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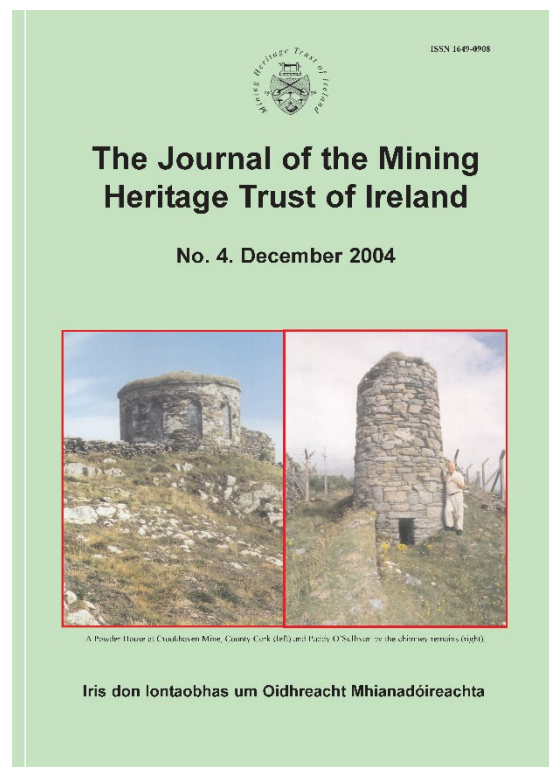
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HISTORIC RECORDS OF MINING ON MOUNT GABRIEL

By Stephen Briggs

Abstract: Mount Gabriel has been most associated with Bronze Age mining in relation to the shallow adits mainly west of the Barnacleve Gap road that runs east of the mountain (see figs 1 and 2). This examines the written evidence of copper and barite mining on and around Mount Gabriel from 1853 with a view towards establishing a context for these finds. *Journal of the Mining Heritage Trust of Ireland*, 4, 2004, 19-26.

INTRODUCTION

Primitive-looking stone mauls were first noticed by geologists on Mount Gabriel, near Schull, Co. Cork, in the 1920s. In 1969 Bronze Age charcoal was calibrated from the site, where 32 shallow open adits penetrate the interstices of ice-scoured rock faces, many of them interdigitated with shallow peat basins. Later excavations yielded similar dates (O'Brien 1994) leading to the proposal that the Mount Gabriel had been an important source of copper ore over 3,000 years ago. However, examination of 19th century accounts raises a number of questions about this.

The area around Mount Gabriel was known for its metallic minerals from the early nineteenth century - the prolific Colonel Hall had sunk a shaft here. It is mentioned in the *Mining Journal* during the 1840s, but no adits were mentioned at that time. The whole region was thoroughly surveyed by the Ordnance Surveyors and reconnoitred by geologists, but again without apparent record of ancient features. A survey in association with the sale of Mount Gabriel through the Landed Estates court in 1847 includes only the conventional mineral references: "All mines of Copper, Lead, Coals and Metals and Minerals on the lands of Clohane & Quorisk, Mountgabriel, Letter, and Knocknaclovane". (NLI MSS1846) Of these only Mountgabriel and Letter are relevant. The former townland embraces the very top and north of the mountain and as far east as Barnacleve gap with Letter on the other side of the gap. The townlands on the southern slopes where the adits are Skeag (which also had barite mines) and Rathcool though these are never mentioned

This leads to confusion of terminology as "Mount Gabriel" is used to indicate the mountain rather than the townland and sometimes seems to embrace Letter as well. Hence it is frequently impossible to tell where workings or trials had taken place in relation to the shallow adits. Therefore to convey as comprehensive a picture as possible of the 1850s and '60s operations there, extensive quotes are used from reports in the *Mining Journal*.

REPORTS IN THE MINING JOURNAL 1853-1860

In 1849, Mount Gabriel is mentioned by an anonymous correspondent styled ANGLO-CELT, who described all the minor

workings in the Crookhaven-Bantry area (MJ 1849 April 20th, p.199). He named fourteen local mines ('if workings they can be called'), which had been '*confined merely to scratchings on the surface*'. None of them were on Mount Gabriel (MJ June 28th 1849, 318) and he did not suggest Mount Gabriel either possessed ancient workings or was a particularly promising ore-field.

The first mention of any mining there appears early in 1853, titled '*LETTER MINE NEAR MOUNT GABRIEL. This I understand is about being put to work in a spirited manner by Mr. Sadleir who has acquired a lease on the property on favourable terms. It is on a good run of lodes*' (MJ 1853, p. 34, *Skibbereen Correspondent*). The title word "near" clarifies that this was indeed Letter mine, immediately east of the mountain. What was actually being mined is not stated.

Its product becomes clear in the next contribution: '*LETTER MINE (NEAR SCHULL)..[lay]..In the cross-cut extending south [where] a very rich lode has been discovered; the branch is from 6 to 10 in. [15-35 cm.] wide containing silver grey and peacock ore and splendid stones of malachite. Preparations are making for dressing with all dispatch. The mine is more than likely to become the pick of the district*' (MJ 1853, p.398).

This location did produce 27 tons of low-grade copper ore (under 4.5%) in 1855-56, total value £111.80 (*Min. Stats*) However, even before that, Letter was producing barytes in 1854, when "Our Correspondent in Dublin" stated: '*They are about sending off from Letter Mine a cargo of barytes, which is reported to be much stained with iron*' (MJ 1854, 671).

