

Great Expectations, Bad Geology: Edward Head and the Keelbottom Freehold Copper Mines 1872-1902

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The history of mining is a struggle between optimism and disappointment. Mining history books are full of stories of mines that failed, mines which wasted money, mines which generated very little income and made no profits. A glance at any historic mining map in Australia during the last 200 years will show numerous claims and leases but examination of company records reveals relatively few successes. Most venturers will have become disillusioned and moved on within days or weeks, or months. However, for a mining investor to persist with an unsuccessful mine for more than three decades is unusual, to say the least.

If few people have heard of the Keelbottom Freehold Copper Mines, west of Townsville in North Queensland that is probably because they never produced any copper. They are remarkable for two things - first their curious orebody, and second the unswerving devotion of the company's principal, Edward Head, who poured capital into the mines in five or more episodes over thirty years, only to produce nothing at all.

The Keelbottom copper mines might be seen as a triumph of optimism over disappointment, except that there was never any triumph, simply dogged persistence in the face of repeated failure. While the motives behind Head's extraordinary behaviour remain unclear, the most likely explanation is simply that his optimism was much greater than his knowledge of geology. He was seduced by the abundance of green stones raised from the mines, and in the face of his own experience and all expert advice, went on believing that they contained a copper bonanza.

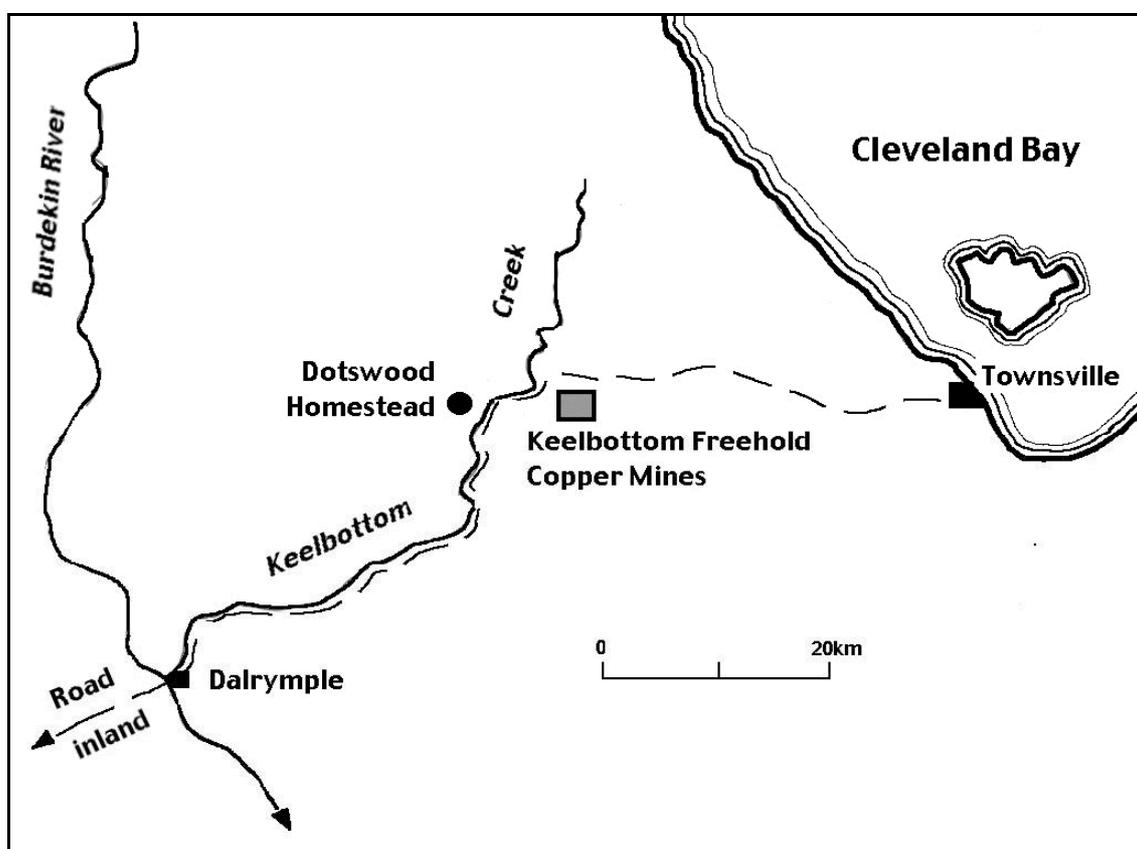
Background to the mining venture

The Keelbottom mines are located about 50km west of Townsville, within the Townsville Field Training Area owned by the Australian Defence Force. They are close to Keelbottom Creek, a tributary of the Burdekin River, and about nine kilometres north-east of Dotswood homestead. Their surroundings today form a complex historic site, consisting of the remains of a number of underground copper mines, a hotel, a

stone wall and domestic buildings, the whole spread over an area of about three square kilometres and occupied intermittently from at latest 1867 until about 1932.

