next decades the area continued to attract parties to explore and make trials. Eventually a company was formed trading as the Lochwinnoch Consols.

The Lochwinnoch Consols

The company was one of two groups, perhaps three given the alteration of name to the Lochwinnoch Consols Copper Mining Company, under the Companies Act of 1862, which began to mine the Kaim area. To add another point of confusion to local mining

activity, Kaim itself was often spelt Kame, and this spelling was subsumed to identify the West Kame Copper Mining Company, also active at the time. The Lochwinnoch Consols enjoyed what appeared to be success and by March 1862 its engine house and chimney stack were a prominent feature in the copper district; whims were also erected for raising ores. In March 1862 90.424 tonnes of ore from Lochwinnoch was transported to Swansea, though it was not properly dressed as little had been done to build a dressing plant at Lochwinnoch. This so-called crushed ore was part of 406.4 tonnes of materials taken from the adit area and from a depth of 8.23 metres. The output of material hinted that the amount of pure copper was probably little compared to the effort expended at the adit and first level workings.

The Lochwinnoch Consols sought more money from its shareholders to finance operations, gambling on the full share price of £5 per share from those holding them).⁽¹³⁾ The gamble proved a mistake as a number of shareholders, not convinced of the Company's success, failed to pay up what they owed; and it was agreed at an Extraordinary General Meeting on 6th May 1863 that the Company be wound up. A Court of Session case on the liability of shareholders to pay with interest in default of initial payment was thrown out by the Court, and the enterprise foundered.⁽¹⁴⁾

The collapse of the Lochwinnoch Consols was typical of its time and such speculations were common sharehold business. It is interesting to note that Thomas Molyneux, already linked to the questionable workings at Gourrock, also offered business in the Lochwinnoch Consols.

In due course both interests failed but it did not stop Molyneux who gambled in West Kame with some success.⁽¹⁵⁾

The West Kame Copper Mining Company

In 1861, encouraged by the initial success of the first Lochwinnoch Consols group, Messrs Orr along with William Glen, the local farmer, began to explore West Kame, paying considerable attention to old workings and trials dating back to the 1840s. Much time and money were spent on securing the old shafts and levels in the old workings and trials and creating a mining base which was so successful that 47.752 tonnes of copper ore were raised. Though the ore was manually dressed for sale it fetched from £5.30 to £9.05 per tonne, which was very encouraging to the adventurers. Realising, however, that more money would be needed they set up the West Kame Copper Mining Company Ltd early in 1862. The Company had a capital of £6,000 divided as 1,200 shares of £5 each. The initial payment was £2 per share on allotment and the remaining £3 was payable in £1 calls at 2 monthly periods.⁽¹⁶⁾ The firm's directors were John Bell, Candleriggs, Glasgow; Robert Pollock, corn merchant, Paisley; Thomas Orr, Millbank, Lochwinnoch; William Glen, farmer, Kaim, Lochwinnoch; John Young, miller, Kilbarchan and Hugh Howie, iron merchant, Glasgow. The banking firm was the City of Glasgow Banking Company, and the consulting engineer was T Currie Gregory, Glasgow. Gregory fulfilled this function for several mining firms - notably the Glasgow Caradon Consols. The resident agent was Captain Cornwall Henwood, one of that diffuse clan of English mines masters.⁽¹⁷⁾ On 14th March 1862 the Company met at Lochwinnoch to read the articles of association, the bulk of the capital being represented by eighteen shareholders, who between them held 300 shares. The funds were administered by J Reid of the City of Glasgow Bank.

in March 1862 the carpenter's and smith's shops, mine office and ore dressing house were erected. The engine shaft was down to 16.46 metres and it was planned to drive a level from the shafts about 2 metres lower, which was to cross-cut the lode after driving about 20 metres.⁽¹⁸⁾ Mining and exploration of the West Kame continued throughout April and on the 8th and 9th of May T Currie Gregory inspected the workings. He reported that the West Kame Sett lay to the immediate west of

Lochwinnoch Consols and shared the same lodes. The ground rose at the west end of the sett to about 55 metres above the adit level of the Lochwinnoch Consols and Gregory saw this as advantageous for the draining of the West Kame mine. Gregory's comment suggests that the Consols were at that time still expected to succeed. The Consols' mine would only have acted as a drain once it reached the march line with the West Kame property. He described how it was possible to trace the main lode through the sett by the configuration of the ground, for within the containing basalt it formed a marked ridge. Where the lode was shallow it was claimed to be 4.8 metres wide, with good vein stones and beds of Grey Sulphuret of Copper which by May was being taken open-cast. The workings from the engine shaft, which was rectangular in shape and 3 x 2 metres in size were down about 20 metres and a cross cut mine was being driven as quickly as possible to meet the main lode. The cross cut mine was about 16 metres long and had already reached a branch of the main lode, which gave grey ore.

Gregory mentions that it was intended to erect an engine for the triple purpose of drawing, winding and crushing, and that it was further planned to power the western part of the mine using flat rods. A local stream was to be used for dressing adjacent to the planned crusher house.