The location of the Letter barytes mine is given later and the existence of unworkable copper somewhere "over this district" noted '*Proceeding from Ballydehob to within a mile of Skull we turned off to the north towards the gap of Mount Gabriel. The view from the Gap is most extensive and magnificent.. [A] .. little beyond the gap we were pleased with our visit to the barytes works which are there established; we found extensive and perfect machinery erected and in operation for the reduction and manufacture of the barytes from its crude state ... We observed also while travelling over this district large quantities of the carbonate of copper; in many instances the slate rocks appear to be thoroughly impregnated with it, but the gangue, or vein-stone, being heavier than the carbonate, it has hitherto been found impracticable to cause a separation without losing the*

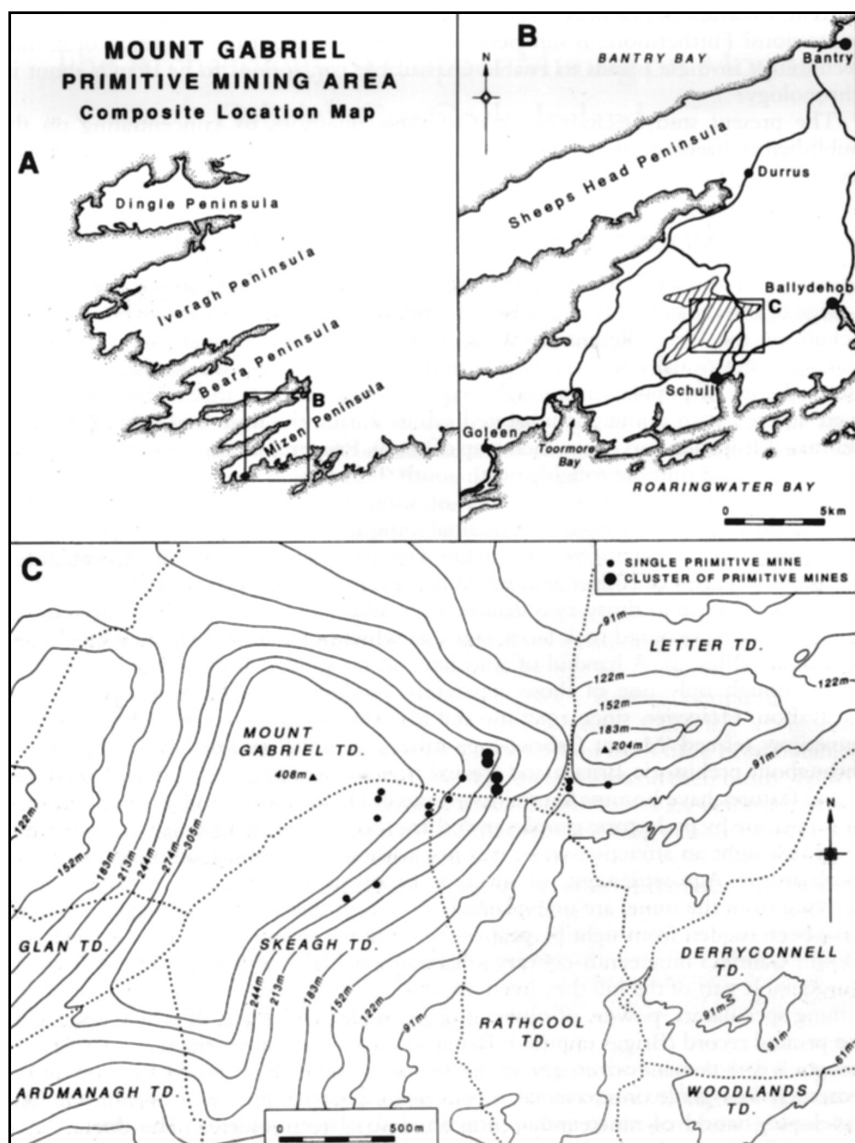


Figure 1. Map showing location of primitive mining sites in south west Ireland with location plan of Mount Gabriel. Reproduced with permission, from Briggs (2003), originally from O'Brien 1994.

greatest part of the copper' (MJ 1858, Rough Notes No.IV, p 764).

Nevertheless, a Mount Gabriel Mineral Company was established to work such copper in 1860. "Our Correspondent in Skibbereen" noted, on August 18th (MJ 1860, 565), that 'about two miles west of the [Ballydehob] cross-course, at Letter Mine, Mount Gabriel, the same run of lodes have been opened, and a valuable deposit of ore recently found in Hall's shaft, in that mine.' While he seems to place Hall's shaft in Letter which he thinks of as part of Mount Gabriel, the following week he relocates it to the north side of the mountain: 'Mount Gabriel mine .. due north of, and parallel with the Schull Bay Mines: the hill rises about 1360 ft. [c 415 m.] above the sea-level, and is penetrated by the same cross-courses. At the north side of the hill a discovery of copper was made about 40 years ago by the late Colonel Hall, which, until last month, remained untouched. Hall's shaft, however, has been cleared of water and rubbish, and the men have already raised a good pile of ore. The lode contains rich grey ore, carbonate of copper; black oxide, and native copper; and everything about it seems to indicate a large deposit of mineral'(MJ 1860, 580).