European settlement of the district commenced with the founding of the government administrative centre of Bowen on Port Denison in 1861, and pastoral settlers spread out through the hinterland. The entire district was taken up for sheep and cattle grazing within two or three years, although at first it remained dependent on the distant port of Bowen. Dotswood station was stocked with cattle in 1863, and was continuously occupied for beef production for the following 137 years.

Map 1: Sketch plan of Townsville district, showing Keelbottom copper mines



Source: The author.

In 1864, agents of Robert Towns established the private port of Townsville in Cleveland Bay, and Dotswood became one of the closest properties to the new centre. To serve the pastoral settlers of the district, the government township of Dalrymple, North Queensland's first inland town, was laid out in September 1864 at the junction of Keelbottom Creek and the Burdekin River. This gave Dotswood a new significance, as road access to the hinterland was originally west from Townsville through Thornton Gap, and down Keelbottom Creek to Dalrymple. A hotel was built at Plum Tree Creek

(now known as Coppermine Creek) on this road in 1867, and the surroundings were surveyed as the town of Boolangalla in 1872.

Dotswood station might have remained the principal access route from Townsville to the Burdekin River and the western plains, had not the Queensland government erected a toll gate at the foot of Thornton Gap and begun charging a fee to road users in late 1867.¹ To evade the toll, the carriers detoured south to cross the range at Reid Gap, and pioneered a new route approximately along the route of the modern Flinders Highway and the railway to Mount Isa. The toll was lifted within a year, but the opening of the new road hastened the decline of the town of Dalrymple. In the next few years the discovery of gold at Ravenswood and Charters Towers near the new route inland confirmed its ascendancy, and the Keelbottom Creek area became a backwater for the next century.

The Keelbottom Copper Mining Companies

The first significant mineral discovery in North Queensland was gold, found on the Dotswood run in 1865. It was called the Star River rush, although the early discoveries were in fact made beside Keelbottom Creek. The goldfield never amounted to much, but it inspired prospectors, who over the next six years discovered in chronological order and increasing level of importance the Cape River, Ravenswood and Charters Towers fields. Copper ore was also discovered early in North Queensland settlement, first on the Einasleigh River in 1865, and then in a number of other places in the eastern ranges. By the 1870s two small copper prospects, the Kennedy and the Great Northern, were being investigated on the Star River, about 50km north-west of Keelbottom Creek.² There were regular newspaper references to copper in the Townsville hinterland from 1867 onward:

We saw some really magnificent samples of copper ore on board the Boomerang on Thursday last, containing a very large percentage of native copper. We hope that the district may benefit from this enormous treasure, and that when this mine is opened the development of other sources of mineral wealth may proceed at no tardy pace.³

This early reference to native copper is intriguing in the light of later events, but infuriatingly the journalist did not say where the samples were from. It is likely that they came from the Cloncurry region in the far west, where a Melbourne syndicate was

investigating copper prospects. The copper deposits at Keelbottom Creek were first mentioned in the press late in 1871, with a report from a Townsville correspondent:

About four tons of copper from a new mine not far from Townsville, called the Keelbottom Copper mine, arrived in town today, some specimens of which, kindly forwarded to me, are of exceeding richness. The ore is to be sent to Newcastle NSW, to be smelted, and great expectations are entertained.⁴

Activity at this site continued into late 1872, when what was described as a 'large quantity of solid blocks of copper ore' was brought into Townsville, having been mined from a 25 feet [7.6m] deep shaft sunk on the Keelbottom copper deposit. The journalist optimistically predicted that the mine would be very rich, as the specimens resembled 'those obtained from the celebrated Lake Superior mine'.⁵ The mines had been opened to investigate rich specimens of native copper (that is, pure copper metal) found in alluvial soil, not associated with any outcropping rock. This is a very unusual mode of occurrence for copper, analogous to the alluvial nugget form in which gold and other precious metals are sometimes found, and it was presumably the appearance of native copper in the specimens that reminded observers of the ores from the Keweenaw Peninsula of Lake Superior, where that was a characteristic form of copper mineralisation.⁶

The precise location of the 1871-72 copper deposit is still in doubt. While 'Keelbottom' was specifically named as the locality, it was almost certainly not the same place where mining was concentrated in later years. Government Geologist Robert Logan Jack later visited the place where these specimens were mined, and described the abandoned diggings as close to the town of Dalrymple. However, the later freehold mines were over 30km to the north-east along Keelbottom Creek, a short distance from the 1872 town site of Boolangalla. It seems to be no more than coincidence that the town was surveyed close to the later centre of mining activity.

Nothing much seems to have come of the first reports of 1871-72. When Jack visited the district at some time in the late 1870s in the course of compiling the first geological description of the Townsville-Charters Towers region he found an abandoned and flooded shaft at the earlier copper mines, and was shown specimens which he described cautiously, even sceptically.