Water was probably a major factor in the success and failure of the copper mines around Kaim. Gregory mentioned flooded old workings which had yet to be drained in May 1862 in order to work the remaining ore. The local stream which was so fortuitous to Gregory's plans and ideas had flooded that part of Kaim years before.⁽¹⁹⁾ Entries in the "Mining Journal" for this period suggest that the mining groups around Lochwinnoch had by then identified West Kame as the more likely to succeed. Though the mine at Lochwinnoch Consols remained active, any major work there ceased in order to concentrate at West Kame. This may suggest that the labour force involved was really quite small and was being used to best advantage to keep up the morale and confidence still entertained by a few of the adventurers.⁽²⁰⁾

Captain Cornwall Henwood added his voice to the promotional lobby, stating that a horse whim was being used on the engine shaft to push forward the work of driving and ore-getting as quickly as possible. He also said that a week's work on the back of the lode by two men had already got around 8 tonnes of ore. Henwood also identified the methods used for tracing the lodes by putting down pits and shafts across the sett. His self-proclaimed "Champion Lode" it was claimed, gave a "kindly copper gossan" and was productive as it increased in depth. Henwood believed the mine would become "permanently profitable for the shareholders."⁽²¹⁾ But Henwood and the others failed to interest the company shareholders. The Lochwinnoch Consols collapse so undermined the West Kame venture, that no matter what its promoters did, they could not inspire any confidence in that working either.

West Kame struggled on as a low-powered mining venture and got next to no press coverage in the investment and mining papers, though it was still active in the period 1869 to 1870. There was another burst of activity in the following decade and this is discussed below.

Calder Glen United Mines

When the breath went out of the Lochwinnoch copper boom there was a period of consolidation about the mid 1860s. At that time the Lochwinnoch Mining Company was formed; the agent was Moncrief Mitchell, who had been one of the promoters behind the failed Lochwinnoch Consols. The Calder Glen United Mines Ltd emerged on the back of this firm. It was made up of a group of adventurers who initially exploring the line of the Calder, extended their influence to the farmlands about the Kame. The firm promoted trials about Reikam Linn, the area of Cloverstone and the Glenward Hill, but not one of the trials yielded worthwhile results. The Calder Glen United Mines Ltd failed

and was wound up after a meeting to dispose of the properties on the 27th October 1865.⁽²²⁾

Copper Exploration Near Kilmacolm

When the Greenock and Ayrshire Railway built its line through Kilmacolm in the 1860s an extension of the so-called copper vein of Lochwinnoch was found during cutting work. Though it created some interest and was explored the metals proved so bad as not to be worthy of further attention. The Railway was later absorbed into the Glasgow and South Western Railway.

The Final Fling At Kaim

In May 1874 the Hamilton mining surveyor, John Quinn, visited the copper mine at Kaim and reported on its state to Robert Salmon of Rankinstone. Quinn painted a picture of a mine very much on its last legs which had failed to fulfil the promise of the area. The rectangular engine shaft was down at 58.522 metres. Divided into two parts by brattice work, the winding shaft was 3.048 x 3.048 metres. The pumping shaft was 1.219 x 3.048 metres, and it also carried climbing ladders. The total dimensions of the engine shaft were 3.048 x 1.829 metres. There were landings for the levels at 18.288 metres, 27.432 metres, 36.576 metres, and placings for a level at 54.864 metres, but it had not even begun. The final 4 metres or so was a water-logged sump not reached by the pit pumps, which descended in two flights - one to 18.288 metres and the other to 27.432 metres. The clack and suction did not work well and both the upper levels were flooded to a greater or lesser extent by water running down the shaft from the water system of the dressing floor which was too close to the shaft. Quinn gives the impression that as much water was running down the outside of the pit pumps as was being lifted by them. The adit workings for the same mine were to a depth of 9.144 metres.

The workings described by Quinn were regular and the adits and levels averaged about 1.829 x 1.372 metres. Unusually the miners followed a practice of chasing the lode with cross cutting back and forth and working by overhand stoping and backfilling. Quinn regarded the mining methods as totally inefficient and pointed out that much valuable ore was lost in the process. Even getting the dug ore to the shaft was not efficient for though the levels were wide enough to allow trams, wheelbarrows were used and the transshipment of ore to the iron kibble at the shaft damaged the hard won ores still further. Quinn pointed out that trammed ores, using one vehicle from face to surface, did not suffer the damage inflicted by the over-handling at Kaim. Furthermore the small ores were often thrown aside and lost; and according to Quinn these were often more productive in terms of the ratio of ore to stone. Quinn, indeed, suggested to Robert Salmon that an assay office be placed at Kaim to allow the regular testing of worked ores and thereby direct the miners to work those areas which were giving the best returns for their efforts. The impression given by Kaim was of a few hopeful miners flailing around in ground they did not fully understand, which given the geological nature of the area was hardly surprising.

The engine shaft was worked by a 25 hp multi-purpose steam engine, and winding was done with a flat hemp rope which may not have run all that well for the shaft head gearing was in a poor state. The engine also pumped through bell-cranks but, as already suggested had a good deal of difficulty in dealing with the influx of water.

Dressing of ores was poorly done and much was lost in the preparation probably owing to the over abundance of water crossing the dressing floor area and down the engine shaft. Even the preparation of ores on site with a small cupola furnace was badly done. Too much stone went into the furnace with the ore bearing materials and hence it could not work efficiently. According to Quinn the cupola furnace was often stopped for repair and too much fuel was necessary for the little work done. Kaim simply did not

pay the expense of working for it was so inefficient. A heap of slag near the road at Kaim is a reminder of a company who burned their profits away. ⁽²³⁾

Conclusion

Both Gourock and Kaim and the many trials around Lochwinnoch were examples of people travelling hopefully with the copper booms. The adventurers were at the mercy of the shareholders who quite clearly did not believe everything they were told. Copper in sandstone had such a poor press that their scepticism is not to be wondered at. The lack of investment is also seen in the poor technical infrastructure of the mines – e.g. the use of wheel-barrows when tramping would have been possible. Geologically the area could have been worked well with the sound infrastructure that modern technology would allow. Fortunately for a very nice part of Renfrewshire, Lochwinnoch's resident farmers are not prepared to believe present day adventurers about the value of mineral riches compared with that of open moors and farmlands.

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