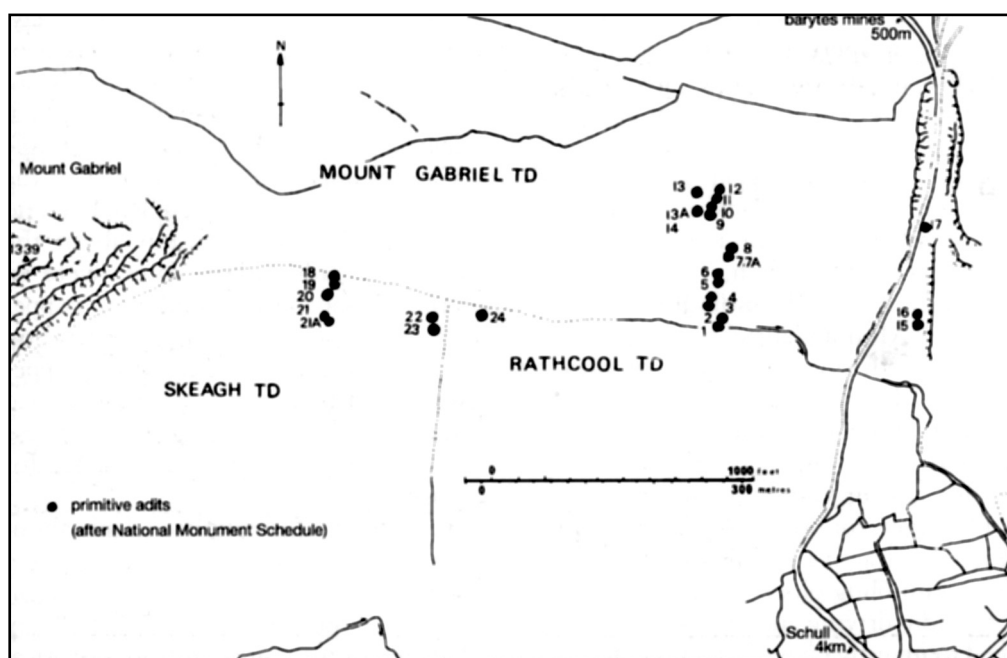


Figure 2. Mount Gabriel, plan showing location of numbered adits. Reproduced by permission from Briggs 1983.

The first comprehensive listing of much earlier mining in the area dates also from 1860. While the description of these older mines could fit the adits on Mount Gabriel, they are not specified and the article goes on to refer to the ancient workings further north. It is worth quoting in full:

'The North Ballydehob district takes in an extensive mountain range, and includes the barytes mines of Letter and Dreenalamon, and also the copper mines of Dreenalamon, Derrycarhoon, Gortnagrough, north and south, and Shronagree. This mountain range is about three miles north of the village of Ballydehob, and extends from

Mount Kid to within a short distance from Dunmanus Bay. In an east and west direction, a distance of eight or

ten miles, and varies in height from the sea level from 500 to 900 feet [c 230-285 m]. In many places in this mountain district are to be found workings for copper ore, which must have taken place at a very remote period, and consist of openings on the line of the lodes, east and west, from 26 to 60 ft. [c.8.0-18.0m] deep, and from 10 to 60 ft.[c. 3.0-18.0m] in length. The lodes where opened are from 2 to 6 ft. [c.0.6-1.8m] wide, and their walls are quite regular and smooth. And as not a trace of the lode stuff is anywhere to be seen at or near the surface of these old works, it would appear as if the whole contents of the lode had been removed, and, consequently, had contained sufficient mineral to pay for removing. These ancient works are attributed to the Danes, and known in the locality as "Danish Works," the excavations having apparently been made by the use of stone hammers, numbers of which have been found, and also other very curious implements, the use of which is unknown.

A piece of notched oak was found, supposed to have supplied the place of a ladder. These ancient works are to be found for many miles along the run of lodes in the mountains of Dreenalamon, Derrycarhoon, and Shronagree. Small cargoes of ore of good produce have recently been shipped from these lodes, from merely superficial excavations, and much good, no doubt may be done in this district if chemical knowledge is brought to bear on the ore contained in the numerous lodes and veins, as most of these ores superficially are thin laminae of carbonate in a soft killas rock, hence the necessity of some more economical mode of treatment than the usual one of dressing and concentration. It is absolutely impossible to put them to water without a heavy loss and probably the only effective plan would be to treat chemically this class of ores, which are found so extensively distributed throughout these mountain districts'

(MJ 1860, Sept. 22, p. 648, Our Skibbereen Correspondent).

COMPOUNDING CONFUSION

The Geological Surveyors of c. 1861 reflect the geological confusion which follows:

'Mount Gabriel Lodes - [are] Two miles North of Skull Harbour, and on the East of Mount Gabriel, there are a few small lodes that "show" copper, and a vein of sulphate of baryta. The latter was worked a little, and is shifted to the North by a North and South fault that lies where the new road from Skull crosses the ridge on the East of Mount Gabriel' (M.G.S.1861, 23).

The following year, a series of articles appeared in the *Mining Journal* chronicling mining developments near Schull, apparently referring to Letter mine but calling it Mount Gabriel: *'About 3 miles N. of the Schull mines, there is a parallel range of lodes, traceable through the mountains from Ballydehob to three Castle Head, and on the run of lodes Mount Gabriel Mine has been opened, a short distance east of the great cross-course, which forms the gap in the mountain. In this mine, numerous surface trials have been made on the lodes, some of which are of great width, and all of them inter-mixed with grey*

ore, carbonate of copper, etc. ... [which produces 5 per cent copper]. This mine may be worked for years by adit levels, and would at once produce an enormous quantity of low produce ores from the backs and stopes, and no doubt greatly increase in value, judging by what is being done in the district, in depth. It is surprising that more active operations are not being carried out on this promising concern. About 2 miles North of Mount Gabriel Mine, in the lie of the great cross course, a large deposit of sulphate of barytes has been found, and which is being worked in Dereenamolane'] (MJ 1862, 219).

