TAMAR VALLEY
INDUSTRIAL HERITAGE
a survey

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jointly funded by the
Australian Heritage Commission
and the
Queen Victoria Museum

1984

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R. Clarke (attr.)
Lefroy
c. 1896

Contents

INTRODUCTION

The industrial development of the Tamar valley, was based largely on a variety of mining activities along both sides of the Tamar river. This report discusses these activities at Beaconsfield, Lefroy, Back Creek and Bangor between first settlement in 1804 and the early part of the Nineteenth century.

Mining by its very nature is finite and so the settlements that develop about these activities also had to be short-lived unless alternative functions are developed. Beaconsfield grew from an overseer and two men at the limeworks in the early nineteenth century to about one hundred men working at the British and Tasmania Charcoal Iron Company in 1877 to the third largest town in Tasmania in 1880s as a result of the gold boom. Since the closure of the gold mining the town has continued as an agricultural and transport service node and commuter dormitory centre. Lefroys fortunes and population came and went more than once and at Back Creek between two minor gold booms slate was worked and is again today. An indication of the gold booms and depressions until 1914 can be gleaned from Appendix B.

Although these industries may have been significant on a state basis as was the iron smelting they all proved to be transitory. Today, in general, very few physical remains of the industries are extant. Building materials were valuable and recycled whenever possible, in only a few instances did the building defeat the attentions of their demolishers. Similarly equipment such as boilers, and stamp batteries moved from site to site. Even the shafts and other works were lost by subsequent re-working or re-development of the fields.

Today there are only a few substantial industrial structures associated with mining in the Tamar valley still existing. Pre-eminent of these are the shaft head buildings and boiler house of the Tamar Mine at Beaconsfield, the reduction and chlorination works of this mine and the furnace remains of the Ilfracombe Iron Company. These structures are listed separately in Appendix A. These together with other buildings, engineering works and quarries associated with the wide variety of mining activities undertaken in the valley are discussed within the text of the study.

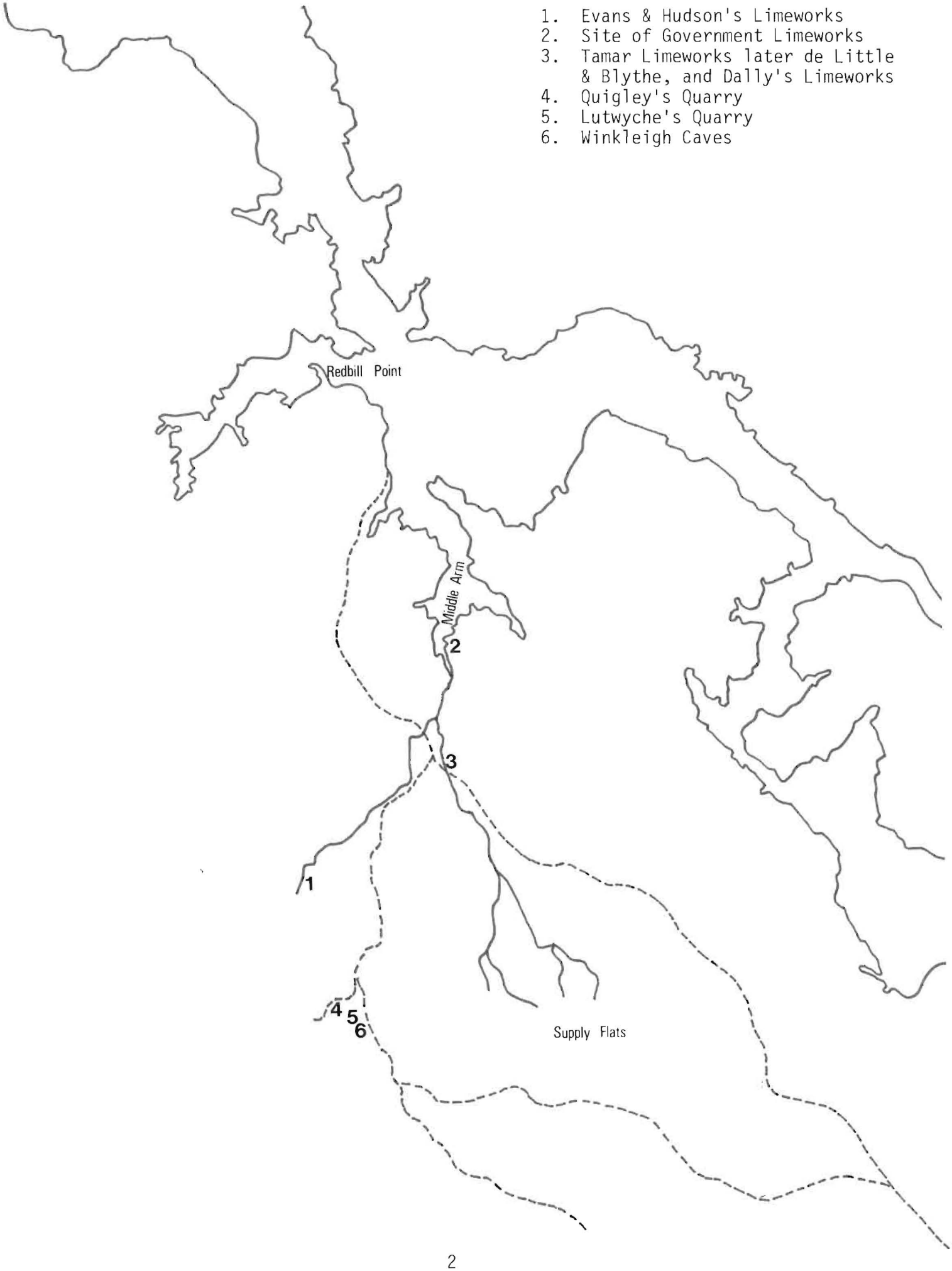
A close relationship existed between Launceston and the mining activities along the Tamar valley with much of the initial funding of the mining venture coming from Launceston business men. Similarly Launceston industries stimulated by the mining activities in the valley also serviced the mines to a great extent. For this reason this study can be seen as an extension of the earlier Launceston Industrial Heritage Survey.

We would like to thank those who helped in preparing this survey including staff at The Tasmanian Archives and the Northern Regional Library, Craig Sheehan, and Joanne Damon, Rhonda Hamilton, Mark Bartkevicius, Marilyn Beven and Rebekah Scott at the Queen Victoria Museum.

CHAPTER ONE

LIME - WEST TAMAR

1. Evans & Hudson's Limeworks
2. Site of Government Limeworks
3. Tamar Limeworks later de Little & Blythe, and Dally's Limeworks
4. Quigley's Quarry
5. Lutwyche's Quarry
6. Winkleigh Caves



CHAPTER ONE

LIME - WEST TAMAR

Government Lime Works 1804-1833

Lime, one of the basic requirements for building a new settlement, was sought and discovered soon after Lieutenant Governor William Paterson's arrival at Port Dalrymple:
'I landed near Redbill Point before I returned to the Cove and discovered a very large Bank of Shells in the Beach extending for near a quarter of a Mile [7.5km], and from 3 to 4 feet [90cm-120cm] deep; as the Limestone on burning has not turned out so good as first expected, and the Shells being much preferable in Quality and more convenient for our purpose, I have therefore given up the idea of using any of the Stone while Shells are in such Abundance; there is likewise plenty convenient for buildings which may be erected at Outer Cove'.[1]

It seems that by 1820 this supply had been exhausted, and the problems with the burning of the limestone overcome. Commissioner Bigge examined C. J. Vandermeulen, the commandant at George Town:

'Q. Where is the Lime obtained?
A. We get the Lime stone from a quarry in the middle arm, about seven miles [11km] up the River on the opposite shore, and it is burnt there.
Q. Is it of good quality?
A. Very good, and a kiln well burnt will produce from 12 to 1,400 Bushels [40-50m^2].
Q. How many Bushels can you burn in a week?
A. I think we might supply the kiln, to burn it once in Two months producing the quantity I have mentioned.
Q. What is your present consumption of Lime?
A. From 60 to 80 Bushels [2.2-2.9m^2] per week.
Q. Is there a gang stationed at the Quarry?
A. There is an overseer and Two men and sometimes Three.
Q. Are they hutted?
A. They are.
Q. How are they supplied with Provisions?
A. Their Provisions are sent to them regularly every Saturday. Besides they keep a Dog and are never in want of Kangaroo Flesh.
Q. Do you find that the gangs that are thus stationed at a Distance run away frequently?
A. They do not; if the men misbehave, I charge them on the Complaint of the Overseer'.[2]

These lime works remained under government control until 1833 when they were leased to J. K. Murphy for £100 a year. At this time 6 000 bags of lime were produced yearly. Seven convict workmen and a blacksmith worked on the site.[3]

Tamar Lime Works

Robert de Little, Launceston builder cum architect established his works further upstream in 1835 and advertised:[4]
'Stone Lime at Reduced Prices from the Tamar Lime Works. The undersigned begs to intimate to the public that from this date, he will sell the best Stone Lime from the above establishment, at one shilling and three pence per bushel, from one bushel upwards. The constant customers will be supplied at one shilling per bushel'.[5]

In 1857 Gilbert Blythe, proprietor, offered the Tamar Lime Works for sale by private contract. The plant consisted of a 'lime-kiln, in good order, equal to 1 000 bushels [36m^2] per week, sheds, screens, a barge that will carry 1 000 bushels [36m^2] of lime, two fine young horses, two carts, with harness complete, one plough, one pair harrows, and one roller, besides the necessary quarrying implements'. Also included in the sale was 'a capital four-roomed cottage, with kitchen and store, besides three good huts, with large barn, four-stall stable, cart sheds, forge and other necessary buildings... The works are fitted with a pair of powerful pumps, which are driven by a water wheel, at a fall of 12ft [3.7m], this power can be increased to an 18 feet [5.5m] fall, at a comparatively trifling cost...' Also for sale were 'the old Government Lime Works, situate at Middle Arm Creek, with plant and working materials complete. These works possess the additional advantage of having water carriage to the lime-sheds close to which the barge can load'.[6]

Gould's Report

Charles Gould in his geological report on the country near Ilfracombe described two important beds of limestone in the neighbourhood of Middle Arm Creek. These were 'separated by a thickness of about 350 yards [320m], and locally distinguished as the blue and the white limestone. The latter has been only quarried in one spot, where by measurement and calculation I have estimated the thickness to be about 140 feet [43m]. This is upon one of the tributaries of Middle Arm Creek, where the Messrs. Dally have been working it for some years past. This limestone has a light colour, and crystalline structure. It takes a good polish, and would contrast favourably with

many imported marbles. The blue limestone has been worked for many years past and in several localities. For a long period it was chiefly obtained from quarries on the west side of Middle Arm Creek, where the stone was only met with below the level of the creek, and costly appliances for unwatering the quarry were necessitated. The Messrs. Dally have subsequently discovered it in a more favourable position on the east side of the creek, where the quarry is now open. The thickness of this quarry is probably in excess of that of the one described above. I believe that the limestone worked on Messrs Evans and Hudson's ground, south of the Ilfracombe Tramway, will prove to be the same bed. In the latter localities the limestone forms an important feature in the District, rising into hills and projecting in large rocks from the surface of the ground: in the former instance it lies low and is concealed by drift, so that its probable position can only be determined by a careful study of the outbreaking of springs, peculiarities of vegetation, and other local physical characters which are consulted by those in search of it. The Messrs Dally have made numerous borings in search of it; and from the information afforded by them, and my own observations, I have indicated on the chart by a broken line the probable continuation of the limestone beneath the surface from those points where it is ascertained to exist. It must, however, be in many instances covered by a great thickness of marine drifts; for on attempting to sink on the line of the limestone north west of Mr Blythe's old quarries, and near the side line of the property on the rising ground forming the head of the small valley in which the quarries are situated, the Messrs Dally passed through a thickness of 40ft [12m] of drift, leaving off in boulders exceeding a foot [30.5cm] in diameter'.[7]

A 'Wanderer' was told by John Dally in 1877, after the outbreak of gold fever at Brandy Creek, that the price of lime would have to be raised, as the lime kilns, about fifty yards (45m) from Dally's house were at a standstill. Dally's men had discovered more lucrative employment on the Cabbage Tree Hill.[8]

Montgomery's Report

Geological surveyor A. Montgomery in 1891 had higher ambitions for the Beaconsfield lime:
'The blue-black crystalline limestone found in the East Tasmania bore takes a very good polish, and is really a very handsome marble. When polished it is nearly black, the bluish shade in the colour being only perceptible on close inspection, and numerous veins of pure white calcite give variety and beauty to it. The stone works well, being close-grained and hard. There should be no difficulty in getting blocks of uniform texture and any required size from Dally's quarry on Blyth's Creek [Middle Arm Creek] (where this marble is being burnt for lime), or more easily still from the large masses cropping out at the head of the

Flowery Gully. If worked by skilled marble-workers I have no doubt that this stone could be sold profitably in considerable quantities for ornamental and monumental purposes. The quantity easily got at is very large, and the facilities for quarrying are good; while the proximity to a shipping place, and ease with which tramways could be constructed from it to the quarries, are very favourable for cheap transport to either the local or the Australian markets.

The pale bluish white marble found at the old limekiln at the second bridge on the road from Beaconsfield to Launceston would also be of commercial value if easily obtained. As the workings of the old quarry on this bed are now full of water I cannot speak as to the size of it, or as to whether large blocks could be got of uniform texture and free from flaws. If however the loose stones lying about fairly represent the general quality of the marble it would be well worth quarrying'.[9]

Twelvetrees' Reports

Prior to World War I Australia was importing raw materials for the manufacture of cement. In 1914, when the Launceston Marine Board was proposing to build a large new port at Bell Bay, the government geologist was requested to explore the West Arm for possible cement material. The limestone investigated at West Arm, York Town Rivulet, Blue Stone Ford (on Anderson's Creek) was not of sufficiently pure quality, but it was suggested that the limestone at Beaconsfield and Winkleigh were worth further investigation.[10]

In 1916 the government geologist again investigated the area this time concentrating on the south-east and north-east of Blue Tier Hill, rather than at the Middle Arm. 'A strip of limestone country, 1 mile [1.6km] long by 3/8-mile [600m] wide occupies Adam's Hill, extending from the foot of the hill at Johnston's Creek in a south-easterly direction as far as the Rookery Road. The exposures terminate just a little south of the junctions of that road and the main road to Winkleigh. The strike of the limestone is a few degrees east of south, and its dip is east of north. The older ferruginous strata on Dr L. G. Thompson's 24 acres [9.7ha] must therefore underlie the limestone basin. The exposures of the limestone at the north-west end of the belt are at Quigley's quarry at the northern boundery of Dr Thompson's 29 acres [11.7ha] (A. E. Thomas), and just below the road going up Adams' Hill on the 500 acres [200ha] in the names of Evans, Thompson and Douglas, known locally as the Bank property. The road ascending the hill between the 82 acres [33.2ha] in the name of A. Douglas and the 113 acres [45.8ha] in the name of F. N. Beams traverses the length of the belt and has limestone on each side of it, the bulk being on the 113 acres [45.8ha]...