On the east side of the Townsville road, near Dalrymple, opposite Mount Keelbottom, an east and west ridge of pale quartz porphyry, with clear quartz

blebs in a highly silicated felspar matrix, is intersected at right angles by a vertical joint or vein. A shaft has been sunk on this vein and some valuable copper ore is said to have been raised. I have seen massive specimens of native copper and carbonates in the hands of gentlemen interested in the mine at the time when it was last worked. When I visited the place the shaft was standing nearly full of water, and I could only find some specimens of malachite (carbonate) and chrysocolla (hydrous silicate).⁷

This was not a promising start, and the story of the Keelbottom mines was about to launch into a recurring cycle of hope and despair, as mining activity proceeded in five or six distinct episodes over the next thirty years. In November 1879 the first company was floated to work the Keelbottom mines. The Keelbottom Copper Mining Company Ltd was registered in Melbourne with nominal capital of £30,000 in one pound shares to acquire 240 acres of land at Keelbottom from Edward Abraham Head of Sydney. Head, the vendor, was to be paid a nominal £6,000, half in shares paid up to only 4 shillings, and half as a royalty on future sales of copper. All the shareholders were from Melbourne.⁸

Edward Head of Sydney was a commission agent with varied interests. He had previously been a prominent businessman in Townsville, licensee of the Exchange Hotel in the 1860s and Mayor in 1878.⁹ He had apparently been interested in the Keelbottom copper mines since the first publicity of 1871-72. This was not Head's first mining venture; in 1870 he had attempted to establish an ore crushing mill on the Ravenswood goldfield, requiring mine owners to guarantee his investment, as they had done for earlier mill owners. But he had left his run too late, for the field already had enough crushing mills, and the miners were no longer interested in guarantees.¹⁰

The press provided more details about the hopes of the Keelbottom Copper Mining Company. A Townsville newspaper carried the further information, quoted from the Melbourne *Age*, that the ore was said to assay an astonishing 58.2 per cent copper, with some gold and silver.¹¹ Nothing happened in the short term, and this first company simply vanished, eventually to be struck off for failing to lodge returns.

A new company was registered the following year, effectively a reconstruction of the old one. The New Keelbottom Copper Mining Company Ltd was formed in Melbourne in December 1880. Its objects, capital and agreement with Edward Head were essentially identical to the old Company's but the most substantial difference was that many of the new shareholders were merchants and mining investors from Brisbane, Townsville and Charters Towers.¹² The motivation for this change is unclear: it may be

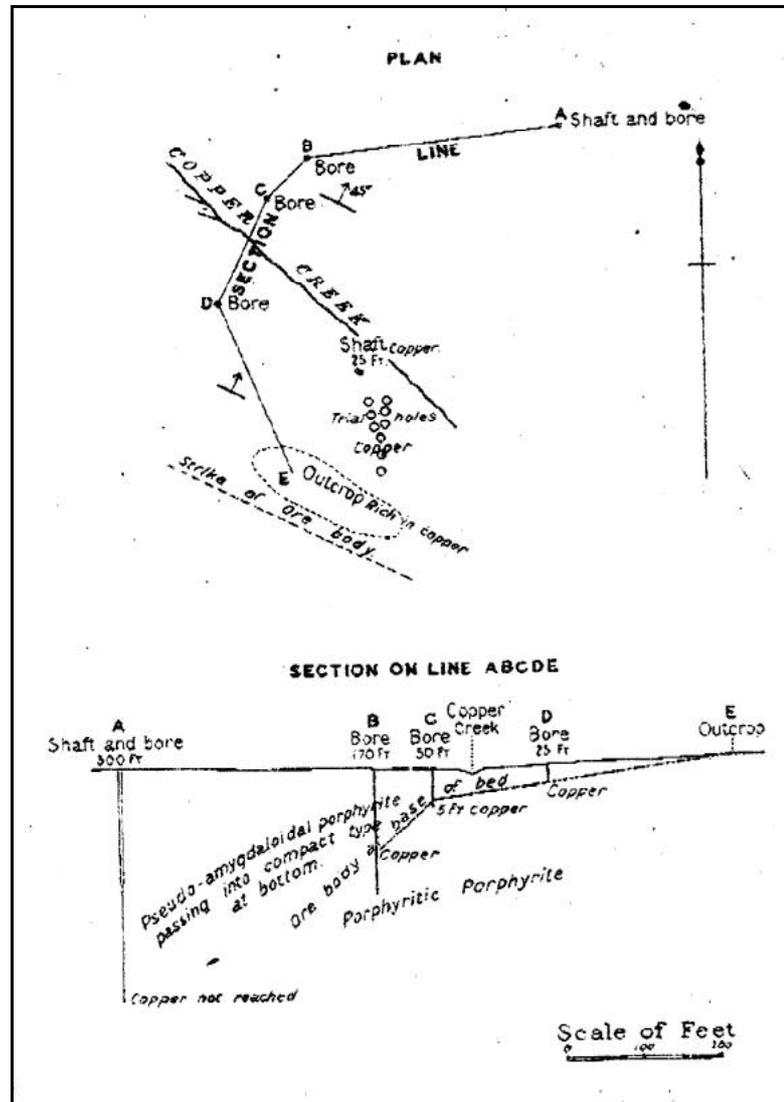
that Head's old business associates clamoured for a share in his company, or that he wished to bring them in with him.