Later, M. Francis *'visited .. Northward from Schull Bay over Mount Gabriel .. the site of some workings for barytes'* (MJ 1862, p.446). Not long after, the Journal's correspondent in County Cork gave another account of the Schull district but seems confused about the location of Letter. It is apparent that little work is being done there: *'About 3 miles N. of Schull Bay Mine, and about ½ m. E. of the gap of Mt Gabriel, which is formed by the great cross-course ... the Letter Mine is situated on the north. slope of Mount Gabriel. The mine has been at work, or rather a little doing in it, during the last 8 or 10 years. Operations are carried out by costaining, sinking shafts .. through beds .. up to 70 feet [c 20 m] thick, containing 3 per cent copper. A deep level may be brought in, which would drain all the copper lodes and the barytes to a considerable depth, and the mine might be worked for years without machinery, except a crusher for reducing the ore'* (MJ 1862, 511).

Although not explicitly stated in the *Mining Journal* during 1862, it seems to have been during that year that some copper ore was taken from Mount Gabriel. That Autumn, a correspondent travelled to Crookhaven through Dreenamolon and Letter mines, where there was *'little doing, .. the latter [mine] employing only five or six men'* (MJ 1862, 742). Activity in the Schull area was being well watched throughout the following year (MJ 1863, 195; 203) when, on April 11th Viator again drew attention to "Mount Gabriel" although he again seems to be writing of Letter. By that time

'on the run of lodes Mount Gabriel Mine has been opened, a short distance east of the great cross-course, which forms the gap in the mountain. In this mine, numerous surface trials have been made on the lodes, some of which are of great width, and all of them inter-mixed with grey ore, carbonate of copper, etc .. [which] produces 5% copper .. [it] would .. produce an enormous quantity of low produce ore from the backs and stopes, and no doubt greatly increase in value, judging by what is being done to the district, in depth. It is surprising that more active operations are not being carried out on this promising concern' (MJ 1863, 244).

Part-repetition of the earlier view, it again seems to demonstrate that trial adits were now widespread. Whereas he also states that the trials had been made *'on lodes .. of great width'*, their locations are not clearly indicated. However, the next account elaborates at much greater length and is important for helping locate the adits and describing contemporary processing methods:

'Four large east and west lodes have been partially laid open by shallow levels and the greatest perpendicular

depth does not exceed ten fathoms. [i.e. 60 feet or c 18 m]; from the north to the south lode is about 40 fms. [c 72 m] .. The four parallel lodes converge going west, and at, or about, the great cross course [Barnancleeve Gap], they are likely to converge and form one great lode. About 50 fms. [c 90 m] S. of the south (Hall's) lode there is a lode containing sulphate of barytes, quartz, iron &c. The ore from the lodes already opened, without any dressing, but crushed dry, produces generally about 6 percent of copper and about £500 worth has been raised and sold. The plan suggested for the proper and economical working of this mine is to drive a deep adit cross-cut from the valley below the present workings, to make a dressing floor near the entrance of the deep adit, lay down a tramway in the adit level, and to erect a crusher, to be worked by a water-wheel, for crushing the ore. The proposed adit level would intersect all the copper lodes 30 fms [c 56 m] deep, and the barytes lode 50 fms. [c 90 m] deep; a thorough drainage of water being thus effected, the different lodes could be cheaply explored east and also west, towards the great cross-course; and as the lodes, so far as they have been opened, (10 fms. [c 18 m] from surface), present unmistakable evidence of productive ores, there is reasonable ground to expect that they may be profitably worked for many years by the proposed deep adit level. The estimated cost to carry out the operations in this mine, and lay it open in a proper and miner-like manner, is £6,000. There is a small steam engine, which was erected on the mine some time ago, for working a stamps, stamping carbonate of copper and grey ore; however, it did not answer. There are offices and other useful buildings erected; and the cost of carriage from the mine to the pier at Schull would be about 2 shillings per ton. Taking into consideration the fact that the mines in the immediate vicinity of Mount Gabriel, which are being worked in depth, are all vastly improving, the deeper they are worked, it is really puzzling to think that a mine less promising than Mount Gabriel should go begging from the necessary capital to work it; but it is, and it is useless to deny that it is almost impossible to induce capitalists to invest money to work the mines, which are safe, bona fide speculations (MJ 1863, 332).

By July 1863, another mining journalist felt 'free to admit that' he was 'interested .. [in] .. the success of Skull Bay, Ballycummisk, Cappagh, Roaring Water, Mount Gabriel and every other mine in the district' (MJ July 18th, 1863, p.499). He complained bitterly 'of the system of bringing out Irish mines' (presumably meaning commitment to their investment potential or to poor local working conditions):

'I do not allude to any one mine in particular: for instance, a concern in which a few hundred pounds may have been expended, but upon which there is no machinery, not even a single stick, is picked up by a few knowing ones for a mere trifle' (MJ 1863, 499).