The limestone is a bluish grey compact rock, veined with calcite, and near Mr Beams' house possessing a subterranean cave channel known as the Winkleigh Caves. These used to be resorted to by visitors: they have, however, been left to themselves and the depredations of tourists, and have now no spectacular characteristics. The surface outcrops of the limestone occur as a series of rocky knobs at irregular intervals...

The limestone area on A. Douglas' property is well-timbered, that on Beam's farm is all cleared land.

The rock has been quarried for lime-burning on Beams' land, where a kiln was operated by Mr Lutwyche, but is now abandoned; and Quigley's lime quarry has also been worked on the south boundary of the Bank property'.

Twelvetrees estimated that the lime on the hill rising from Lutwyche's quarry would yield a net tonnage of 1 440 000, [1 468 800t], and could be worked over forty-eight years. It was felt that even twenty to twenty-five years of work would make a cement works economically viable. The rock he described as high-grade limestone 'perfectly suitable for the manufacture of Portland cement when mixed with clay or shale of proper composition'. Locating clay or shale was harder. Clay from the overburden lying on the limestone in the road-bank opposite Beams' house was the only suitable material found in the vicinity, it was insufficient for large scale manufacture.

He envisaged the works site being at the foot of the hill in Johnstone's Creek Valley. 'The limestone would be taken to the kiln by tramway from Lutwyche's quarry, and perhaps by aerial ropeway from the higher benches. The conveying of this material to the works would involve a transport of about a quarter of a mile [400m] or a little over. The clay and shale transport will probably be about the same distance. The transport route from Lutwyche's face is a singularly level and easy one. There is plenty of room on this flat available for all the buildings required in connection with the works and port railway, storage sheds for farmers' freights etc'.[11]

By 1923 a better source of shale and limestone had been discovered near Railton where the Tasmanian Cement Company erected their works.[12]

Site of Government Limekiln
(8315 Tamar 55GDQ 864393)

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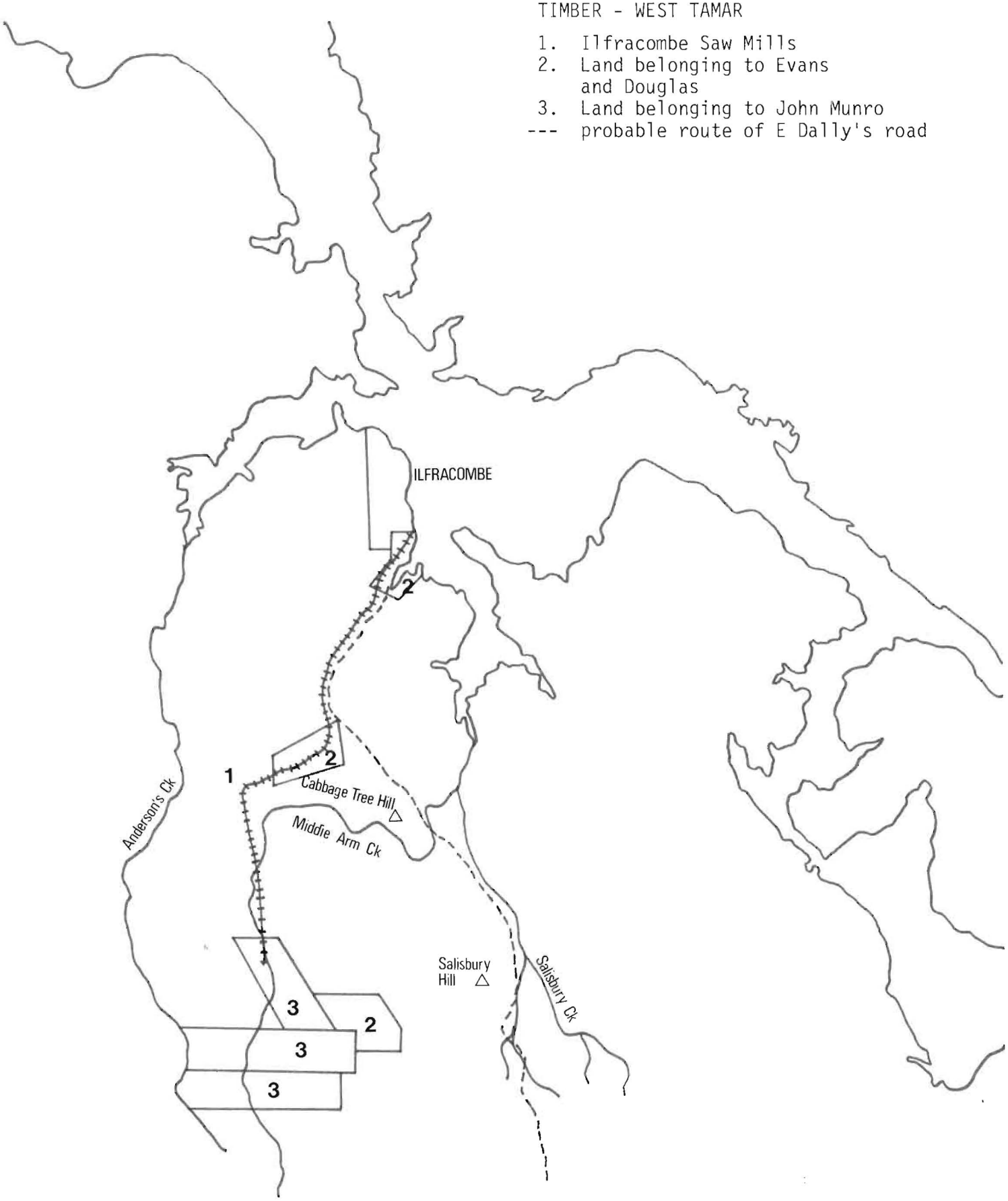
CHAPTER TWO

TIMBER - WEST TAMAR

1. Ilfracombe Saw Mills
2. Land belonging to Evans and Douglas
3. Land belonging to John Munro

--- probable route of E Dally's road



Supply Flats

CHAPTER TWO

TIMBER - WEST TAMAR

The Ilfracombe Saw Mills Company

The timber at Ilfracombe, on the West Tamar, was first noted by Lieutenant Governor William Paterson in 1804, when he positioned his first settlement in Northern Tasmania in the vicinity. Westwards he had discovered 'the finest I ever saw of the different species of eucalyptus'. Southwards, at Anderson's Creek, he found the trees lofty and fit for any purpose.[1]

The first indication that the timber in the locality was being used commercially is in 1853 in a letter to the surveyor general from Edward Dally,[2] a Cornishman who had settled on the River Tamar around 1845.[3] He was, he wrote, a resident of the township of Ilfracombe and employed a number a splitters and sawyers, and had taken out timber licenses for several years past. To facilitate the removal of timber he had spent upwards of twelve months clearing a 25 kilometer road through the bush, leading from Ilfracombe to the main road between Launceston and the supply Flats, and from there to within 16 kilometers of Deloraine.

In late 1853 Dally was disconcerted to find parts of this work being dug up to accommodate a tramway. Not only was this obstructing normal traffic, it was also doing great damage to the road. On demanding an explanation from John Munro, the perpetrator, he was told that government permission had been granted.

As early as 1850 a notice of application to the Tasmanian parliament for a tramway and jetty bill had been drafted by the solicitors of the promoters of the Ilfracombe Saw Mills Company.[4] The proposed tramway was to run through land belonging variously to the Company, the Crown, and to Robert de Little. The Bill would allow them not only to build the tramway but also to erect quays, wharves, jetties, houses, warehouses, sheds, etcetera. The surveyor general felt that Dally had no cause for complaint.[5]

The major shareholders of this venture included, apart from John Munro who was a Launceston merchant and owned a shipbuilding yard at Gravelly Beach not far from Ilfracombe,[6] Adye Douglas, a solicitor who was later to become the president of the Tasmanian Legislative Council[7] and Francis Evans, manager of the National Bank of Tasmania.[8] The names of all three appeared again and again on shareholders' lists as iron, and then gold was discovered on the Tamar.

The demand for timber by the mainland colonies caused by the rapid emergence of gold-related towns made the saw mill a good proposition, and in 1856 the Company took out a mortgage of six thousand pounds with the Hobart Town Savings Bank.[9]

The tramway bill first mooted in 1850, was not passed until 1857. The Ilfracombe Saw Mills and Railway Company was established, according to the Act's preamble, 'for the purpose of supplying the Public with Sawn Timber at reasonable rates'.[10] The argument was that by establishing a tramway to the Tamar, the cost of production would be reduced. The Company was said to have 'at considerable expense... erected... Mills and Machinery and other works'.

About a tenth of the Company's estate was leased out, the lessees being required to cultivate the land in a 'proper and husbandlike manner'. It was to be cleared, all trees under 45cm in girth were to be stumped up, and the rest to be ring-barked. The owners maintained the right to enter the land at any time to cut the timber. The lessee was forbidden to sell any wood.[11]

Only three years later, the mortgagees defaulting on repayments, the Ilfracombe Saw Mills Company property was put up for auction by Bell & Westbrook in Launceston. The mills were described as 'exceedingly valuable', being in first-rate order with two engines, one 9kW and the other 4.5kW vertical and circular saws, sawbenches, and 'all the appliances to a saw mill'.

The 858ha estate contained an abundance of good timber, and about 80ha were let in small farms to tenants on improving leases at a rental of 150 pounds. A considerable proportion of the estate was advertised as being fit for cultivation.

The buildings were said to comprise a neat four-roomed weather-board cottage, engine house, timber sheds, men's huts etcetera. Mention was made of the tramway running through the estate and the abundance of lime and building stone on the property.[12]

The sawmill was purchased by Francis Evans for 3 000 pounds,[13] and it appears that he kept the industry going for in 1866 there were said to be extensive steam and water power saw mills at Ilfracombe,[14] although the tramway was disused.[15]

Three years later, in 1869, when a Tamar river pilot pointed out Ilfracombe to one of his passengers, the mill had been abandoned. There remained a two storied wooden building and half a dozen workmen's slab huts 'all more or less in a dilapidated condition'. He said that the mills had been built some years since by a speculator. Whether it had been abandoned from want of capital or of a ready market for the timber he could not tell.[16]

The tramway was to come into being again in 1873 when the Ilfracombe Iron Company began quarrying a short distance from the late saw mill. An advertisement appeared in the *Launceston Examiner*:

> 'Tenders for sawing rails required - Price to include delivery of timber along the site of the Ilfracombe Tramway'.[17]

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5. *Ibid* Ms 7 January 1854

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8. *Ibid*, vol II p.75
The other shareholders were, in 1856, John Thompson, merchant; James Colquhoun, miller; Richard Helen McKenzie; and Donald Munro, farmer.

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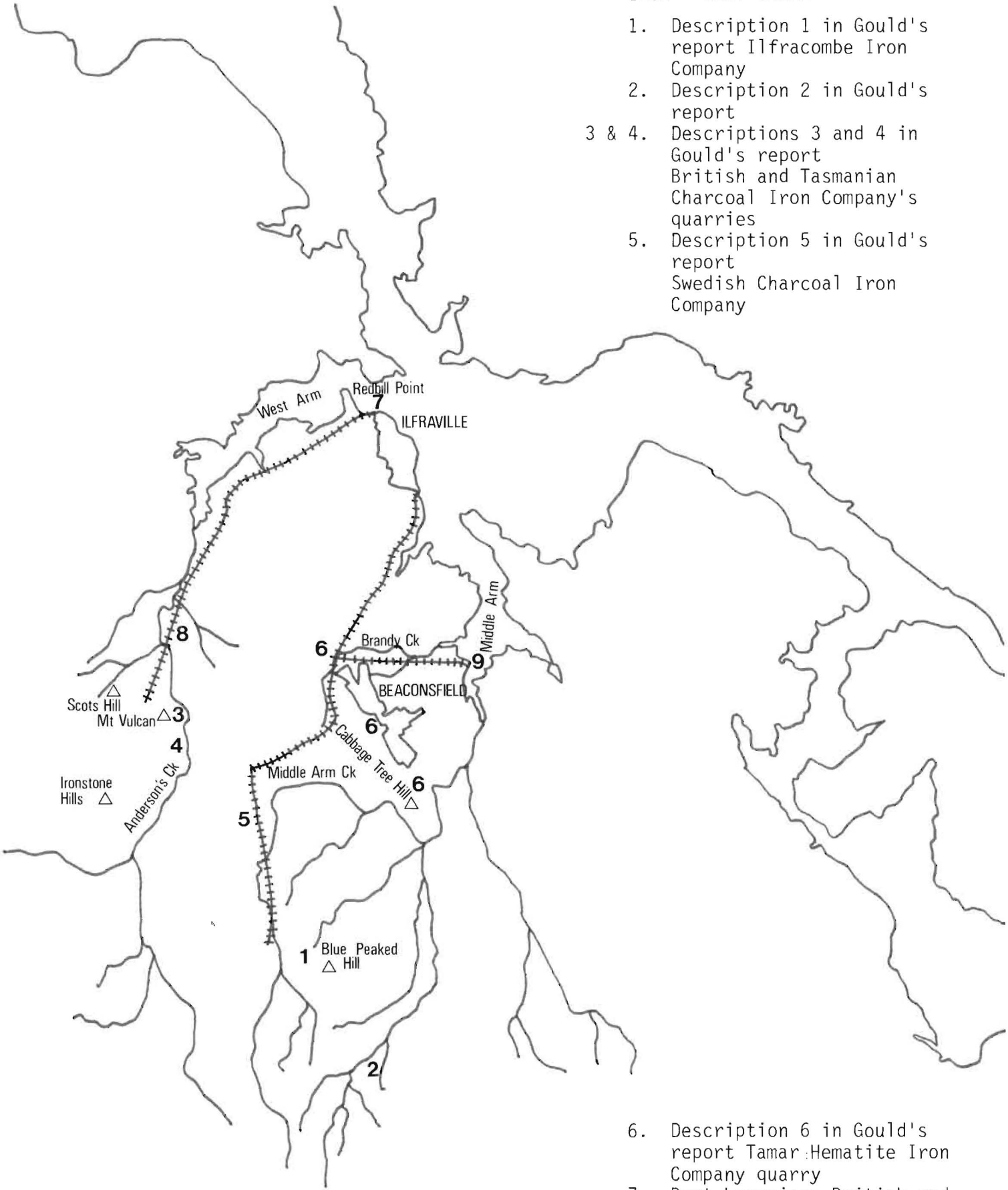
CHAPTER THREE