Whatever the circumstances were, they soon changed, for this company too was short-lived. Two years later in November 1882, the Great Keelbottom Copper Mining Company Ltd was registered in Sydney. This time the capital was only £7,500 in one pound shares, and Head's reward as vendor of the freehold was to be £300 in cash, 3,450 fully paid up shares, and the balance as a royalty on copper sales. The articles contained a provision that in the event of the company's failure, the freehold would revert to Edward Head. There were no Victorian or Queensland investors.¹³

This third company actually went to work at the copper deposit. In 1883 the Ravenswood mining warden reported that a shaft had been sunk and machinery installed at the Keelbottom copper mines. 'A very powerful 10-inch pump is required to keep down the water in the shaft which is being sunk in search of the lode'. The pump was powered by a 6hp steam engine, and the whole plant was valued at £500.¹⁴ From this time onward, activity was certainly concentrated at the Boolangalla site, close to the Plum Tree Hotel, for that was where the freehold land was purchased, and the evidence on the ground there can be closely related to the warden's reports from 1883 onward. The following year the warden reported that two distinct lodes had been traced, and several more shafts had been sunk. The Sydney company was identified as the one financing the operation - it was never explained what had happened to the Victorians - and a more powerful engine and winding machinery had been purchased. The mining field had a population of only eight.¹⁵ The licensee of the nearby Plum Tree Hotel apparently had little faith in the copper mining boom, for during this stage of the mines' development the hotel closed, the publican undoubtedly being also disheartened when the railway reached Charters Towers in 1882, and traffic on the old road virtually ceased.

Adjacent to the 1872 Boolangalla town survey, a new township of ten large allotments and a camping reserve was surveyed, probably in 1883. It appears in some documents as Coppermine or Copperton. The mines, on the southernmost of these allotments, were known as the Keelbottom Freehold because Head had taken advantage of provisions in the *Mineral Lands Act* 1872 which allowed miners to purchase their property outright. This had advantages over a mining lease, which imposed conditions on the number of miners who must be employed, and the value of development to be done annually.¹⁶

Map 3: Plan and section of boreholes at Keelbottom mines from one of the company's prospectuses, probably for the Great Keelbottom company. Note that the boreholes in the 'section' do not form a straight line.



Source: G. Card, 'The Occurrence of Copper at the Dottswood [sic] Mine, Queensland', *Records of the Geological Survey of New South Wales* 5, 1897, p. 42.

There was difficulty in interpreting the geology of the field, and it was uncertain whether the formations discovered were in fact copper-bearing lodes. In 1886 Head installed a diamond drill on the field at a cost of £1,700. He spent six months putting down two bores, one 300 feet [91.5m] deep at the pumping shaft, and the other 100 feet [30.5m] deep.¹⁷ The results were inconclusive, and further tests were done over the following two years, but then a lull in activity followed. Developments at Keelbottom Creek were not generating any excitement in the Mines Department; in August 1886 Robert Logan Jack, who had described the copper samples so sceptically seven years earlier, rode along Keelbottom Creek on his way to inspect the silver mines at

Argentine. He described the geology of the district as he travelled but did not bother to visit the diamond drill sites, which were only a few hundred metres off his route.¹⁸ Activity on the site faded out by about 1888. In 1893 the department's annual report described the Keelbottom Freehold as 'dead and unworked, and I am afraid likely to remain so'.¹⁹

The warden had seriously underestimated Edward Head's persistence. In 1894 he was back, with another enthusiastic story for the press, and another rise in the ore grade of his prospect:

Mr E.A. Head returned from a visit to his copper mine on Keelbottom Creek on Thursday evening with very convincing and substantial proofs of the extent and richness of the lode, of which he is the fortunate possessor. The property consists of 240 acres, which has been Mr Head's freehold for 20 years The ore is literally held together with pure native copper. Every piece appears to be permeated with the metal, and Mr Head states that that the samples will yield between 70 and 80 per cent Great credit is due to Mr Head for his unswerving perseverance and enterprise, in the face of many difficulties, in prospecting the lode, and whatever wealth may be realised by him in the future he will well deserve. He left Townsville for Sydney on Monday, and there is little doubt that in a short time matters will be arranged for the development of the lode on a very large scale. A property such as this will certainly never be allowed to remain idle.²⁰