A much lengthier description of the area next appeared on

October 31st, 1863 (MJ p.786). This, the eleventh article by "Our Correspondent", quotes from reports by Henry James and an anonymous 'late agent', revealing much about past and anticipated workings on the mountain. It also clarifies that operations had not been confined to Letter townland but had also taken place on Mount Gabriel. Here, relevant phrases and sentences have been underlined and numbered in square brackets to facilitate discussion.

'For some time past there has been but little doing in Mount Gabriel Mine, in which there are several large and promising copper lodes; and although the mine has been partially opened in several places on the different lodes [1], the greatest perpendicular depth yet reached does not exceed 10 fms. from surface. Still these superficial workings [2], I am informed, have produced upwards of £500 worth of copper ore. This mine has been recently inspected by a well-known and highly respectable and intelligent mine agent-Capt. Henry James, of Redruth, Cornwall. I have been favoured with a copy of his report, from which I make the following extracts:-

"The stratum in which the lodes are embedded is a compact schist, near the surface, and standing nearly perpendicular, which created in me a very unfavourable impression at first; but after examining the lode and strata at a greater depth, I found a great change in both, the schist becoming much softer, and dips at about the same angle on the lodes, and my opinion is that when the lodes pass into this lower stratum they will become productive. There are four east and west lodes, which have been partially explored, all of which near the surface produce copper ore, and as they go west they appear to come together at a point near the great cross-course, which can easily be traced for several miles from Cape Cleer northwards, through the gap of Mount Gabriel to Bantry Bay [3]. I find by a survey made by Capt. W. Thomas, of the Schull Bay Mine, that by going back to the foot of the mountain 75 fms. an adit can be brought in 25 fms deep. I certainly should recommend this to be done at once, and at the same time that a shaft be sunk from surface to meet the point where the adit will take the lode. This work will probably cost altogether nearly £1000. and I fully expect in carrying out this work-the sinking of the shaft 25 fms deep-that sufficient copper will be raised to meet the expense of both the driving and the sinking, and will lay open copper ground that will leave a profit in the taking away after the shaft and the adit are communicated. This I believe to be the best plan of operations for thoroughly developing this mining property; and I did not hesitate a moment to recommend you to subscribe the above-named capital to carry it out. The produce of the copper is very good, as you will see by the assay made today - No.1, selected specimen, 54 per cent.; No.2, ordinary specimen from the lode, 24 per cent. A large quantity of the carbonate of copper is also found in the joints of the killas, and also in the lode, a little distance off from the richest part of the copper runs [4]: this will make a produce of about 4 percent. It

appears that some one interested in the mine fancied that by stamping and washing the carbonates, he would be able to raise the produce [5], but in this, as a matter of course, he was mistaken."

The following are extracts from numerous reports of the late agent:-

"We have a good lode discovered, and for want of more men we cannot break it. There is a large pile of ore at surface, in a rough state, waiting to be dressed, and very few mines present such prospects, with so little outlay. The lode is from 9 to 10 feet wide, composed of elvan, spar, light killas, carbonate of copper, and quartz, mixed with ore throughout, also containing branches of rich silver ore, from 2 to 4 in. wide. The deeper we are getting, the more solid the ore is, and the more abundant. We ought to get £10,000 for this mine, having the value in sight. It is a great pity there is not machinery on the mine to return the hundreds of tons of ore stuff, and dispense with costly hand labour [6]. It is the opinion of everyone here that it will make a good mine, and I am persuaded that my opinion will yet prove true, that this will make a rich mine, if vigorously worked. I am delighted to find the lode improve as we sink on it, which is a most important feature in a mine, and I believe I may say we are certain of success, and of having a profitable mine."

Now, making all due allowance for the probably highly coloured reports of the late agent of the Mount Gabriel Mine, yet when we read the report of a disinterested and experienced miner, like Capt. Henry James, is it not surprising that there should be any difficulty in obtaining capital to work a mine with such favourable prospects as are to be seen in Mount Gabriel? I do not wish by comparisons to disparage the mines of any district or country, but when we look at the millions of British capital lavished and lost in foreign schemes and bubble companies, it is really astonishing that capitalists will not look nearer home.'

Where exactly were the openings made on the different lodes [1]? It is unlikely that they were all in Letter townland but what is meant by a little distance off [4] It is uniquely upon Mount Gabriel that the outcropping killas joints [4] (clay-slate *teste* Arkell and Tomkeieff 1953, 66) of the Old Red Sandstone geosyncline are so well exposed (O'Brien 1994, Fig.8, p.20; Fig.20 p.43; Fig. p.14), and it is mainly within those joints that the 'Bronze Age Adits' are located.

The likelihood that adits in so obvious a place were already known to these advocates is further strengthened by quotation [3] which implies that, such as they were, the copper lodes on the west side of the Barnancleeve road had been at least partially explored. The disseminated nature of mineralisation within the rock, an inability to concentrate it mechanically, and the low percentage of mineral carbonate all suggest comparison with the adits.[5]. For purposes of comparison with the primitive or 'Bronze Age Mines', it is significant that extraction and processing had remained undeveloped, and that the ore was still being sorted, cobbled and carried largely by hand [2,5 and 6], a

fact which also accords with earlier regrets of how steam-driven ore stamping had proved unsuccessful. Could hand mauls have been used in this primitive dressing operation?