IRON - WEST TAMAR



1. Description 1 in Gould's report Ilfracombe Iron Company
2. Description 2 in Gould's report
3 & 4. Descriptions 3 and 4 in Gould's report British and Tasmanian Charcoal Iron Company's quarries
5. Description 5 in Gould's report Swedish Charcoal Iron Company
6. Description 6 in Gould's report Tamar Hematite Iron Company quarry
7. Port Lempriere British and Tasmanian Charcoal Iron Company furnace
8. Leonardsburgh. Dr Harrison's Furnace (Tasmanian Charcoal Iron Company)
9. Swifte's Jetty. Tamar Hematite Iron Company

CHAPTER THREE

IRON - WEST TAMAR

Introduction

The Ironstone Hills behind York Town inspired visions of a great industrial future for Port Dalrymple. Lieutenant Governor William Paterson hoped that should the hills ever become worthy of notice, he would be credited with their discovery. In December 1805 he sent Governor King as much iron ore as his convicts could carry. Had carts been available to him he could have loaded 'the whole Navy of Great Britain'.[1] A month later he was referring to the 'Rothsay Mines' and stressed again 'if I could have a few turns of the Sydney bullock carts I can at any time load a vessel'.[2] He envisaged the hills becoming 'a place of Punishment for the unruly, by working them in Irons as they do in Mines in many Parts of the World'.[3]

Paterson's time was so taken up with the survival of the settlement that the exploitation of mineral resources was a luxury he could not afford. However, the iron hills were not forgotten. He wrote to Viscount Castlereagh in August 1806: 'My Head Quarters remain in the situation I was necessitated to fix on at Western Arm, but I am yet unable to determine of the propriety of their remaining here, from some inconveniences we discover in the Channel of it; but we have other situations on both sides of the Harbour that may be advantageously occupied and from whence the largest Vessel can be unloaded at all times of the Tide, an advantage Western Arm does not possess; but should the apparently Valuable Ore of which I have discovered such abundance, become of Moment sufficient to induce the attention of Government, this place will be always desireable from its Contiguity to the Situation of the Metal, and from its Convenience for many public purposes'.[4]

The samples sent to England by Paterson were certainly promising. They were smelted at Plymouth Yard and yielded 64% to 72% iron.[5] Their quality was judged to be as fine as the best Swedish iron. The surveyor John Oxley shared Paterson's enthusiasm when he visited the Port Dalrymple in 1811. He felt the ore could be 'the first means of repaying in some measure the expense the mother Country has been put to in forming and supporting [the settlement]'. He believed 'the Time may probably be approaching when the Cheerful Noise of Foundaries and Manufactories together with the Activity and Bustle of Commerce will be heard on the at present almost uninhabited Shores of Port Dalrymple'.[6]

Simeon Lord, the Sydney entrepreneur, hearing about the iron deposits, wrote to Governor Macquarie in 1812: 'Sir, Being desirous to try if the Iron Ore at Port Dalrymple can be smelted or otherwise used in this Colony, I most respectfully pray your Excellency will be pleased to allow me to work a Mine and import to this Settlement, such Quantity thereof as may be necessary, or that I may be able to procure from Time to Time, to enable me to repay the Expenses in Case of succeeding in the Experiment'.[7]

Macquarie who, when he visited York Town ('this deserted dessolate village') the previous year, did not mention the iron, granted Lord permission for the period of one year to 21st February 1813, subject to such regulations as government deemed advisable to establish.[8] Lord's business affairs took a sharp downturn about this time[9] and it appears nothing ever eventuated. Commissioner John Bigge lamented in 1823 that no attempt had been made to convert the iron ore.[10]

There were still enthusiasts. Surveyor George William Evans wrote in 1822: 'Little doubt can be entertained but that at some future period the river Tamar will become the Naval Arsenal of these seas, as it not only furnishes ample supplies of timber, coal, iron, and copper, but likewise hemp and flax. The peculiar formation of its mouth, its serpentine course, and the high surf which beats on the beach will always render it impenetrable to a foreign enemy; and it may be safely predicted that, in the process of time, Port Dalrymple will become a place of much naval utility and will give a Value to Australia of great national importance'.[11]

A little later in 1839 W. Mann was more realistic: 'Ironstone and ore, so rich as 75 per cent., has been discovered; and there is little doubt that the country abounds with many other mineral productions; but until the population becomes more dense, they will be better employed in pastoral and agricultural pursuits, than in working mines, the productions of which requiring manual labour and machinery to bring them to perfection, will be procured from England cheaper for centuries to come, than they could produce them.[12]

In 1863 the new *Walch's Almanac* commented on the considerable extent of iron ore at Ilfracombe[13] but it was in 1866 when geological surveyor Charles Gould published his report on the country near Ilfracombe, that interest was rekindled. He described the following areas:

1. 'The point illustrated is about seven miles [11km] from the beach, along the now disused tramway formerly belonging to the Ilfracombe Saw Mill Company.

   To the west of the small creek indicated on the chart the ground is level, alluvial, and therefore exhibiting no trace of the probably underlying lode.

To the east the ground rises at first gradually, and afterwards more steeply, until a maximum angle of about 20^0 is reached near the summit of the ridge, which is itself merely an offset spur from the conspicuous and elevated mountain known as the Sugar Loaf.

The ore is exhibited in boulder-like masses strewing the surface or imbedded in the ground, and may be traced along the surface for a distance of nearly 300 yards, [275m] corresponding to 286 [261m] in plan. The width of the deposit has been laid down as accurately as was possible without undertaking mining operations. At various points there are apparently offsetting veins, and towards the upper end appearances favour the conclusion that the vein is difurcating, and splitting into strings.

The ore is of greatest excellence in the lower ground, that at the extreme upper end being inferior in richness and not quite so abundant in quantity. The ore shows itself to be of good quality, however, for more than one half the length of the reef, and even the remainder is at least equal to much of the iron ores smelted in other countries. The general direction is about 30^0 W. of S. and S. of W.; the average width about 66 feet, [20m] the length out cropping 300 yards, [275m] and the average slope about 14^0.

Taking a rough estimate, this gives the cubic contents of the portion of the vein above the water level at about 705 800 tons. Assuming that only one-half of this is rich ore, - and I consider this to be an estimate below rather than over the mark, - we have an amount of 350 000 tons of rich ore lying above the water level, and presenting every facility for being *quarried* in stopes at an exceedingly low rate per ton, the other moiety presenting equal facilities of working; while every yard in depth below the water level would yield, on the same calculation, 20 458 tons, without taking into consideration the extension of the lode westward, which would largely augment it. The ore contained in this lode is brown hematite: it presents all the usual variations of the ore in different parts of it: at one part it is compact and massive, at another crystalline, in reniform and botryoidal masses, with a fibrous and radiated structure. It will probably average from 55 to 60 per cent. over a large portion of the lode. It stands out from the surface and towards the upper end detached masses of immense size occur. The largest of these blocks has the following dimensions: - 12 feet [4m] in height, 22 feet [7.5m] in length, and 15 feet [5m] broad. In this the ore alternates in thin layers of from ¼ inch [6mm] to ½ inch [12mm] in thickness, with ferruginous sand, and the layers have a somewhat wavy structure, so that the whole has a distant resemblance to one of the foliated rocks: even here, however, there is perfect crystallisation at intervals.

2. 'The next deposit of ore is of similar character to the above, although much less extensive in amount, is at the end of the Tramway on which the first is situated, and at a distance of about ten miles [16km] from the shipping place. Here again appears to be a defined reef or lode containing brown hematite, and taking a general direction of east and west. This necessarily carries it across the strike of the formations, and we are enabled to trace it from the sandstone rocks into the limestone adjoining. It is, however, much less exposed than the first one, and it is therefore difficult to estimate its thickness - an average of five [1.5m] or six feet [1.8m] would probably be near the mark - but to determine this point a rather considerate outlay for mining operations would be necessary; and, as its distance from the water is so considerable, it is probable that this would be one of the last to be investigated for practical purposes. Should, however, at any future period mining explorations for iron smelting purposes be conducted in this District, it would be interesting to make a slight examination of this lode where it traverses the limestone country, for the purpose of ascertaining, what is not unlikely to be the case, that some important modification of its mineral contents had been determined by the change of gauge'.

3. 4. and 5. 'Still belonging to the same group, and dispersed along a N.W. line at short intervals apart, and more or less connected by slight indications of ore, there are three principal deposits, which from their magnitude and importance merit especial attention. Two of these are on the west side of Anderson's Creek, the other on the east; the first are on Crown land the last is on private property. They are all within the area of the serpentine rock, and, as I shall presently point out, have been much affected by this circumstance...

These Ironstone Hills, as they may appropriately be called, lie about two miles [3.2km] from the water's edge, with a nearly level road to it through gently undulating country; and the hills themselves rise to about 100 [30m] or 150 feet [45m] above the level of the adjoining creek.

The flat country between the two hills and more or less surrounding their bases, is strewed with a superficial drift of magnetic oxide of iron, which is so abundant that in many places a cart could be quickly loaded by specimens picked up by hand. The largest fragments I have met with on the surface in this manner have weighed from twenty to thirty pounds...

The area occupied by the drift of magnetic oxide surrounding the hematite deposits is very extensive; in fact to be measured by acres; and on sinking through the drift, which is seldom more than a few inches in thickness, there occur

at intervals in regular masses, seldom exceeding a few inches in thickness, a combination of magnetic oxide of iron and an asbestiform mineral, which is found transversing the Serpentine in short strings. I commenced a series of open trenches, starting from the point on the flat where the drift was most abundant, and leading in an angular direction towards the summit of the hill. I did this with the object of satisfying myself as to the thickness of the magnetic oxide drift, and also for the purpose of partially exploring the surface of the bedrock, and ascertaining whether the ore had been liberated from it in immediate proximity to its present position, or had been slightly removed. The bedrock in all cases appeared to be serpentine. Some thin strings of magnetic oxide of iron were met with... With regard to the deposits [No 3] and [No 4] I am inclined to be speculative. They differ so remarkably from the hematite lode already described, that some different explanation for their occurrence becomes necessary...

In each case the main part of the deposit commences on the crown of a hill, and consists of larger rounded boulders heaped on one another or protruding from the surface of the soil. On fracture they are found to consist of alternate layers of brown hematite and earthy matter, the richness varying, of course, with the relative portions of these two, and varying so much that it would be unsafe to attempt from surface knowledge to offer any estimate of the total amount or proportion of rich ore. I have contented myself with charting... the whole area within which these boulders occurred. It will be seen that in the one instance the area is about 360 yards [330m] long by 70 [64m] broad, and is of an elongated form extending to the northeast. In the other it is subrectangular. To a cursory observer the appearance of these deposits is very anomalous, presenting... that of a capping, on the summit of each hill, of from fifteen [4.5m] to twenty feet [60m] in thickness of large rounded boulders, ranging up to one or two tons in weight, all more or less good ore... Although the boulders cropped more or less over the area included in [No 3] and [No 4] yet that they occurred in chief abundance in the direction of certain lines indicated on the charts by the small marking, and could be traced in those directions down the hills into the adjoining flat, and that many contained fragments of the magnetic oxide, together with other indications of their being of a derivative character. I therefore infer that the value of these deposits is very imperfectly represented by the surface masses, - which I look upon as having derived from the destruction of rich iron ores, such as magnetic oxide or crystallized hematite (probably the former). It is also likely that they are nothing more or less than what miners call the back of strong lodes of magnetic oxide of iron which would in that case be discoverable by mining operations conducted beneath the hills indicated on that vein. In fact the drift below points

to the existence of veins of magnetic oxide of some size, while the magnitude of the surface deposit renders it probable that the size would be considerable. I consider that eventually these spots will become of great value.

[Deposit No 5] is on private property, on the eastern side of Anderson's Creek: it lies on either side of the side-line which separates the properties of Messrs. Evans and Barnes and commences at about 25 chains [500m] from the joint northern boundary of the two properties: it is of an oval form with the long diameter extending in the direction of N.E. and S.W., - the length is above 440 yards [400m] and the greatest breadth 400 yards [365m]. This more nearly resembles capping on the hill than either of those last described. The surface is more or less strewed throughout the area represented with rounded masses of hematite intermixed with a very variable proportion of clay and sand. These may be traced down the hill for a depth on the average of 20 feet [6m]. They have evidently been remade from some pre-existing ore of iron, which, as in the last two cases, will probably prove to be magnetic oxide, or a lode or lodes of brown hematite, the foreign material being mechanically intermixed and derived from the surface soil. The boulders in this instance are more prominent along the edges of the hill, andespecially on the western side, where also the ore appears to be of better quality than elsewhere. The whole of the above mentioned outcrops of ore are evidently referable to one line of force, determining lines of fracture, which in the sandstone and grit formation have been filled with crystallized brown hematite, and in the serpentine with magnetic oxide. [The 'eminent chemist' Dr Price of London wrote a report on the value of samples of ore taken from here, as did Messrs Clark & Ford, Assayers of Melbourne who stated that it contained 72% of iron and was of high quality.]

Deposits No 6 'are also situated on one line, which has also evidently been a line of force acting in a direction parallel to the former, but along which it is more difficult to trace the outcrop of the ore, in consequence of the surface of the ground being to a great extent obscured by a thick deposition of marine or estuary drift. To which cause I also attribute a marked difference in the character of the ore along some portions, as, for instance, on the property of Mr James Dally, where an area of about 180 yards [165m] by 140 yards [128m] is occupied by what rather approaches a ferruginous grit than a hematite, boulders and tabular expansions of which crop from the surface or are met with a little below it. My impression is that this again merely represents the surface development of a richer ore below, occurring in veins, and which, from the nature of adjoining formation, I should predicate to be hematite. The existence of grit and pebbles in the ore is quite a sufficient indication of its composite and derivative character. From this point the ore

> may be traced south-easterly continuously to Brandy Creek and thence in intervals along the flanks of Cabbage Tree Tier to the eastern side of Middle Arm Creek, some iron cropping out wherever the thickness of marine drift has been sufficiently stripped away to permit of its re-appearance. There is an interesting spot on this line where the formation of beds of iron ore, similiar to those of which description has been made, appear to be actually going on at the present period. It is on the property of Alexander Hunter, where springs of water holding a very large amount of ferruginous matter in suspension break out and form mounds of an intermixture of ore, earth, sand and matter with a large amount of peroxide of iron; while at a short depth below the surface, hard and tubular masses of consolidated ore are met with. The farthest point south on this line where I have found the iron ore in any abundance is on the eastern side of Middle Arm Creek, immediately south of a small property of Mr Blythe's, where there is what I believe to be the outcrop of a regular vein,... Here good hematite iron is met with, and the course of the lode can be traced for a distance of fifty or sixty yards [45.55m]: mining operations would be necessary to determine the whole extent of it'.