By 1895 a Mr Hodges was employed at the mines as resident manager and engineer, and three or four miners were at work diamond drilling and sinking shafts. The warden estimated that in nine years, £14,000 had been spent on diamond drilling, but he believed the lode had not yet been found.²¹ The campaign failed again, and the Keelbottom Freehold went silent once more. In 1896 machinery worth £10,000, including the diamond drill, was removed from the mines and sold to a Townsville syndicate that was prospecting for coal near Cooktown.²²

But the story was by no means over. The turn of the twentieth century saw a sharp rise in the price of copper; all over the world mining investors were galvanised into action, and there followed an even more ambitious effort at raising capital to work the Keelbottom copper mines. Head formed a fourth company, the Dotswood Freehold Mining Company No Liability which was registered in Sydney in 1900. The name Keelbottom had gone, but the capital investment was much greater. The other directors were R.J. Want MLC and A.J. Gould MLC, both Sydney lawyers, parliamentarians and mining investors. Gould was a prominent shareholder in the Great Cobar Copper

Mining Company. The company's nominal capital was £200,000, of which £125,000 was issued to Head in the form of vendor shares.²³ A small township grew near the mines in 1900, large enough to have its own Receiving Office for mail, named at first Keelbottom, then within a few months changed to Boolangalla.²⁴

An article in a Charters Towers newspaper in 1900 by 'an Occasional Correspondent' reported on these events, giving a colourful but not very accurate account of the mines' history, naming the owners at that time as Head and someone called Reid, and the mine manager as H. Roberts, formerly of the Cobar mines. The article described a scheme to raise £500,000 capital in London to work the field, which had fallen through when the London promoters became too greedy. Instead it recounted that the Sydney syndicate had bought the Freehold, and were at work developing the property. The correspondent breathlessly reported that a rich seam of gold had just been discovered near the copper! New plant had been brought from Sydney and from the Black Jack mine at Charters Towers, including winding and pumping machinery, rock drills and air compressors; a three-chambered shaft was already down fifty feet [15.3m], an ore crushing plant was being erected and a waterjacket blast furnace was planned: 'At present everything is bustle and brick-dust'.²⁵

Not all the dust in this story came from bricks. It is difficult to tell how much of the report was true, how much was genuine over-enthusiasm, and how much was designed to boost the price of Dotswood shares. Unfortunately there is no other description of the developments at the Freehold in 1900; the warden knew something interesting was happening at the copper mines, which were about 100km away from his office in Ravenswood, but he could only complain peevishly that no-one had sent him any returns that year.²⁶

There certainly seems to have been a period of substantial development at the mines, going beyond exploration and actually preparing for production. We know from geological reports that a shaft was sunk to a depth of 40-metres, and five tons [5.9 tonnes] of ore samples were raised from a number of trial shafts and sent for assay to the Sulphide Corporation's smelters at Cockle Creek near Newcastle. There was 5 per cent copper in one sample, but only traces in the others - very discouraging results from what were presumably picked samples of promising ore. This was the final crisis; the investment of more capital had produced no better result than before. The treatment plant at the mine began crushing, but stopped after a week; the copper values in the concentrates were 'not up to expectations'.²⁷ Work must have persisted on a small scale

for the next two years without anyone wanting to disclose the outcome, for in 1902 the warden reported, 'At Mr Head's Freeholds ... operations are going on steadily, but I can get very little information of a definite nature from that quarter'.²⁸ That report marked the end of mining at the Keelbottom Freehold.

These published reports describe five or six episodes of activity related to the Keelbottom mines, spaced over about thirty years and costing tens of thousands of pounds. First in 1867 there was the native copper from an unknown site. Then in 1872 a mining episode somewhere at Keelbottom Creek produced samples of native copper, but probably did not happen at the freehold mines. In 1879 and 1880 came the formation of the two Melbourne companies, but apparently nothing happened at the mines. Fourth, between 1883 and about 1888 there was shaft-sinking and drilling at the freehold by the first Sydney company, followed by about seven years of silence. More shaft-sinking and drilling took place in 1895-96. The sixth and most energetic period of activity was from 1900 to 1902, when the second Sydney company equipped the mine for ore raising and treatment. The saga was made possible only by Head's freehold tenure; if he had held a mining lease it would have been ordered forfeited about 1889 for non-compliance with labour conditions. But all the activity on the freehold properties between 1883 and 1902 produced only traces of copper.

The warden's report of 1902 was the last reference to activity at the Keelbottom Freehold Copper Mines in any contemporary documentary source, and it seems that operations finally ceased sometime in that year. The Sydney company was wound up before 1907. The whole futile exercise had spent something like twenty or thirty thousand pounds in an obsessive chase after minute specks of copper, with no return whatever.