Thus it is unlikely that the Bronze Age adits were still invisible under peat by 1863 as the area had by then been exhaustively examined and written about. That they were not regarded as "ancient" seems borne out by a comment about those in the 'hills to the north of Mount Gabriel'

"The shallow workings of the "ancients" are readily observable around its abrupt elevations and in the deep declivities the miner of the present day can be found eagerly and hopefully searching for subterranean wealth. The ancient workings, which are most conspicuous on a range of high hills to the north of Mount Gabriel, and said to be Danish, can be clearly traced on the backs of a series of lodes that traverse the baronies of Dreenalamon, Shonaque &c.'" (Jukes 1863).

LATER WORKINGS

In 1867 John Taylor bought the rights of the defunct but undissolved Mount Gabriel Mineral Mining Company (established 1856) which he did dissolve the following year and established *Mount Gabriel Copper Mining Company* (BT31/7/46, BT31/1385/3873, BT41/464/2603). Its prospectus referred to the workings of mines in the townlands of Letter and Knocknaclovane, and not in Mount Gabriel, Skeagh or Rathcool (*MJ* 1868, 124; per O'Brien 1994, p.39). Therefore, presumably by that time, for copper at least, the superficial workings which had produced low-grade copper ore between 1862 and 1863 had been abandoned. So, although further work may have been done, no product is recorded.

In 1923 four barite lodes at Mount Gabriel are noted with adits from the north side of the hill (Hallissey). *Mineral Statistics* show 3500 tons worth £2,140 raised between 1894 and 1896. There was a gap of six years before production resumed under the Irish Barytes and Umber Company in 1902 and that operation continued until 1911 although only limited statistics are available. At greatest employment in 1904-'05 eleven were employed underground and seven on the surface. (Min Stats. "Mount Gabriel" 1894-1912). Around 1923, 'however, Holywell Standard Chemicals acquired the mineral rights of the townland of Mount Gabriel, with the intention of re-opening the mines to supply the raw material required at their chemical works' (Hallissey 1923, 18). Inquiries by the present writer in 1980 at I.C.I. Holywell (N.Wales), the company which succeeded Standard Chemicals, failed to produce any business records shedding further light on this transaction.

The barite workings on Mount Gabriel seem to have been confined exclusively to horizontal galleries penetrating the north side of the hill, away from or beneath occurrences of the low-grade copper ore, though, as has been noted, there were also barite shafts and pits near Letter Mine (O'Brien 1994, 43, Fig.20). However, in 1918 an attempt was made to raise barite in the townland of Skeagh by a Dublin company of Smythe, Davis and Tierney (Cole 1922, 21). What impact they made there goes unreported.

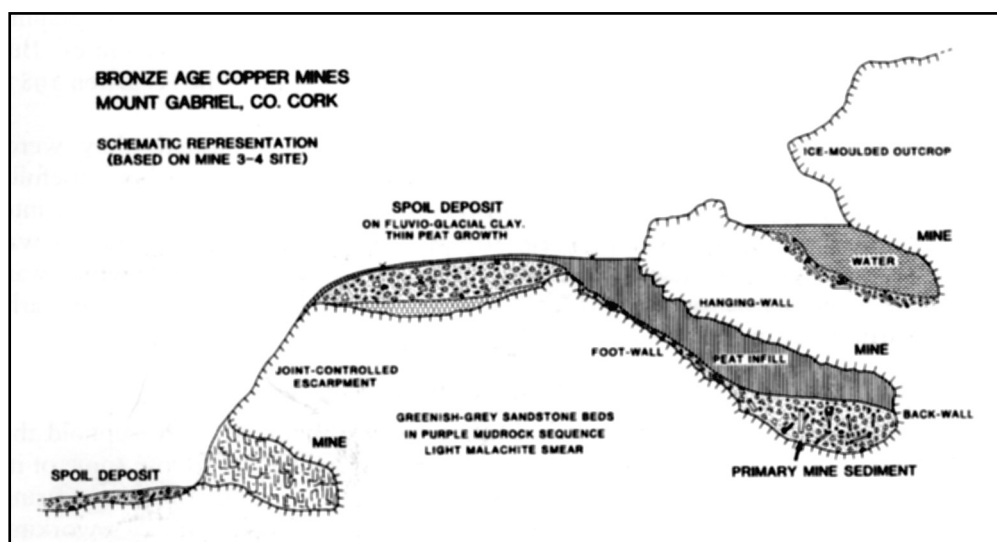


Figure 3. Schematic profile of a Mount Gabriel copper mine (based on mines 1-4. Reproduced with permission, from Briggs (2003), originally from O'Brien (1994) and O'Brien (1996).

315° through the spoil mound exposing spoil sediments of between 0.50-0.90 in thickness. Excavation of the western end of the trench [1995-97] uncovered a number of large angular stones near the extant entrance

to Mine 3. Removal of vegetation from the rock ledge above this debris revealed the remains of a weathered drill-hole measuring 25cm long by 4cm wide.'

According to local informants contacted by the writer in 1980, umber in sufficient quantity to make up a single boatload was extracted and shipped from the area during the 1950s or '60s. In 1984 attention was drawn to the survival of the almost unique nineteenth century barite crushing mill building on the coast east of Schull (Briggs 1984, 38). Important documentation relating to this was shown to the writer by Mrs Margaret O'Sullivan of Schull in 1980. Cowman and Reilly (1988, 135-6) add further useful details to this particular chronicle.