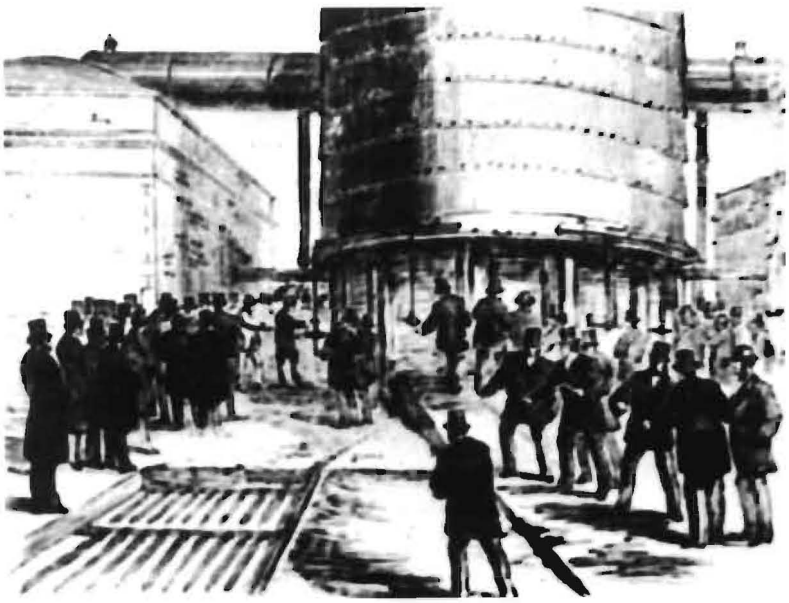
In September 1866 Gould spoke to the Royal Society of Tasmania about Ilfracombe. He referred optimistically to the possibility of combining a Pyroligneous Acid Works with Iron Ore Reduction Works by large scale charcoal production. He also enthused about the serpentine which could not only be used as an ornamental building stone but also as a source of sulphate of magnesia.[15]

The British and Tasmanian Charcoal Iron Company

In 1872 James Scott M.P. explorer and surveyor, and T. C. Just, newspaper proprietor and entrepreneur, took up 400 acres of land which included the fourth deposit described by Gould, samples of magnetic iron from which were said by G. Foord, government chemist and assayer of Melbourne, to contain 70% metallic iron. Foord went on to say that if the ore existed in any quantity, and under circumstances otherwise favourable to economic treatment, its high percentage of iron and its freedom from all obnoxious constituents will render it of great value for iron and steel manufacture'.[16] Samples of this iron were sent to a variety of experts. In 1872 Sydney Gibbons F.C.S, analyst, tested six samples of brown hematite. Their metallic iron content ranged between 49.5% and 69% and he believed all to free from all features of an objectionable character, such as phospherous etc.

Samples sent to England yielded 50.9% metallic iron at Lay's Chemical Works near Stourbridge 59.5% at Messrs Johnson & Son, asseyers to the Bank of England, H. M. Mint etc; James W. Montgomery F.C.S of the Chemical Works, Whitehaven obtained 71.8%,

The opening of the British and Tasmanian
Charcoal Iron Company Works



Governor Weld turning on the hot blast
(*Illustrated Australian News* 10 August 1876)

Banquet on Board the P & O Steamer *Avoca*
(*Illustrated Australian News* 10 August 1876)

63.79% and 63.24% from three samples. Dr John Black estimated that his sample would yield 64.42% pig iron or 59.47% metallic iron.

Just sought investors in Launceston, but they were rather dubious. Eventually the Tasmanian Charcoal Iron Co. was floated in Melbourne with a capital of £80 000 in 40 000 shares. Just was appointed local director, and William Leonard, an experienced Scottish iron-worker was brought out as provisional manager.

They planned to start a small scale operation manufacturing charcoal iron by the direct process in open catalan forges. The resultant iron blooms were to be forged with a steam hammer into rough shaftings, stamper heads, etc which always seemed in demand in Melbourne.[17]

A jetty was erected 100 meters into the Tamar at Redbill Point, and an eight kilometer wooden tramway was laid along Andersons Creek. At Western Arm the township of Port Lempriere, named after one of the chief shareholders, was laid out.[18] The township of Leonardsburgh named, after the manager, was laid out at the end of the tramway where the first furnace was erected.[19]

The directors were persuaded to abandon the conventional method they had intended to use, and try Dr Harrison of Melbourne's patent hydrogen gas furnace. Harrison's furnace was described as being something after the plan of the ordinary reverberatory furnace, but it is much longer and is fitted with a retort in which hydrogen gas is generated, and by the mode of construction an enormous economy of heat is secured. The fuel to be used will be principally wood, with one ton of which Mr Harrison produces a ton of malleable iron, direct from the ore... The principle of the action of this new smelting furnace is based upon the circumstances that when any of the oxides of iron are subjected at a red heat to the influences of a current of hydrogen gas, the hydrogen combines with the oxygen of the ore, liberating the metallic iron, which is left on the sole or hearth of the furnace in a spongy mass containing a little slag, which is knocked out by an ordinary steam or tilt hammer. Mr Harrison's furnace is provided with an inclined sole, down which the melted slags find their way, and escape by an ordinary slag channel. In the event of cast-iron being required in place of wrought, the heat is urged until the whole of the ore is melted when the heavy metal seeks the bottom, whence it is withdrawn and conducted into pig moulds in the usual manner.[20]

Governor Du Cane laid the foundation stone on 6th December 1872. Just presented him with a trowel and hammer made from Tasmanian ore, smelted by a primitive process on the ground.[21] That month 111 men were employed and in April 1873 the first smelting took place. Unfortunately the heat was so intense that the Chimney cracked and work had to be suspended.

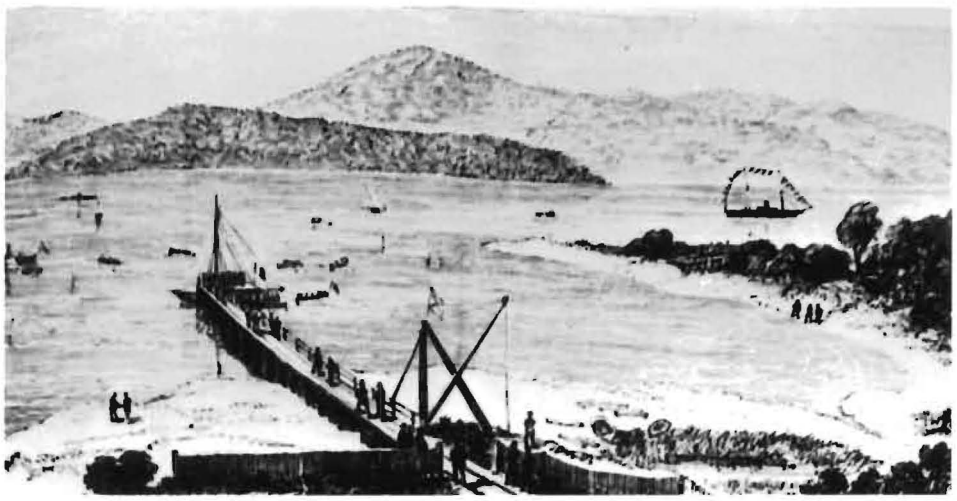
The directors decided to increase the capital of the company to £1000 000, and launch out on a moreambitious scale.[22] They secured the services of Robert Scott, late manager of the Coltness Ironworks near Glasgow, who after investigating the site returned to Scotland to order and supervise the construction of a suitable plant at A. Barclay & Sons, Kilmarnock. This was to include four blast furnaces, a Bessemer steel plant and rolling mills.[23] In July 1874 the company was refloated as The British and Tasmanian Charcoal Iron Company.

By November 1875 three large Cornish flue boilers with Galloway tubes had been installed, each capable of supplying steam to a 50 hp [37.3kw] and a 250 hp [186.5kw] engine. Only one blast furnace had been erected although the rest of the plant was capable of working four of them. The furnace was a large fire-clay cupola encased in heavy plate iron. It was 76ft (23.16m) high with an outer maximum diameter of 23 feet (7m) and inside diameter of 15ft (4.57m), tapering towards the top and bottom. The capacity of the furnace was 4 500 cubic feet (127m^3). The four tuyeres were to be supplied with hot or cold blast from a 250 hp (186.5kw) blast engine and the 5ft 10in (1.77m) air cylinder had a 9ft (2.74m) stoke. The heating ovens, air receivers and elevators were said to be of the most design.

The iron at Ilfracombe was conveniently situated for its supply of limestone for flux and access to the water. Although limestone was initially brought in from the Don.[24] If charcoal burning became economically impractical (which it did) it was still almost as convenient to land coal here as at Melbourne. Fuel was a major consideration for the siting of furnaces, as it was often easier to transport the ore to the fuel than visa versa. It took 500-600 tons of fuel to change the furnace, and it was hoped that 300 tons of pig iron would be produced a week. Coal from Newcastle was landed at two jetties and conveyed to a range of 40 coking ovens.[25] Preparations were made for the laying down of a 4ft 8½in (1.44m) tramway with rails of 50lb (22.68k) to the yard (91cm), to replace the less substantial wooden one.[26] Extra track was laid to the new jetty erected at Redbill Point, which was to give a depth of 16ft (4.9m) at low tide.[27]

The first casting took place on 27th May 1876, and soon afterwards 'A Launcestonian' described the works in some detail: 'Guided by manager Robert Scott to the eastern end of the company's enclosure where there are three large [Cornish flue] boilers cased in brickwork and partly sunk in a great square pit. These are employed to generate steam for driving the blowing engine, lifting engine, clay mill, and water pumping machinery, all of which will by duly noticed. These boilers are supplied with water from a long tubular iron reservoir placed at an elevation of about 30ft [9.14m] above the ground and into which the water is pumped from a well immediately underneath by means of steam machinery.

A substantial brick building with galvanised iron roof containing the 'blowing engine' which is used for producing blasts of air to keep up a fierce combustion in the smelting furnace. This engine is a huge affair of 250 hp. [186.5kw], and of novel construction as the bearer is carried at one end instead of in the middle. [This was a beam engine with steam and air cylinders placed together so that the working parts took up relatively little space. The steam cylinder was 36 inches (91cm) in diameter with a stroke of about 7 feet (2m) and the air cylinder was 5ft 10in. (1.77m) diam with a stoke of about 9ft (2.7m). The fly wheels were connected to the end of the long beam with light wooden rods. The other end of the beam was coupled to a light frame of iron called a spider the lower end of which worked on a pivot fixed in the foundations. As the engine moved, and the beam described the arc of a circle, the spider the other end rocked gently on its pivot joints.[28]] The fly wheels on either side are about 16 feet [4.9m] in diameter weighing 8 tons each, and steam is supplied by means of 14 inch [36cm] iron pipe connected with the three boilers. The waste steam passes through another large iron pipe into a strong tank outside the building where it meets with a stream of cold water which it brings to boiling point and the hot water resulting is pumped into the boilers by a donkey engine, saving fuel. The "blowing engine" is a huge double-acting pump of very beautiful construction. It pumps up cold air through three inlet and three outlet valve chests which consist of iron boxes with small square perforations and with leather valves on their inner sides. Each chest has four valves. The air is forced through the outlet valves into two large iron tubes, one placed horizontally, near the top of the engine and the other near its base. These two iron tubes are connected with a larger one placed outside the building in a vertical position, and this vertical tube meets at the top with a 6ft [1.83m] diameter horizontal iron tube which is placed 25 feet [7.62m] above the ground on iron supports and running along the front of the smelting furnace, and two brick stoves. So far the air forced by the blowing engine is cold. It descends from the 6ft [1.83m] horizontal tubes to a number of small pipes in the stoves. [In each stove there were sixty of these cast iron pipes standing vertically in connecting sockets, and each forming a double tube. The air passed up one side and down the other until had passed through the whole series.[29]] The now heated air passes through a square pipe into a circular one surrounding the smelting furnace about 7ft [2.13m] off the ground. From there it is conveyed by four short down pipes terminating in 'tuyeres' into as many openings in the lower part of the furnace. The 'tuyeres' may be compared to the nozzle of an ordinary pair of bellows. They are of iron, and to prevent them melting (they project a short way into the furnace) the interior of each tuyere is fitted with pipes through which cold water runs.



Redbill Point. The landing of Governor Weld
(*Illustrated Australian News* 10 August 1876)

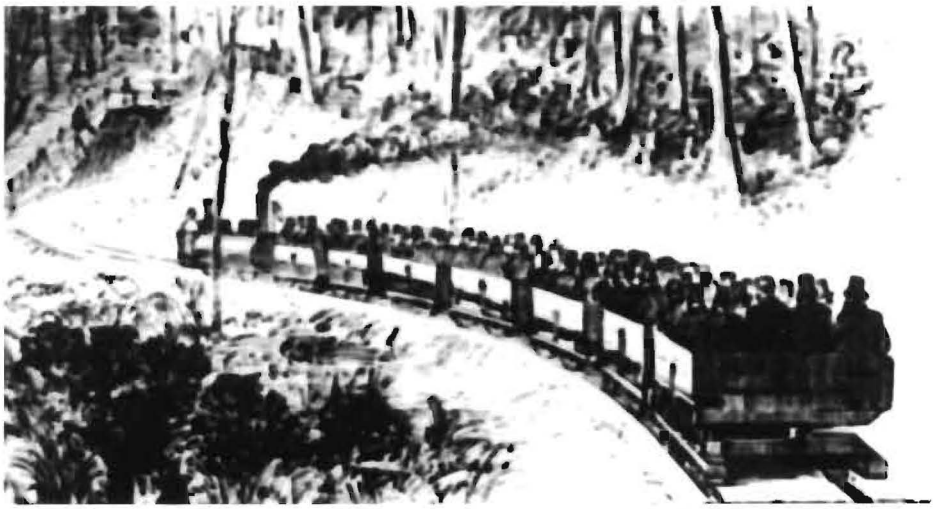
British and Tasmanian Charcoal Iron Company's Works
at Redbill Point
(*Illustrated Australian News* 10 August 1876)

The furnace is a circular tower 65ft [20m] high and 23 feet [7m] in diameter encased in iron [plate] and surmounted by a smaller tower called the tunnel head, having four feeding doors through which the furnace is charged with ore, fuel etc. and round which there is a gangway with an iron railing. The furnace is erected on a concrete and freestone foundation on which the fire-bricks (made in Scotland to special moulds for each course) are built up. Externally the diameter is uniform except for the base. Inside it is shaped like the chimney of a kerosene lamp. For about ten feet [3m] from the hearth (bottom) it is about 6 feet [1.83m] diameter. In the next 20 feet [6m] it gradually widens to about 15 feet [4.5m] and then gradually diminishes and where the charges are shot in at the top it is only 9 feet [2.74m] diameter. When in operation the materials - iron ore, coke and lime (flux) - will gradually fuse into a softened mass. The metal collects on the hearth at the bottom into rows of parallel rows called 'pigs' which are formed in sand in what is known as the 'pig bed'. The 'pig bed' is composed of a thickness of sand enclosed within brick walls, well drained, but open and unprotected from the weather. The sand is kept moist.