Edward Head died in Sydney on 25 March 1916, and is buried in the Anglican cemetery at Waverley.²⁹ His will specifically placed the Keelbottom freehold in the hands of his trustees and empowered them to continue mining operations:

as regards the land situate in the District of Kennedy in the State of Queensland of which I may die possessed ... my Trustees may carry on any mining operations thereon that they may think fit ...³⁰

The trustees did not resume mining, but they kept that option open. Another 16 years would elapse before the mining plant was removed from the freehold, and the site was finally abandoned.

In 1932, during the Depression gold mining revival, companies on the new Cracow gold field in central Queensland were installing equipment at their mines, and the Keelbottom mines appeared briefly in the press again:

The Huntingdon crushing plant and mining machinery, which includes a diamond drill, a compressed air rock drill, of the Keelbottom copper company, which has been lying idle since about 1909 on Dotswood, has been purchased by Mr. J. Berry, diamond drilling foreman at Charters Towers, and will find its way in the next week or so to the new Cracow goldfield on which the attention of all Australia is focussed at the present time by reason of the extremely rich find made there. The mill, which is reported to need little reconditioning, is equal to 10 head of stamps, and is capable of crushing 30 tons [15.6tonnes] of stone every day.³¹

A much later geological report of 1944 confirms that the Keelbottom mines were kept on a care and maintenance basis until as late as the mid-1930s: 'Although no work has been done since 1901, it was not until about ten years ago that a caretaker was withdrawn and the buildings and machinery disposed of.'³² The Boolangalla Receiving Office had closed in 1907.³³ The Coppermine Camping and Water Reserve was abolished in 1939, and included in the surrounding Dotswood pastoral lease.³⁴ The pastoral lease and the Boolangalla Freehold allotments were acquired by the Commonwealth of Australia for defence training purposes in 1993 and now form part of the Townsville Field Training Area. Cattle grazing ceased in 2000.

The site today

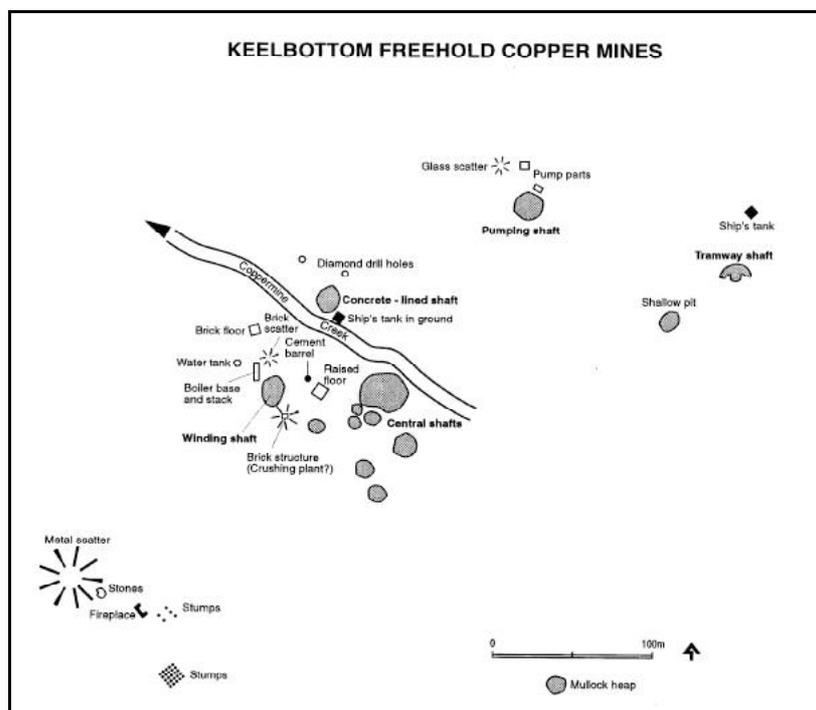
The physical evidence of the Keelbottom Copper Mines extends over an area of about 200m by 300m, straddling Coppermine Creek. Unusually for an underground mine site, the ground is level alluvium, and there are few traces of natural rock outcrops anywhere except where they have been exposed in the creek bed.

About 14 mine shafts can be identified, scattered very roughly along a line running from southwest to northeast. Areas of past mining activity are plainly visible from a distance, because much of the sub-surface rock on the mullock heaps is a silvery-grey colour, which contrasts with the surroundings. Four shafts appear to have been of substantial depth, have relatively large mullock heaps, and some are associated with evidence of machinery. Most of the other shafts are shallower, and some are merely surface pits.

The principal evidence of mining activity is concentrated within an area about 100metres-square on the south bank of Coppermine Creek. There is a large mullock

heap associated with a caved shaft which has been equipped with a steam winding engine. A brick boiler bed and stack base run north from the shaft, and a pit with machine bolts *in situ* aligned with the shaft shows the location of the winder. There is no trace of the headframe foundations. Also in the vicinity are brick floors and foundations, and timber posts from a substantial roofed industrial building, which would have housed the Huntingdon mill. This shaft and its surroundings are almost certainly the main area of activity in the final mining campaign of 1900-02.