ARCHAEOLOGICAL CONSIDERATIONS

After a detailed re-examination of the formation processes, contents and stratigraphy of the Mount Gabriel mine adits, it has elsewhere been shown that their peat waterlogged contents are likely to be of dumped-in material, rather than represent a stratified cultural deposit of Bronze Age origin (Briggs 2003). Furthermore, the excavations themselves shed important light on three of the adits' nineteenth century histories.

The text of *Mount Gabriel* (O'Brien 1994, 330) accepts as recent those adits where rock-faces were apparently fashioned using metal picks, and it includes Mine 17 where 'the use of iron implements is confirmed by the broken rough appearance of the wallrock.' It also states that during excavations at Mine 27 in 1984, a site then accepted as Bronze Age, 'a number of pottery sherds was found in the upper 0.10m of the mine infill, c.2.50 m inside the entrance'. Unfortunately, its findspot appears nowhere on an excavation plan, and neither are the sherds illustrated. These appear to have been of post-Medieval type, but the suggestion that they had belonged to 17th century herdsman obliged to shelter in the mine (O'Brien 1994, p.355) hardly seems credible.

But the most significant piece of evidence for a post-Medieval presence on the hill is introduced under the heading *Site Disturbance* (O'Brien 1994, pp.74-9).

'Field survey in 1983 revealed an old trench outside Mine 3, previously recorded by Duffy as a "small drainage channel" (Fig.33; Plate 24). This narrow cutting measured 4.0m long by 0.7m wide and was driven

Trenching and shot-holes are characteristic features of 19th-century mineral exploration practice in this region; activities which often had serious implications for the survival of primitive mines. The occurrence of such features outside Mine 3 suggests that limited exploration work was carried out at this site within the past 200 years. The digging of a trench through the spoil mound provided samples of mineralised rock, and the detonation of a powder charge would have revealed fresh outcrop exposure. Debris from the blast, which fortunately was not very substantial, infilled the western end of the exploration trench partly blocking a narrow opening in the infilled entrance to Mine 3 which may also have been dug at this time. It was probably decided to abandon the site due to dissatisfaction with the ore grades exposed in this work. Stratigraphic confirmation of this short-lived episode of mineral exploration is provided by the entrance infill succession of Mine 3. Upcast sediments from the digging of this trench were exposed as well as blast debris which disturbed the upper levels of peat infill in this mine.

The excavator then goes on to state 'No documentary records are presently known relating to the date of this activity or the identity of those involved' and to suggest 'that the trial may date to a frenetic period of exploration in the Mizen Peninsula/Roaringwater Bay area during the first half of the 19th century, of which the workings in Letter townland to the immediate north-east of Mount Gabriel are a good example.' It is further emphasized that nineteenth century operators were not interested in the 'low-grade sedimentary mineralisation on this mountain', or their activities 'might ultimately have threatened the entire primitive mining complex' (O'Brien 1994, pp.78-9).

This is an altogether remarkable statement, particularly in view of the area's history as documented above, as neither this, nor previous accounts of this excavation (O'Brien 1987, pp.51,62; 1990, Fig.7, 284) are accompanied by any clear indication of the relationship between the shot-firing hole and the

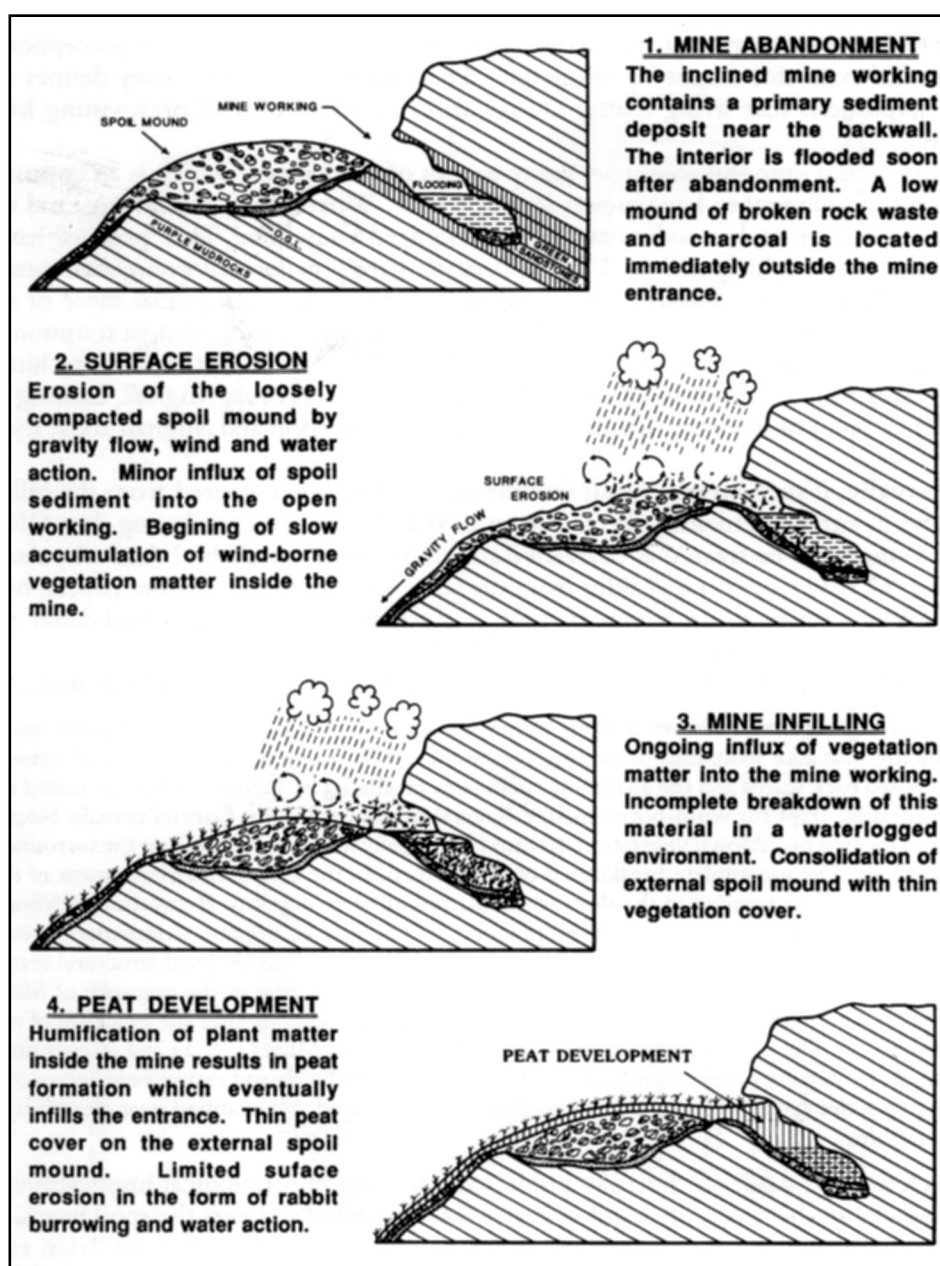
Figure 4. Post abandonment history of a Mount Gabriel copper mine. This interpretation based on climate dessication. Reproduced with permission, from Briggs (2003), originally from O'Brien 1994.