The furnace is charged from the top and the materials are brought up by means of an [a 50 h.p (37.3kw)] elevator worked by steam. The pulleys are plated 70 feet [21m] above the ground. The hoist is constructed of a rectangular framing in iron the corners being pillars of iron bound one to another by diagonals of angle iron, adding greatly to the strength and stability of the erection. The platform at the top of the hoist or elevator is formed of wrought iron girders, on which the pulleys rest and the interior resembles a double shaft, so that while one cage is going up one shaft on wire ropes, an empty one is coming down the other. The landing place on level with the gang way round the tunnel head is formed of iron girders covered with iron plates, so that when a truck [described elsewhere as resembling a scoop on wheels] is hoisted up it can be run off the floor of the cage and along this landing to the feeding-doors through which the contents can be shot down with the greatest ease...

In a northerly direction and closely adjoining the pig bed, furnace etc. - is a large square chimney stack, upwards of a hundred feet [30m] high and fourteen feet [4.3m] diameter at the base, which carries off smoke from the fires of the steam boilers and waste hot air - both are conveyed to it by underground flues. Then there are coke ovens, charcoal kilns, and brickfields. To the south are some thirty neat wooden cottages occupied by employers. The manager's residence and office is in close proximity to the works... If circumstances warrant three more furnaces will be built.[30]

British and Tasmanian Charcoal Iron Company Mine
(*Illustrated Australian News* 10 August 1876)



British and Tasmanian Charcoal Iron Company
Tramway
(*Illustrated Australian News* 10 August 1876)

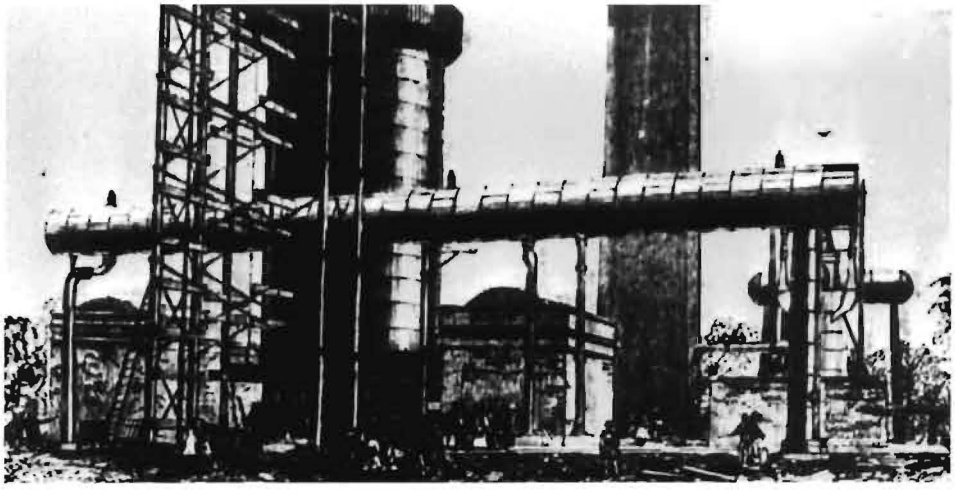
The formal opening took place in the middle of June. It was a lavish affair. Victorian shareholders were brought to Lempriere on the P & O's RMSS *Avoca*. There were fifty-five passengers in all including two Melbourne reporters and artists for the *Sketcher* and the *Illustrated Australian News*. The same number of passengers arrived from Launceston on the tug *Captain Smart* which was decorated with St. George's ensign on the stern, the Union Jack at the bow and, because the governor was on board, his flag which was a Union Jack with a lion in a wreath, was at the foremast head.

Five wagons especially equipped with seats for the occasion were hooked to the new 140 h.p. (104kw) locomotive as was a carriage 'of natty description' prepared for the vice-regal party. The locomotive, which had a 10 inch (25cm) double cylinder and four wheels was built by Messrs J. Barclay & Sons of Kilmarnock. It was described as a 'little engine' and a 'well-finished machine carrying a saddle bag water tank.. admirably adapted for the work which she is intended'. About twenty side-tipped mineral waggons made up the rolling stock. These were designed by Robert Scott and constructed on site with imported wheels and axles, and black-wood and pine bodies.[31]

In 25 minutes the guests had reached Mount Vulcan, where Mr Scott had a blast fired to demonstrate the richness of the deposit. Afterwards a sumptuous luncheon was served on board the *Avoca* under a capacious awning lined with coloured bunting. Mr. W. K. Thomson, Chairman of the Board presided and W. G. Lempriere (after whom the township was named) was Vice-Chairman. Among the guests were the mayors of Launceston, Hobart and Melbourne and several members of parliament. Toasts and moving speeches of self congratulation filled the afternoon.[32] His Excellency Governor Weld said that he had seen that day a mountain of iron which if turned to warlike weapons would be sufficient to demolish the earth, but if converted into the more peaceful weapons of ploughs, agricultural implements etc it would tend to make this colony advance. He then quoted rather cryptically, 'The perils that environ the man that meddles with cold iron' as if he had some intimation of the future of the iron works.[33]

By September forty coke ovens had been built, each capable of producing a ton of coke daily.[34] The coal was brought from Bulli NSW, and the flux from the Don until limestone quaries were organised on site.[35] The new jetty was out 60 feet [18m] from One Tree Point with rails being fixed for the entire length. It ran to a depth of 19 feet [5.8m] at low tide and was fixed to about 500 piles. It was the first railway jetty in Tasmania but, the *Cornwall Chronicle* commented: 'They have been well taxed for their audacity'.[36]

British and Tasmanian Charcoal Iron Company Works
showing workers' cottages
(Tasmanian Archives)



No 1 furnace with heating ovens etc.
(Tasmanian Archives)

Within two months the furnace was in full operation. In the first fortnight over 600 tons of first class pig iron were produced. The furnace was working well, although not yet in 'temper' it was expected to do better once run in. It was being tapped thrice daily and yielding cash of between 12 and 18 tons of iron.[37]

Foundry pig iron, white hard iron and Spiegeleisen (used in the manufacture of Bessemer steel) were all produced. The first shipment of 100 tons was loaded onto the *Argyle* on November 14th.[38] The following day sixteen men arrived on the *Derwent* to work the iron mines bringing the number employed to about one hundred.[39] In December it was decided that the furnace needed cleaning out. By extinguishing the fires with a partially reduced charge of ore it was duly 'slaughtered'. Unfortunately when the furnace was ready for refilling an accident occurred. Nine trucks each loaded with about 5 tons of ore were waiting under the shutes at the mine, for the locomotive to take them to the furnace. As they were being shunted they managed to get away, increasing in speed to 50 or 60 miles (80-95km) per hour. Two miles (1.25km) from Port Lempriere they came into violent contact with the engine which was coming the other way. All the trucks were annihilated. Because these trucks were vital for keeping the furnace going, work had to be suspended until they were replaced. This resulted in several hands being laid off.[40]

The company had by this stage produced between two and three thousand tons of pig iron. Already it had become apparent that the chrome content rendered the Mount Vulcan iron rather brittle for founding purposes, but it was believed that it would be valuable for certain English manufactures. To this end a considerable amount of iron was sent to England for testing.[41]

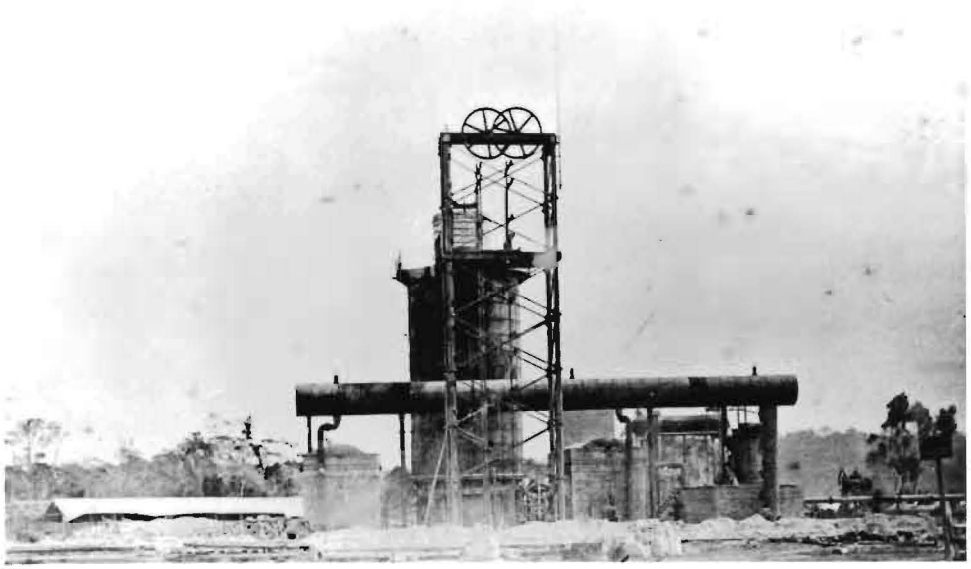
On February 19th 1877, a fortnight after the furnace was relit,[42] the *Cornwall Chronicle* in its Home Letter editorial called the attention of all those engaged or interested in the iron trade, to its leading columns. The British and Tasmanian Charcoal Iron Co has had a large blast furnace at work for a considerable period and besides manufacturing grey and forge pig iron of very excellent quality, which is commanding a high price in the colonial markets, they have produced an article, we believe altogether new to the trade but which is likely to become of very great commercial value when its properties are sufficiently known. We allude to chromic pig iron, or pig iron impregnated with the mineral chromium, which seems to have the effect of converting the ordinary product of the furnace into almost cast steel. When the first samples of ore from the Company's mine were analysed the presence of chromium oxide was noted by several of the analysts, but it was in such small quantity as not to be likely to effect the iron produced. One analysis gave trace only, another 0.96 in 100 parts, and a third 1.20 in 100 parts. Since the mine has been worked, however, the chromium oxide is found in greater quantity impregnating the ore, and various samples of pig iron tested have been found to contain 2-10 per cent of chrome. From this iron very fine cast

steel has been made in Melbourne and experiments are now going on to test the quality of the iron for puddling, the result of which will shortly be made known. Of the pig iron a considerable quantity has been used at Langlands Foundry, and some splendid castings produced, in fact for stamper heads and shoes, false bottoms for quartz crushing apparatus, and all purposes requiring great hardness and toughness this iron is found superior to any that has yet reached the Victorian market. The ore is a hydrated peroxide of iron, commonly known as brown hematite, and it is largely mixed with magnetic iron ore. It yields from 60 to 80 of peroxide of iron, with from 15 to 30 of protoxide of iron, the remaining ingredients being chromium oxide from 2 to 10 per cent, manganous oxide a small percentage, with small proportions of alumina lime and silicious matter. Traces of sulphur and phosphorous have been found in some samples, but the quantities are very indefinite, indeed the ore might be said to be practically free from those impurities. This ore is smelted in a large blast furnace producing from 250 to 300 tons of pig iron per week. The fuel used is dense hard coke made on the works from coal imported from Bulli New South Wales, the flux is a very pure mountain limestone found at the River Don, Tasmania. The hot blast is used, the furnace is cast three times daily, and the cast ranges from 12 to 14 tons. We give these particulars as to the ore and the manner of its treatment, because they are necessary to enable those whom we now specially address to arrive at fair conclusions as to the probable value of the project. Various analyses of the iron have been made, but we are not in a position to give them at present. Upwards of fifteen hundred tons of the chromic pig iron have, however, been shipped to Messrs James McEwan and Co. of London, and will have reached England by the time this paper arrives. That firm will be in a position to exhibit the iron with analyses, and to give all information respecting it to those who may desire it. We believe that it will be found that this iron when known, will take very high rank in Europe, and from what we learn it will be worth a certain price per unit of chrome, over and above the highest market price of ordinary pig iron. It seems admirably adapted for the manufacture of rails, and its steely properties recommend it for all purposes where strength is required. We believe the Ordnance Department will find it about the best material they have yet had submitted to them for the manufacture of shot indeed it is not unlikely that it will cast shot as hard as that now obtained from ordinary metal without the expensive chilling process. For armour plating too this metal should be found very superior, and no doubt it will shortly find its way into our arsenals. At present, however, it is quite new to the market, and our object in thus calling attention it is to induce those in the trade, and officials who may be interested, to see the metal and to judge for themselves. While chromic pig iron is a new product, however, the association of chrome with malleable iron is not so, and for years past the ore known as chromate of iron has been imported from Bare Hills, near Baltimore, for the very purpose of alloying the iron in the manufacture of steel. In America the process is largely carried on, and is thus described by Osborne, under the head of "Chrome-

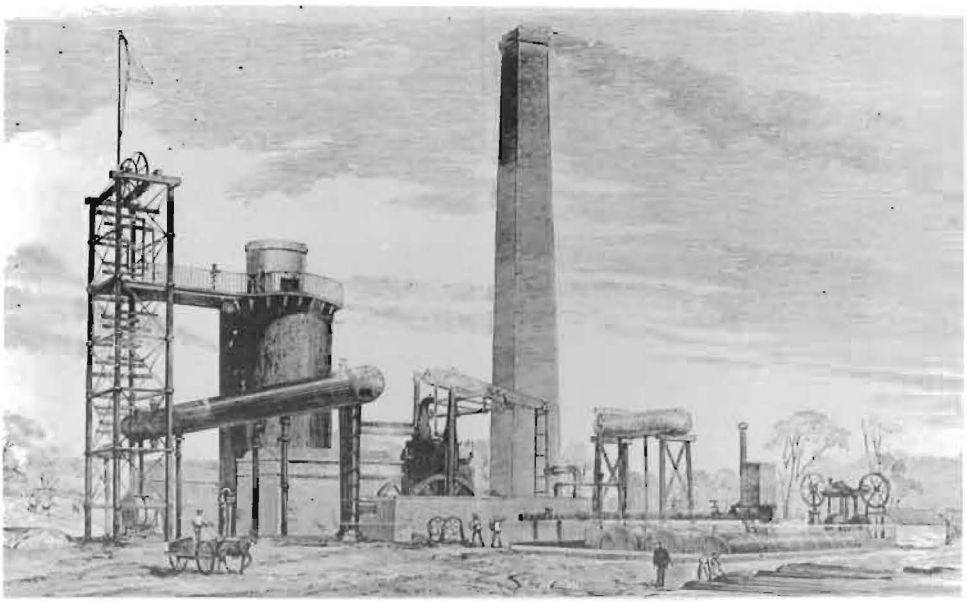
iron Steel", page 913, Metallurgy of iron and Steel - "The malleable iron of proper purity is melted in crucibles capable of sustaining great heat. Some four or five per cent of the chromate of iron is then added, according to the described temper, being scattered carefully, or simply dropped into the crucible when the latter is used, the contents are then properly mixed and cast... This steel is certainly remarkable. We have seen it welded in a short bar upon itself - drawn out, tempered, and used as a cold chisel upon cast iron without the slightest difficulty, and entirely without the use of any flux whatsoever". The average tensile strength of this steel proved by experiments made upon twelve bars showed 180 000lb per square inch [1240 200 kPa], whereas the highest strength of ordinary steel, given by Percy, is only 132, 909lbs per square inch [915 743 kPa]. The highest tensile strength of the chrome iron steel was 198 910lbs per square inch [1370 490 kPa]. This steel is now manufactured largely by the American Tool Steel Company of New York. Such is the effect of chrome upon steel manufacture in Tasmania we do not import our chromate of iron, it is already mixed with the raw material, and we believe the chromic pig iron now produced at Port Lempriere will be found readily convertable into a metal fully as strong as the chrome-iron-steel, and suitable for many purposes for which steel is now used, at a cost very much under the price of that material. We await with much interest the result of the shipments that have been made, and once more call special attention to them.