Map 2: Plan of the Keelbottom copper mines site, 1996



Source: The author

About 50m east of this shaft is another extensive complex of eight or nine shafts and mullock heaps. In the mullock heaps of the deepest shaft here, and that of the winding shaft, there are stones with minute traces of copper carbonate ore visible in the forms of both malachite and azurite. In many of the same stones there are larger and much more conspicuous bands of an olive-green mineral, probably epidote.

North of the creek there are three principal shafts, dispersed in a rough line running northeast for over 200m. One open shaft with a substantial mullock heap is equipped with the remains of a Cornish pump. The rising main (vertical water pipe) of the pump is still in the shaft. It appears to be about 10 inches [25cm] in diameter, and this is probably the shaft which was fitted with the first pump of 1883. The pipe is most

unusual in being of wrought iron, not cast iron. Water pipes of this kind were normally cast in one piece, but this one has been formed of wrought iron plate rolled into a cylinder and riveted down the joint. The flange for connecting it to the next pipe has been fabricated as a separate piece and riveted on.

Figure 1: *Specimen from a waste dump on the Keelbottom copper mines, 1996. This piece shows both the epidote, which is found abundantly in the stone on the dumps, and a rare stain of azurite (copper carbonate).*



Source: The author.

The pump's wind bore (the strainer at the bottom of the rising main) is lying near the shaft, broken into three pieces. This has also been fabricated by rolling and riveting, with each hole individually drilled in the iron plate. About 20m north of the shaft is the cast iron cover or inspection plate from one of the valve chests on the rising main. These parts are all consistent in size, and are undoubtedly from the same pumping mechanism. No pumping parts are evident at any of the other shafts on the mines. There is no sign of the engine that powered the pump, or the boiler which provided steam.

This suggests that the pump was driven by a mobile engine that stood on wheels and could be towed away without leaving any trace behind. The small size of the engine (6hp) reported in 1883 would be consistent with a mobile engine.

There are other shallow pits in the vicinity. These shafts north of the creek give the general impression that they have been abandoned longer, and that they probably represent the early period of development at the Freehold, in the 1880s. The pumping equipment would have looked very primitive by the turn of the century. The shafts south of the creek have more and fresher evidence, and were probably the scene of the 1900 revival. The machinery installed in this area was newer and used for only a short period, and has all been removed.

Two hundred metres southwest of these shafts there are two house sites and other evidence of habitation. The foundation of a brick domestic fireplace and a set of timber stumps, probably part of a tankstand, clearly mark the remains of a house, and it is tempting to assume that this was the home of the mine managers - Mr Hodges in 1895 and Mr Roberts in 1900. Thirty metres southeast of them is a larger set of timber stumps in five rows of five, marking the foundation of a 6m square elevated building, perhaps a storeroom. Both buildings were aligned parallel with the allotment boundaries. There are an axle and other metal parts of a wagon in the vicinity, and a pile of diamond drill cores. This site gives the impression it may have been occupied for some decades after the mines closed.³⁵

What did Head think he was mining?

There is a small body of geological literature describing either the Keelbottom Freehold copper prospect or its fabulous native copper specimens, but the evidence linking the two is problematical. No-one ever seemed to be able to describe both the site and the specimens with authority.

The 'magnificent samples of copper ore ... containing a very large percentage of native copper' aboard the *Boomerang* in 1867 are of unknown provenance³⁶, and the 'massive specimens of native copper' that Robert Logan Jack saw clearly came from another site.³⁷ An 1887 reference to 'large masses of native copper' at Keelbottom apparently derives from Jack's description of the Dalrymple specimens.³⁸

There is no doubt that there are minute traces of copper present at the freehold mines, but their mode of deposition was for long unclear. The ground surface is recent

alluvium, but at only a few metres depth there are a variety of igneous rocks, the altered remnants of old lava flows, some of which are amygdaloidal: that is, they contain small cavities caused by gas bubbles when the rock was in a molten state. The geological consensus is that the small amount of copper present has intruded through faults into these cavities.

An early geological description of the field by New South Wales government geologist George Card reproduced a cross-section drawn by the company which showed a steeply-dipping 'orebody' revealed by diamond drilling. The trend of the lode was based on only three shallow bore holes which had found traces of mineralisation at different depths, and someone in the company - one immediately thinks of Edward Head - had joined the dots to convert three points randomly scattered through horizontal strata into an orebody dipping to great depth. That depth was confirmed by the fact that a 300-foot [91.5m] deep borehole in (roughly) the direction of the dip had found no trace of copper! Card's report concluded instead that 'there is no true lode present', and first proposed the theory that traces of copper mineralisation had been deposited through veins, forming native copper in the amygdaloidal cavities, and now oxidised to carbonates in the veins themselves.³⁹ But his report refers to 'a little native copper' not 'massive deposits', 'magnificent samples' or 'large masses'.