'prehistoric' adit. Interestingly, on a visit in summer 2002 the present writer was able to observe that it is positioned directly above the 'prehistoric adit'. Viewed close to, it is difficult to see how the adit could possibly have been excavated before the shot-firing had already removed the cliff-face overburden. The generation of a 3-D model of the adit and of its immediate environs would now best assist comprehension of how the adit was created, either dispelling skepticism or helping confirm the excavator's interpretation.

DISCUSSION AND CONCLUSIONS

As noted here, excavation has demonstrated nineteenth century activity in three of the adits on Mount Gabriel. Furthermore, re-appraisal of the peaty fill taken from the main excavated adit shows it more likely to have been dumped in, rather than to have accumulated over time (Briggs 2003). So although the vegetation history from local peat suggests at least some Bronze Age activity in the area, at present this cannot be correlated with any strata excavated within the adits. Further, in spite of intensive reconnaissance during two or three decades, Bronze Age settlements or smelters, or any metal products are still not known from the site or its locality.

In recent discussions favouring an interpretation as Bronze Age mines, it has been argued that the excavated adits are too crude and exploit too low-grade a mineral even to have been of interest in historic times. Supposedly sophisticated nineteenth century deep-shaft extraction has been emphasized in contrast (O'Brien 1994, *passim*), though there are only two such shafts at Letter Mine. Interestingly, however, descriptions of the mid-nineteenth century workings chronicled here indicate a primitive, rather than a developed industry. For instance, the *Mining Journal* mentions costaining twice (1860, 797; 1862, 511); and there are nine references to 'scratchings' (1849, 218), to 'shallow levels' (1863, 332), to 'superficial' (1860, 648, 797; 1863, 786), to 'surface trials' (1862, 219; 1863, 244) or to 'surface workings' (1849, 218), as well as to 'surface produce' (1863, 786) all on,



near or around Mount Gabriel. The reference to 'copper ore .. raised from almost the very surface'(1863, 537) is also significant in this regard. Triphook (1855) also noted '*numerous mines, pits, and open casts*' in the area. The *Mining Journal* records many other examples of 'shallow workings' in West Cork during this period.

Contemporary nineteenth century accounts of unmechanised ore cobbing in southwest Ireland are at best vague. The difficulty of separating out local carbonate ores from veinstone around Mount Gabriel was explained in the *Mining Journal* in 1854 (as noted above). As a matter of general practice '*in mines of a decidedly sulphury or pyritous character .. stamps are not applied, but the halvans are carefully gone through with the hand hammer*'.. [and].. '*cobbing is done by boys*'(MJ 1837, 57). Furthermore, in discussing lead processing generally, John Henry Pepper (1869, 243) explained how '*powdering of ore is done by ancient arrangement of stampers, which corresponds with the pestle and mortar used in every apothecary's shop for*

levigating small quantities of hard substances'. His account of cobbing copper ore (p.27) actually illustrates primitive-looking hammers, though their material is not explained. It is argued elsewhere that in Britain and Ireland economic conditions in several metal mining fields probably favoured the use of stone cobbing tools until as late as the 1880s (Briggs forthcoming).

That primitive conditions prevailed in the Schull area into the 1860s is indicated in a local newspaper. Here, in 1861, at the very time that Mount Gabriel mines were being promoted for copper extraction, one journalist lamented how '*Owing to the inclemency of the season, the turf was floating in the bogs, and the bog wood which formerly kindled that turf, was lying there also, so that the poor man when he returned from his labour had not sufficient fire to cook his scanty pittance of food*' (Anon.1861). Two other issues arise from this. Sodden bogs were capable of flowing into open adits and kindling or "spills" of wood such as those found in these adits could equally have been washed in.

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