There were one or two teething problems. Towards the end of February smelting operations had to be stopped again; this time because the boilers had become so encrusted from the use of saltwater that they had become unsafe. The *Examiner* remarked that as the water at Port Lempriere was so excessively salty, perhaps one day the manufacture of salt would be undertaken in the locality.[43] To overcome the problem earthenware pipes were laid down to a place where fresh water was abundant about a mile away. James Scott M.H.A. re-lighted the furnace on March 13th. So much had been stockpiled during the fortnight the plant was out of action, that several mining staff were retrenched.[44]

During its brief prime the plant was visited by 'an Excursionist' who witnessed the 10pm cast. 'I saw eight beds of sand, the divisional forms being termed sows of some 10 feet [3m] long. The cross sections between pigs some three and a half feet [1m] long. Well at 10p.m. the manager was at his usual post, and the hoist, which by means of steam raises a lift to the top storey of the 50 feet [15m] furnace, and then lands there on sound sheet iron, is all but silent in its operations. A dozen may step on, and whether a Governor General or a lighter weight, away it goes right to the top. Arrived at the summit the prospect is not enlivening; square apertures from furnaces fiercer than those which Nebuchadnezzar invented are visible. The prismatic hues, the colours which cannot show to advantage each in the light of



British and Tasmanian Charcoal Iron Company
(Spurling)



Elevator

Brick Stoves

Furnace showing tunnel head and feeding door

Blowing engine and fly wheel

Boilers in Brick Pit

Donkey engine

(*Illustrated Australian News*, 29 December 1875)

day, play with varied effect on the animated features of the excursionists, of whom I numbered one: Landing on the summit with a gentleman of colour, and "good looking" at that, he walked off with a coal scuttle the mere contents of which weighed 13cwt [660kg], and down one of the four apertures the contents went; then followed a mate of the other gentleman, native of South Wales, with a big scuttle of lime; another brought charcoal, and one of each went continually in with the vain hope of satisfying the insatiable, ever consuming furnace, which, however, was quited for a few moments by taking the "hot blast" off. Well, looking over that fearful parapet from which weak-minded people feel disposed to make it supply the use of the London Monument, I saw with cheek cool as usual and back red hot from the furnace, a Titan hammering away to let the contents out; hard bricks, heated 70 times the ordinary heat, are not to be had to order in this age; still you back out one of these red-hot iron portions to make way for the material the country is hungering for. But to resume. The most intensely striking sight in connection with the iron mines is that of viewing the tapping of the great furnace by night; the darker the night, the better the effect. The best position for this purpose is the top of the furnace, itself 50ft [15m] from the land where the moulds for the sows and the pigs lies a short distance from its base. On Wednesday night, 10 o'clock, I had the privilege of seeing the molten iron pouring along the sandy channel from the aperture in the brick door of the furnace, and fill the sandy moulds prepared for eight sows each with twenty-five pigs. The white hot metal looked more like molten gold in the dark night than molten iron, and when all the moulds were filled the dense contents looked like a huge grid iron, on which about twenty bullocks might be broiled as speedily as so many chickens... After allowing a few minutes for the liquid metal to set in its sandy moulds, which accommodated 13 tons of iron in the one cast, some sand was shovelled loosely over the furthest section of sow and pigs. In the day time this thin coating of sand was quite visible, but at night the red hot heat seemed to scorch it up as fast as it was thrown on. Then a hardy smelter protected from the terrible heat of the red hot metal only by a pair of heavy wooden *sabots*, or sandals, stepped on section No 1, armed with a crowbar, and by a slight prise disjointed each pig from the sow, leaving it ready for carrying off when cool enough for handling. Should this disjoining process not be performed at the proper moment, the pigs could not be severed from the sows except by main force, and the metal would break at the wrong places, making it unhandy for piling, stowing or carriage. To see those powerful iron-smelters pacing quietly over the red hot metal in the uncertain light furnished by great fire-lamps or braziers, is very suggestive of that terrible place of punishment reserved, it is to be hoped, for only Satan and his angels, and the fiery furnace in full blast close at hand enforces the similitude. After viewing these terrors for half an hour or so, for all movements at the iron mines are very rapid, it is pleasant to get away into the fresh balmy, unburnt wholesome air of the village, and then to rest'.[45]

The works remained in full operation until the end of July, 1877. Twelve hundred tons were shipped to Melbourne, but supply outgrew Australian demand, and with a backlog of between four and five thousand tons, the directors decided to cease operations until they had received a plant from England to establish a gas pipe foundry in Melbourne.[46] They estimated this would take about nine months and meanwhile advertised for sale the contents of the store at Port Lempriere.[47]

Lengthy reports on the Tamar chromium pig were received from England. Full details of these are given by T. C. Just in the *Tasmanian Official Record* 1891 (pp 460-470). Every effort was made to understand the ore. There was even an analytical chemist employed at the works, to test each charge. The chrome content was so variable that the resultant iron was unreliable.

The British and Tasmanian Charcoal Iron Co was never put into operation again. The plant was broken up and the shell of the furnace was used by the Main Line Railway for three large water-tanks. These were supported by iron columns which had once formed the elevator shaft. "Tis an ill wind that blows nobody good"., T. C. Just wrote philosophically, '- and Mr Grant got a great bargain in those materials'.[48]

Ilfracombe Iron Co.

Two prospectuses for companies were circulated toward the end of 1872, and many others were promoted. The Swedish Charcoal Iron Co had great plans to work the ground owned by Messrs Barnes and Evans, No. 5 in Gould's report,[49] but their prospectus had been withdrawn a month later.[50]

The Ilfracombe Iron Company was more successful. They selected an area at the end of the disused Ilfracombe Saw Mill Tramway about which Gould had been most enthusiastic. It is shown as No 1 in Goulds report.[51]

During February and March 1873 a number of men were employed under Captain Longden in procuring stone for the furnaces,[52] clearing the bush and cutting timber for charcoal burning. Fire lumps for the erection of a small cupola blast furnace, as well as the castings and principal parts of the waterwheel which was to drive the blast, were daily expected from Melbourne.[53] In September a correspondent wrote: 'The furnace is all but finished and fire in it. The fluming bringing the water from the dam is finished and will give a fall of about thirty feet [9m]. The waterwheel is also nearly finished and will soon be in position. A charcoal kiln some 300ft [91m] long and 13ft [4m] wide is nearly ready for the wood. The shed forming the casting house is being shingled. Some 100 tons of ore are ready for the furnace and some 5 000 to 6 000 tons of wood cut ready for the charcoal kiln... The blast is to be supplied by two small cylinders worked by a waterwheel.[54] In October there were said to be a hundred or so men at work on the site. Unfortunately their first smelting in early December

damaged the furnace and the blowing power was not sufficent. Two wooden cylinders, twice the size of the originals were constructed and a new start was made on December 16th, but without success. Work had to be suspended until machinery was obtained from Melbourne.[55] It appears that this never eventuated. The *Cornwall Chronicle* of March 23rd, 1874 remarked that operations had been entirely suspended.

Tamar Hematite Iron Co

A third enterpise, the Tamar Hematite Iron Co was established, under the management of Horatio Swift, to work the area described last in Gould's report. In January 1874 there were a number of men employed in laying a tramway erecting a jetty,[56] and building a small blast furnace.[57] The blowing cylinder and engines were manufactured in Melbourne.[58] The furnace was built close to the water's edge at the head of Middle Arm, along the lines of a Swedish charcoal furnace. The lower part was of local fine sandstone. It had four 23cm linings, two of which were of the best English fire bricks and two which of were ordinary bricks made from local clay. Between the two types of brick was a 7.5cm space. The furnace was about 6.1m^2 at the base and 12m high with a sandstone hearthstone weighing 14 tons. The upper part of the furnace was circular and held together with eighteen iron hoops 8.8cm by 1cm. Two flues were built at either side of the bottom of the furnace and these conducted heat under the hearthstone. The 30cm diameter main blast pipe connected with the air receiver had three branch pipes each conveyed to a tuyere hole in the furnace, one each side and one at the back. These branch pipes were fitted with 63cm of leather piping at the end to make them more flexible, and they were also fitted with valves to regulate the blast. Two 76cm square changing doors were situated on a charging platform at the top of the furnace. These were made of iron and fitted with chains and pullies for the even distribution of materials.[59] A 12kw horizontal high pressure steam engine was installed to work two vertical blowing cylinders each with a 76cm diameter and having a 94cm stroke worked by an intermediate gear from the main shaft.[60]

On the 31st of December the furnace was charged with wood till near the top and then with a quantity of charcoal, and limestone and iron ore. It was lit at 5pm and the blast put on. Slag was seen the following evening and on the morning of the 2nd of January 1875 the pig beds were prepared, each bearing the inscription 'T H I Co. Charcoal'. Tapping began at 10.30pm. Spectators cheered as the molten liquid poured into the 17 pigs and one sow. This produced about 600-750kg. When the iron had run the blast was cut off to enable the furnace men to stop the tap hole. It resumed after a few minutes and the furnace men with the assembled guests had their glasses charged, and gave three cheers for the

Tamar Hematite Iron Co.[61] Problems ensued because of the lack of skilled workmen, and a week after the first smelting the furnace was 'gobbed' with a couple of tons of cold metal at the bottom. A day was lost before the furnace was blown in again.[62]

By February the Company was producing between thirty and thirty five tons of iron weekly, and was contemplating the building of more furnaces.[63] On April 29th trial castings were made at Peter's Foundry in Launceston. Two tons were used for the experiment and these were cast into flywheels for chaff-cutters, tramway wheels for the Tamar Hematite Iron Co., small wheels for the Launceston and Western Railway, a screw for the *Pioneer* steamer, panels and rails for palisading, bannisters for the railing in front of what is now the Pilgrim Church in Paterson Street, portions of ovens, frying pans, spanners etc. The iron was found to be easy to melt and free from 'keish' (sulphur), and compared very well against Scotch iron in all the tests.[64]

Inspite of all these encouraging indications the company found they had to suspend operations because the works were not large enough to be remunerative and they lacked the capital to increase them.[65] There was still a certain optimism that funds could be raised, although Algernon Swift's sudden death in February 1876 lessened the likelihood.[66] There was a brief mention of a rumour that the works were to be restarted in September 1877, but in December they were offered for sale, and their attraction was their location on top of the newly discovered gold lode at Cabbage Tree Hill.

At the time of sale the works comprised a smelting furnace, charging shed, with a viaduct level and top furnace, 18.5kw engine boiler with brick chimney and shaft, a blowing engine, casting house, manager's house, store, bakehouse, forty workmen's cottages, jetty into three metres of water at high tide, and a three meter gauge tramway for the 2½ kilometres to the mine.[67]

Conclusion

When these ventures started there was a high demand for iron. In Europe there was a shortage because of the Franco Prussian war and the disruption to the development of industry that this caused. A similar situation existed in North America after the civil war and Britain was hard pushed to meet the demand. However, during the 1870s Britain began to lose her industrial supremacy and Germany, in particular, began to establish massive and sophisticated iron works. The demand for iron which had to be transported halfway round the world dropped dramatically. Within the Australian context the British & Tasmanian Charcoal Iron Works were considerable. In New South Wales the Fitzroy Iron Works at Mittagong which operated fitfully for forty years, produced 3 338 tonnes during 13 months of full operation before closing down in March 1877. The Esk Bank Works at Lithgow produced in their four years of full

operation between 1878 and 1882 9 019 tonnes pig iron. These were the only other noteworthy iron smelting operations in Australia at the time. In comparison the British and Tasmania Charcoal Iron Company produced over 6 000 tonnes of pig iron during its six months of operation averaging approximately 250 tonnes per week. This was four times the average of the Fitzroy Iron Works and six times the average of the Esk Bank Works.[68]

Only remaining building at Leonardsburgh

(8215 Tamar 55GDQ 800408)

Site of Furnace Redbill Point

Foundations Redbill Point
(8215 Tamar 55GDQ 836454)

Slag at Redbill Point
(8215 Tamar 55GDQ 83654)

Tramway site near Mount Vulcan
(8215 Tamar 55GDQ 800388)

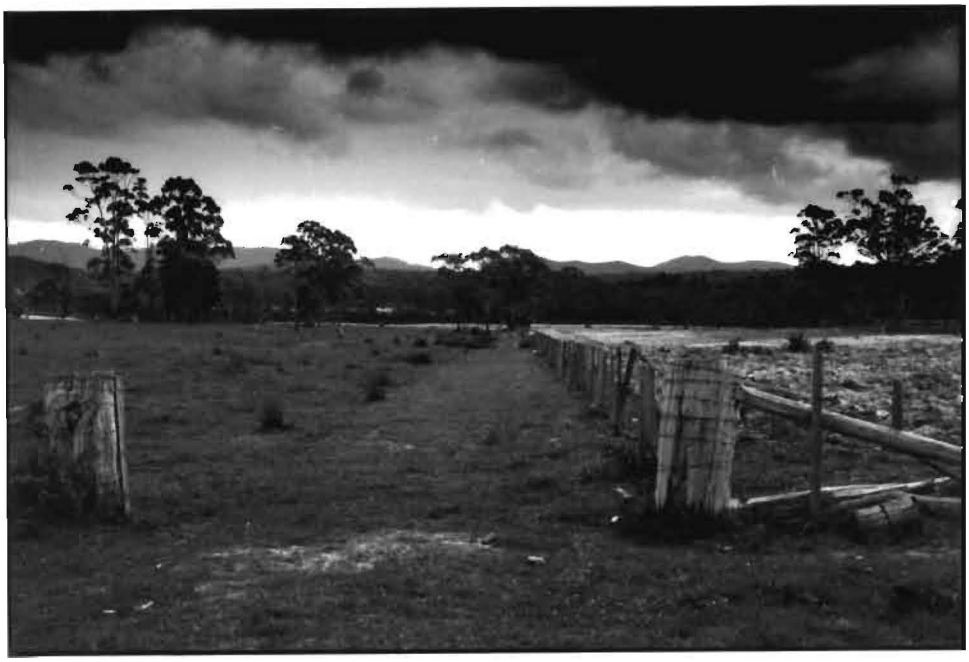
Quarry face Mount Vulcan showing pick marks
(8215 Tamar 55GDQ 800388)