A more recent description of the freehold mines supports that earlier assessment in broad terms, noting that copper mineralisation is confined to quartz veinlets, and concluding that 'the rocks themselves are in no way cupriferous', and 'no evidence can be seen to support the idea of a wide distribution of copper, in metallic or any other form'.⁴⁰ Exploratory drilling at the site in 1975 found 'minor native copper mineralisation was encountered in fractures and veins conformable with the bedding but not of enough thickness to be of economic interest.'⁴¹

We are left with several problems here. Head gave astonishing estimates of 58 per cent, 70 per cent and 80 per cent ore grades, and to back these up, provided native copper samples from somewhere on Keelbottom Creek, which were described by reliable witnesses in the nineteenth century as 'massive', 'magnificent' and 'large'. But in the twentieth century, the copper samples from the freehold mines have been described by all observers with words like 'minute', 'a little', 'minor' and 'traces'. We do not have to think for very long before concluding that (a) Head was in the habit of grossly and persistently exaggerating the ore grades of his mine, and (b) the early native copper specimens probably came from somewhere else.

Was it a fraud?

Was it fraud? Perhaps. Certainly some aspects of Edward Head's behaviour look very much like those of a fraudulent mine promoter. He was clearly in the habit of marching into provincial newspaper offices and delivering impressive speeches designed to boost the value of his company's shares. He was the only person who believed there was a copper lode on his land, in the face of all the evidence. He repeatedly showed people impressively rich native copper samples which he said came from his prospect, but no-one else ever found any similar copper there. It is likely that he was seeking to promote his mine on the basis of samples from another site. There was a suspicious vagueness about the transfer of operations from Dalrymple to Boolangalla between 1872 and 1883. And Robert Logan Jack, an experienced judge of both minerals and miners, clearly had no time for Head or his samples.

On the other hand, fraudulent promoters do not usually persist in peddling the same property for thirty years, or going back repeatedly to explore in the same place. They may try to convince investors that they have 30 per cent ores, but not 80 per cent ores. Nor do they have any motive to urge their executors to go on mining in the same place after their death. Head gave every sign of being genuinely convinced that a fortune in copper lay under his freehold allotments. We know of five separate attempts at company formation: two in Melbourne and one in London that mysteriously fell through, and two more successful ones in Sydney, one of which did most of the investment in the final phase of mining. That fifth company included both prominent investors and experts from Cobar, one of Australia's great nineteenth century copper mines, so Head was certainly not seeking to target gullible or inexperienced people.

In any case, what was in it for Head? It is known he spent at least £20,000 exploring the Keelbottom prospect, and a large proportion of that must have been his own money, for he seems never to have had much success in raising capital from others. Nor as far as can be seen did he ever make any return on his prospect. From the documentary evidence, he received a few hundred pounds in cash, a lot of very doubtful vendor shares, and royalties on the copper that never materialised. The most intriguing unanswered questions are (a) did he sell any of his vendor shares, and (b) if so, how much did he receive for them? At the company float in 1900, he or a company in which he held an interest received shares nominally worth £125,000. Did Head succeed in selling any of this interest? The company share register does not survive, so we do not

know what transactions followed. We also do not know what company rules governed sales of vendor shares, or whether any shares were ever traded on the market, let alone what value they reached. But vendor shares are only of value on a booming market, and as nominal shares in a No Liability company that never produced anything except publicity, we can deduce that Head's interest would have been very difficult to sell. In addition, Head's fellow-directors were experienced investors, lawyers and parliamentarians, who would be unlikely to let him get away with anything as simple and squalid as 'flogging' worthless vendor shares to their detriment. It seems unlikely that it was a scam on Head's part; too many ingredients are missing.

The most plausible explanation for this extraordinary story of mis-directed effort is that Edward Head genuinely believed that he was on the verge of discovering a copper bonanza, and he went on believing this for 30 years. Why else would he ship five tons of selected ore samples all the way to Cockle Creek, only to be told they were worthless? He showed people samples from his Dalrymple prospect to demonstrate what he was about to unearth at the freehold mines. All the evidence surrounding the Keelbottom Freehold mines suggests that Head, rather than being the author of a cynical scheme to dupe investors, was himself a victim of naive optimism. He mis-read the evidence in the shafts, in the drill cores and in the very soil at his feet, and saw copper lodes and high grade ore wherever he looked. No-one else ever saw them.

It is apparent that Head could see something at Keelbottom Creek that no-one else could, but what was he seeing? The explanation may simply be that Head had faith in the green stones; the classic sign of copper mineralisation recognised by amateur prospectors everywhere on the earth's surface. Wherever Head mined at the Keelbottom Freehold, he found olive-green stone. Most of his behaviour becomes explicable if he believed - in the face of all geological advice - that what he was looking at was copper ore. Unfortunately, they were the wrong green stones.

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Endnotes

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