Ilfracombe Iron Company Furnace

(8215 Tamar 55GDQ 55GDQ 821344)

Water race

Stockpiled ore
(8215 Tamar 55GDQ 821344)



near Swifte's Jetty
(8215 Tamar 55GDQ 862398)

Site of furnace at Swifte's Jetty
(8215 Tamar 55GDQ 862398)

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CHAPTER FOUR

GOLD - WEST TAMAR

1. Tasmania Mine
2. Chlorination Works and battery
3. Wyett's tramway
4. Moonlight cum Wonder Mine
5. North Tasmania Mine
6. East Tasmania Mine

CHAPTER FOUR

GOLD - WEST TAMAR

Discovery

Gold was discovered on the West Tamar by John Gardiner in 1847. Gardiner was employed on Gilbert Blythe's lime works, and was sinking a shaft when three feet below the surface he discovered some pieces of metal, each weighing about 3 pennyweights (17g). He didn't recognise the metal, and believing it to be mica, tossed it away. In the early 1850s he left Blyth's employ for the Victorian diggings, where, while working at Mount Alexander he realised what he had thrown away. In 1855 he returned and found gold in the vicinity of Blyth's quarry. He said that he'd applied to the government, but was informed that they did not wish to encourage gold-digging. This seems unusual as in 1855 a government appointed committee recommended that £5 000 reward be offered to anyone who discovered a payable goldfield. Perhaps it was the terms which put Gardiner off. Before a claim could be made the field had to be worked for three months, yielding an average of ½oz (14g) gold per week for each digger.[1]

Fourteen years passed before a meeting was called in the classroom of the Launceston Mechanics' Institute to discuss measures to be taken about Gardiner's discovery. It was decided that Messrs E. L. Ditcham, G. Gabriel, T. W. Thomas and T. W. Norwood would accompany Gardiner to view the site.[2] Unfortunately the area had changed somewhat and the earth dug from the shaft was not to be found. The raising of subscriptions for the sinking of another shaft was discussed at a public meeting; but Gardiner having already expended about £200 on prospecting in Tasmania was unwilling to give anything other than time or labour. The scheme fell flat and Gardiner returned to Victoria,[3] although a few Victorian miners offered to prospect there 'on terms'.[4] By the 20th of March they had, it was reported, found fine gold.[5]

In February 1870 Mr Dowlin, a Victorian miner of considerable experience, inspected the prospector's quartz claim on Cabbage Tree Hill and reported: 'I have opened up the reef in as close proximity as possible to where the gold was first discovered, to a depth of about eight feet [2.5m] from the surface. I must confess that I never have before this occasion found gold in stone of the same character. It is of a hard granite sandy nature, with small veins of quartz occasionally running through, varying in thickness from half an inch [12mm] to four inches [10cm]. The width of the reef is fully twenty feet [6m], and gradually widening out as you go down. There is fully 15 tons of shift on the ground at present,

the result of the work already done. I have discovered the presence of gold on several occasions, but it is not fairly distributed through the stone, therefore I feel sorry to say that I cannot pronounce it as paying at present. It is possible for the stone to change its character in a short distance from where we are now; however, it remains now solely with yourselves as to future operations. In conclusion, I may state that the gold is of a superior description to any I have seen in Tasmania, a sample of which I have preserved for your inspection. That the West Tamar district is a golden one, I have not the slightest hesitation in saying.[6] Later it was discovered that gold-bearing quartz had been used to build the chimney of the lime burner's hut.[7]

Brandy Creek

In March 1870 Messrs Dally discovered Brandy Creek to be gold producing. The same month the diggings there were visited by the *Examiner's* Special Correspondent.[8] In May the Ilfracombe Company was formed and seven men employed through the Brisbane Street Employment Institute were sent down on the *Rover's Bride*.[9] Mr Carnegie, who had formally been the manager of Fingal's Union Company, inspected the claim. The men were removing surface soil and exposing the wash dirt. Machinery for sluicing was being constructed.[10] A small but steady flow of gold came from the Brandy Creek diggings. No large company was formed, and consequently little machinery was installed. Because of this it was rare for anything other than large quantities of gold to be mentioned in the newspapers. Although in June 1872 it was announced that: 'A party of six Chinamen with well stocked baskets borne on their shoulders from bamboo yokes, and with tools and other appliances, left the hospitable stores of Messrs Peters, Barnard and Co [who gave many miners free lodging until they obtained their first gold] early yesterday morning to proceed on board the steamer *Annie, en route* for the Brandy Creek diggings on the West Tamar. Ah You a Chinese fisherman, arrived from Melbourne with this party last week and he proceeded to Ilfracombe with the intention of establishing a fishing station and fish-curing depôt in that locality.

In September after a yield bringing them to Launceston the Chinese held a grand festival at their Joss-house at the stores of Messrs Peters, Barnard and Co. in Cameron Street. 'Some diggers returned from Brandy Creek on Monday night by the steamer *Annie*, bringing with them a parcel of gold valued at £26 included in which was one gold nugget worth about 35s, the remainder being very fine and scaly; and although the expedition had been pronounced by John as "no welly good", they decided to return thanks to their oracles for past favors, and solicit further indulgences. Accordingly, the "welly good man" and his associates - one being a remarkably savage-looking character - were set up on high, surrounded by the thousand and one

cunningly devised ornaments and embellishments which the Chinese are so apt at manufacturing, such as fly-cages, lanterns and numerous nondescript fantastically artistic shavings and cuttings in coloured and gilt papers. On the table in front of the fortunate object of adoration were placed three or four fine roasted fowls, pork &, with a plentiful supply of oranges, preserved ginger, nuts, and other items usually included in a dessert course, together with an unlimited quantity of pure and unadulterated brandy. Prior to the commencement of the service all the Celestials present - some 20 - were busily engaged in laughing and cracking jokes with each other; but on a sign from one (whom for the sake of convenience we will dub the priest) levity was cast aside, pig tail unfastened, and a semi circle formed around the altar...[11]

Although there was a constant flow of gold from Brandy Creek, there was no great flurry until October 1876 when the *Examiner* announced: Great excitement has been caused during the month by a rush in the Cabbage Tree Ranges... and a great many claims have been taken up there. There is a reef, apparently well-defined and Milner and Party who have the claim adjoining the prospectors are working at it and intend to sink a shaft 40 feet [12m] to test it. The reef is 2 feet [60cm] thick, with fine gold diffused throughout the stone, the highest prospect obtained from hand crushing having been 2grs [133mg] to 4lbs [1.8kg] of stone.[12] A further alluvial gold field was discovered in January 1877 one mile south-south-west of the Tamar Hematite Iron Co's works.[13] However, it was Dally's find, in July 1877 which the district mining registrar pronounced to be the richest ever found in Tasmania, and which started the rush that was to transform Brandy Creek's few mining tents to the third largest township in Tasmania.[14]

A month later 'Under the Verandah' visited the diggings after hearing 'a good deal of Brandy Creek - fabulous accounts of the wealth lying within a few feet of the surface were wafted to my ears; but when I saw in black and white that nearly 50oz [1.4kg] of gold had come from there, the result of a fortnight's work with very primitive appliances, I determined to go and have a look at this new "El Dorada" for myself'. In the winter drizzle he set out for George Town on the steamer *Corio*, spent the night at a lodging house and set out for Brandy Creek the next day, landing at Swift's Jetty. 'After a wet tramp of a couple of miles we came to Dally's prospecting claim. Some of us went there unbelieving, but we came away converts. It is without exception the best thing (judging from the present look of it) at present in Tasmania. The claim lies on the slope of Cabbage Tree Hill, and the reef has been cut and exposed in seven places, starting at the west boundary to within a few yards of the next claim of 10 acres [4ha], called the Florence Nightingale. On the western part the stone is very soft and friable, but it gets harder and darker towards the eastern end. The main thing is, however, that it carries gold right through. The Messrs Dally kindly allowed us to pick up a few specimens, and they were very rich. No systematic work has yet been done on it, the proprietors confining themselves to proving their property by

Beaconsfield. 1882
(Tasmanian Archives)

cross-cutting. The battery will have to be erected about a mile and a quarter [2km] off, where there is permanent fresh water and an easy incline down to it. Altogether I congratulate the owners of the claim on the fine prospects they have. It is not their intention to float it, but to work it themselves; in fact I heard that they shut up an anxious would-be-purchaser who wanted to know what they would take by saying £100 000.

We had not much time to spend there, but we saw quite enough. The country is pegged out in all directions, and everyone who has a claim says he is next to Dally's, whether it is on the line of reef or not. Undoubtedly the best claim after the prospectors' is the Florence Nightingale, as the reef is cut within a few yards of their boundary and runs right into it; after that at the back to the eastward the Dally have pegged out more claims. The reef runs east and west as nearly as possible, and on top of the hill to the west there are seven men's ground which will yet be valuable. Of the other claims the Duke of Edinburgh is thought a good deal of, but very little work has been done yet, and they have yet to prove themselves; while there is no question of the reef in Dally's claim. There are about 40 men employed now, and there is every prospect that Brandy Creek will yet be a cozy and thriving place.[15]

Interest was so aroused, an excursion trip was organised. One hundred and thirty people were keen enough to be at the Launceston wharf by 6.30a.m. The tug arrived at Middle Arm five hours later and the passengers were landed by boats opposite Bowen's Jetty, and then proceeded on foot. 'The first objects of interest were the silent smelting works of the Tamar Hematite Iron Company, the numerous wooden cottages once tenanted by their employeś, and the well laid tramway with piles of firewood standing at intervals along it, which was used for bringing down the ore and fuel to the furnaces at the water's edge. A walk of a mile and a half [2km] through open swampy flats, bearing a profusion of heath in full bloom, grass trees and cutting grass for scrub, lightly timbered with peppermint and bull oak, brought the visitors to the sluicing boxes of the Messrs Dally on Brandy Creek. The stuff is carted from the claims on the Cabbage Tree Range about a mile away, sluiced here, and the quartz forked out is put on one side for future treatment, it being very rich. A good deal of gold must, however, be lost in the tailings here, and as the mine is further developed a more systematic method of working will be adopted. North of this point and not far distant, is the Duke of Edinburgh claim, upon which working operations have been carried on for several months. There is a reef opened out upon it, running east and west, but it will have to be further tested before an opinion can be expressed upon its value. Several other claims in the vicinity have been taken up, but are not worked yet. Proceeding onward from the sluice-boxes we soon begin to ascend gradually for the best part of a mile which brings us to Dally's reef, nearly at the top of Cabbage Tree Range. This is a low range running nearly north and south, about two miles [3.2km] inland from Middle Arm and

Beaconsfield: Tasmania Mine
(Australia: The first hundred years)

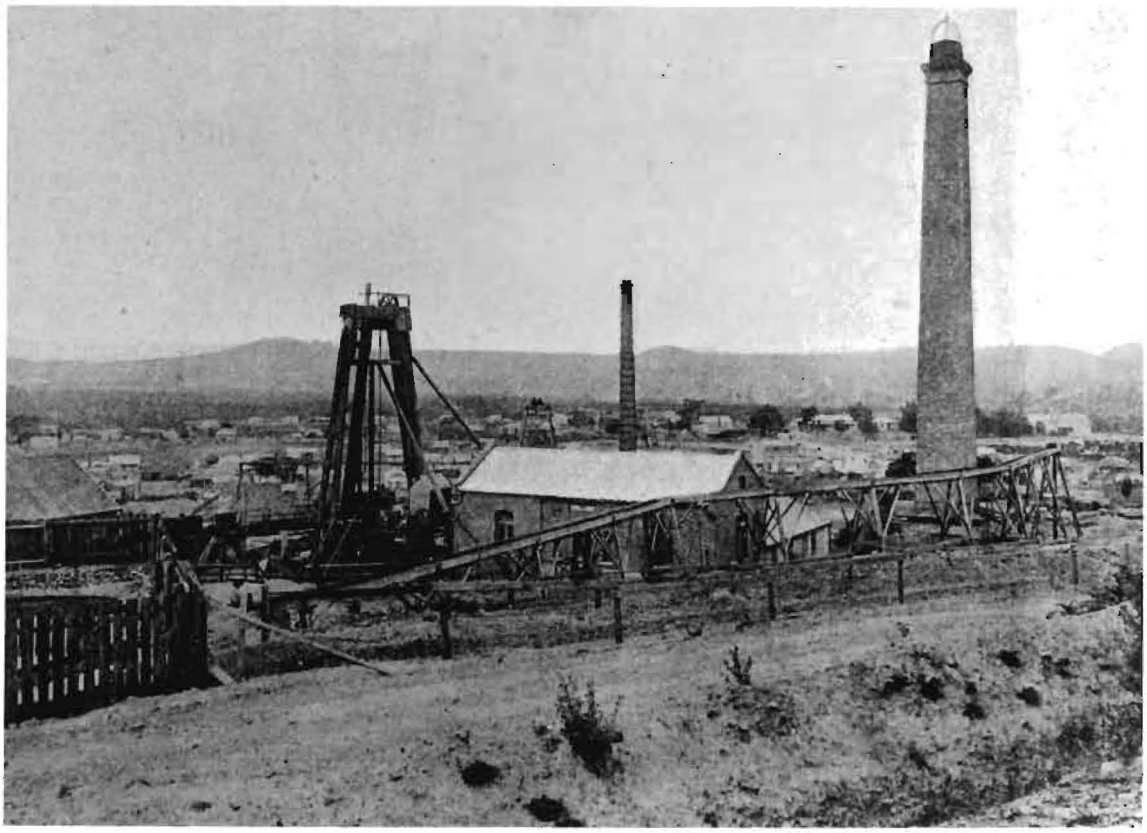
parallel to it. Across its northern end runs Brandy Creek, and the range extends southwards for several miles. Gold was first found at its northern end in 1869 on a tributary of Brandy Creek by the Messrs Dally, but the alluvial deposit was not very rich and some Chinamen who were there in 1871 were the last persons working it. The valuable reef recently discovered by Messrs Dally is about a mile south, on the eastern slope of the Cabbage Tree Range, and there are now 42 claims, representing 395 acres [160ha], under application for registry, besides a large area taken up under miners' rights, which is not registered, in this last being the five ten-acre [4ha] claims which the Messrs Dally hold amongst them. There are at present on the field over two-hundred men; the Messrs Dally employ 47 men and 14 teams, some of the miners are prospecting their claims, a good many are shepherding ground or waiting for an opportunity of securing some, and a few are prospecting to the westward near Blue Hill and in the open country lying towards Port Sorell. On Tuesday the goldfield presented a busy scene; besides the residents and the strong muster of excursionists by the tug, there were a great many persons present from George Town, various parts of the West Tamar, and Launceston residents who had come down overland, so that there must have been at least four hundred people on the ground...

There is at present neither store nor public-house on the goldfield as yet, the miners drawing their supplies from neighbouring farms and the stores at Ilfracombe, three or four miles [c4-7km] away. A building intended for a store is now in course of erection by Mr Stonehouse at the foot of the range, and if matters go ahead as they promise to others are likely to soon follow suit'.[16]

Although the township appeared to be progressing rapidly there were problems on the fields. The government was being exceedingly slow in providing licenses. Whereas in Victoria facilities were provided for miners with full information and prompt registration, Tasmanian authorities dithered while miners, who had pegged out their claims and paid their fees, had spent their last shillings waiting for the registration to come through.[17] This enforced idleness caused problems. Gambling was a nightly event in some of the tents, and winners were attacked on their way home. Many of the Victorian miners returned to their own colony unable to wait any longer.

The problem was exacerbated because so much gold-bearing land was still held under iron-mining leases. The Tamar Hematite Iron Co's land on the Cabbage Tree Hill was known to be covering the main reef. Miners eagerly awaited the sales of the works when the lease which should have lapsed anyway through non-payment, would revert to the Crown and be available for gold applications.

Tasmania Mine



(*Australian Mining Standard* 1 July 1898)

In 1878 the Tamar Hematite Company was purchased by Adye Douglas M.H.A, William Dawson Grubb M.L.C. and a few others. The sales of the company took place on the same day as a new Mineral Lands Act was passed. This Act entitled the purchasers of the iron lease first option on a gold-mining lease.[18]

According to the Goldfield Regulations applications for leases were to be displayed on the land in question in a prominent position for thirty days.[19] Grubb and Douglas's application was discovered by Brandy Creek miners one day before a caveat had to be entered in Hobart. The application had been back-dated, allowing no time for any objections to be lodged.[20]

Not content with the 10 acres (4ha) lease allowable under the Mineral Lands Act, Douglas sought permission to lease 80 acres [32.4ha] for gold and succeeded in getting it.[21] This later became part of the lucrative Tasmania Mine.

The *Examiner* was strongly in support of the working miners, one of whom wrote to the Editor:

'Sir - You deserve the thanks of the mining population of this colony and particularly those of Cabbage Tree Hill, Brandy Creek Goldfields, West Tamar, for your very able and independently written articles, reviewing the various clauses in the Mineral Lease Act. You have hit the right nail; drive it home. Why should mining speculators be allowed to monopolise a large and promising gold field? Your readers are aware that default has been made in the payment of rent by Benn and Cunningham, lessees of the Tamar Hematite Iron Co's land at Brandy Creek. The right, title, and interest in the lease were submitted for sale by the mortgagees, not the Government. The sale was to have taken place in November, but was adjourned until the 10th, the very day the new Mineral Leases Act passed into law. Strange coincidence this! only known to a few. The mining ring know all about it - M.L.C.s M.H.A.s ex Mayors, men possessing powerful influence, and others whose names have not yet appeared; all longing for a finger in the Brandy Creek pie.

> And when the pie is open they
> will all begin to sing
> Won't it be a dainty dish
> to lay before our mining ring?

The next little song the ring will sing on their way down -

> We are off to Brandy Creek,
> early in the morning, early
> in the morning
> Give our best respect to the
> Florence Nightingale,
> And tell her we will be with
> her at the Signing of the Lease.

X Main shaft
Tasmania Mine

O Bonanza shaft

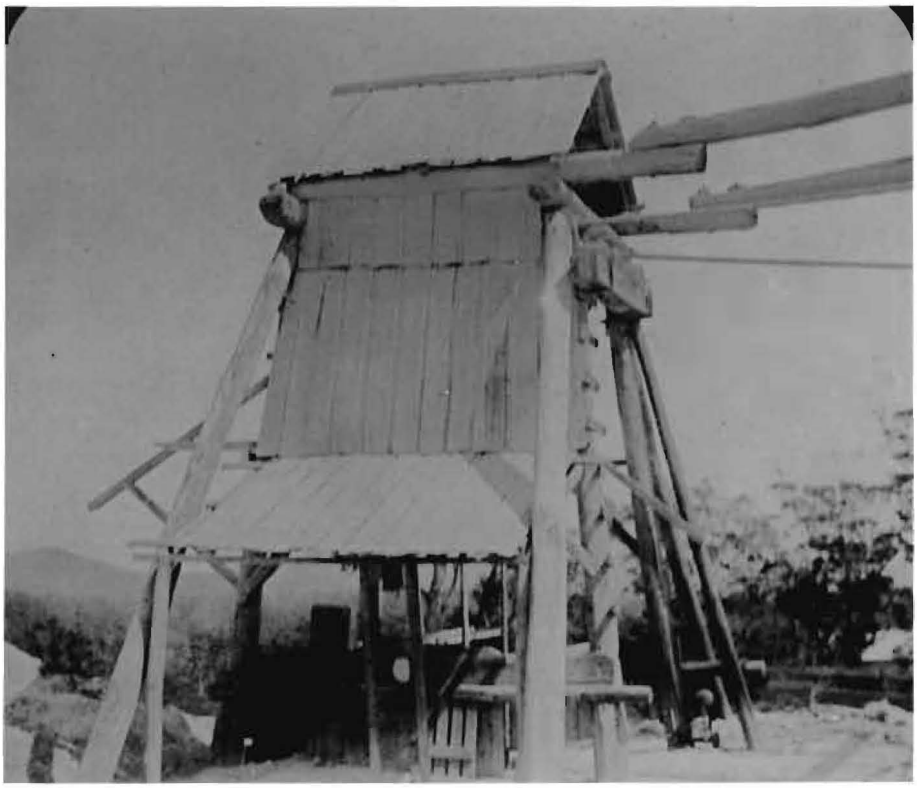
* Hart shaft
Tasmania Mine

Is there not a clause in the Goldfields Regulation Act, which will uphold the Minister of Lands in refusing to recommend or sign the lease, default having already been made by the former lessee in paying the rent. The demand of the new purchasers is a modest one, two hundred and thirty-eight acres [95ha] or more for gold mining as well as mineral purposes [upon] a proclaimed gold-field to one Company. If the contents of the said Act were known a good many would like to have their fingers in the pie...[22]

With the waning of alluvial gold the militant and independant miners moved to more promising goldfields, and with them went the demand for fair dealings. In March 1878 an *Examiner* reporter wrote: 'The total population of the goldfield, including miners, business people, laborers, teamsters, women and children is over 500 souls. With the exception of a few who live at the Western side of the Cabbage Tree Range, and those who live in the numerous huts at the Tamar Hematite Iron Co's works, near Middle Arm, the population is clustered on either side of the portion of the main road from Launceston half a mile [800m] in length, and the residences comprise almost every description of dwelling from neat weather-board houses, through the gradations of paling buildings with glazed windows, ditto with calico windows, ditto with no windows, "bulls wool" (stringy bark) huts, log and chink ditto, down to the miners' tent and fly of calico or duck, these last being very numerous on the mineral lease. The township begins with an hotel and ends with one, Mr W. Titmus's house on the mineral lease being the first house entering the road from Launceston, and Mr J. T. Dowlin's, on Owen's Freehold, now the property of the Ophir Company, the last house at the northern end... To supply the numerous wants of the residents there are two public houses, one Temperance Hotel, five stores on the goldfield and two at the iron-works, four butcher's shops, a bakery, two boarding-houses, two blacksmith's shops, a timber yard (supplied from the Mersey by crafts), a post office, and... a Wesleyan Chapel, erected and paid for by public subscription'.[23] The latter was an indication of emerging moral standards of the town. By 1879 Brandy Creek was felt by temperance advocates to be an unsuitable name for a town and in March of that year it was officially named Beaconsfield after the English Prime Minister.[24]

Beaconsfield

By September 1879 there existed three churches, four hotels, six or seven general stores, 262 dwellings and a population of 962. Already it was twice the size of Nine Mile Springs. The alluvial gold was all but exhausted within two years of its discovery, and many independent miners had left. Others formed companies so that they could raise the money for the machinery to mine rather than prospect.[25] Certainly the overall population did not diminish, by mid 1880 it had reached 1 150[26] and a year later it was in excess of 1 600. Substantial buildings were now being erected and lots of land in good positions sold at £500 per acre. Eight steam batteries and one water battery powered 118 heads of stampers on the field.[27]



West Tasmania Gold Mine

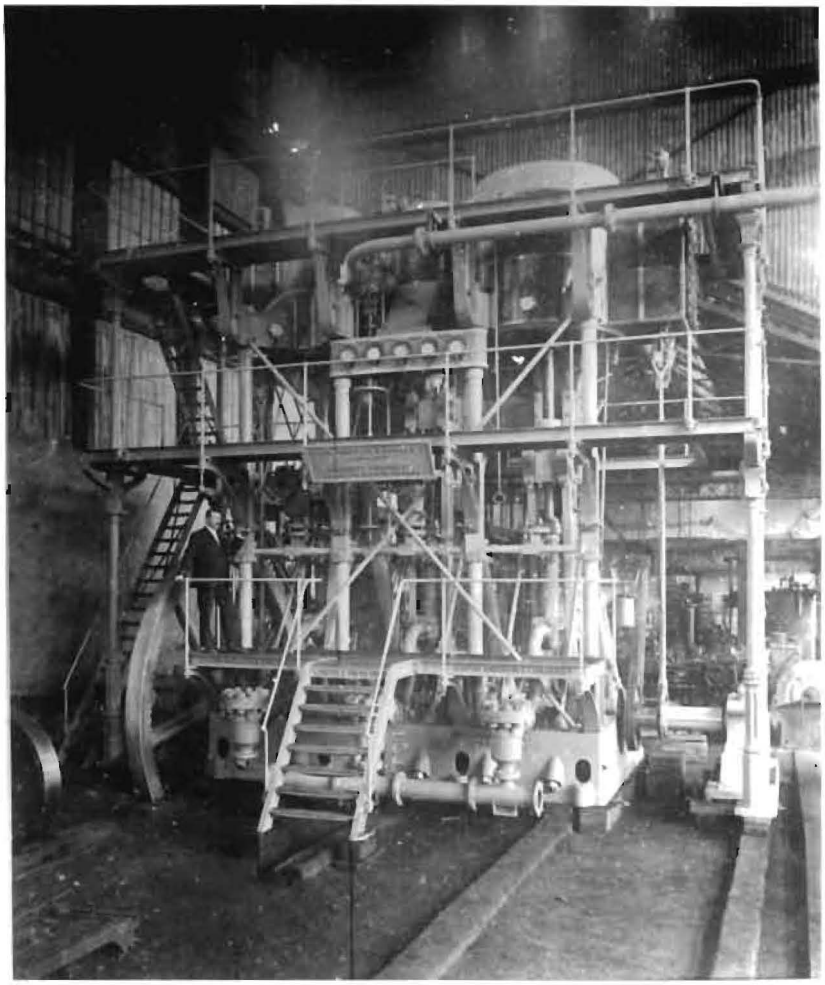
As well as the Tasmania, the Florence Nightingale, Eldorado, Leviathan, Ellis' party, Phoenix and Nil Desperandum all had steam operated machinery at this time, and only the Port Philip Gold Company used water with a 25 h.p. (18.65kw) wheel.[28] The rush saw the mushrooming of companies; over seventy were registered in Beaconsfield alone in 1881.[29] Many of these were quite short lived and destroyed investors' confidence in Beaconsfield. By 1886 Commissioner Glover was pleased to note: 'I cannot but feel impressed with a conviction that a manifest revival of enterprise is steadily setting in, and this without the spurious impulse which characterised the so-called mining operations of the past. In proof of this I may cite six claims at Beaconsfield along viz the Cosmopolitan, Little Wonder, the Moonlight, Dally's United, the Denmark, and the Ophir, which, having for a very considerable time laid almost dormant - some of them entirely so - have, within the last few months, resumed operations, and, either under new and more enterprising proprietors, or for other causes, undergone a wholesome change to energy and *bona fide* purpose. These mines, which a few months ago were silent and all but deserted, are now emitting the sounds of the steam-whistle and the rattle of machinery...'[30]

As Commissioner Glover wrote there were only ten registered companies at Beaconsfield and the situation did not change until 1890.[31] However the amount of gold retrieved in 1887 was up one third on the previous year.[32] Most of the mining companies had hitherto been locally financed but from 1887 financiers further afield began to take an interest. The sums involved, mainly due to the pumping equipment required, had exceeded Tasmanian resources.

The flooding of the goldfields and subsidence of land was seen as so remarkable that in 1888 the manager of the Tasmania Mine presented a paper to the Royal Society entitled 'Extraordinary Phenomenon at Beaconsfield'.[33] The Sydney financed Ophir mine erected powerful pumping machinery in 1888 and the same year saw the amalgamation of the Tasmania Mine with the Florence Nightingale, Lefroy, and Dally's United Gold Mining Companies,[34] although numerous problems with their pumping machinery resulted in a disappointing yield.[35] Moves were made to procure adequate machinery from England.[36] The main shaft was enlarged to receive the new equipment.

The Tasmania Mine

By March 1892 the water of the mine was conveyed to a cistern at the bottom of the new shaft. The cistern or trough was of wood divided into three compartments. Gravel and dirt gathered in the two outer sections and clear water ran through to the wind bores in the centre. A chamber, 18ft (5.5m) long and 40ft (12m) high



Tasmania Mine. Pumping machinery

was cut at the bottom level of the shaft to receive the cistern and the plungers. Because of the quantity of water two sets of pumping rods and two plungers were installed to pump the water to the adit. There were also two sets of pumps from the bottom to the 200ft (60m) level but at that point a Y piece combined them and one column took the water the rest of the way. On the ascent of the plunger in the pole case the water from the cistern was made to rise through the windbore and valve or clack (valve) into an H piece above. When the indoor stroke of the engine or upward motion of the pump rod to which the plunger was attached was completed the bottom clack closed confining the water. With the downward motion of the pump rod and subsequent descent of the plunger the water raised the top clack in the H piece and was drawn into the pumps above where it was delivered to another cistern at the 200ft (60m) level by collar-launders. The same operation was repeated and the water was released into fluming at No. 2 tunnel or adit, and conveyed through the mouth of the tunnel to a dam some distance away. The pump rods reached from the surface to the bottom of the shaft and had plungers attached to them by means of "glands" and "set-offs". The pumps themselves were made with eighteen foot (5.5m) lengths of steel plate and half-length matching pieces. They were 24ins (60cm) in diameter and capable of lifting 384 gallons (17.46hl) of water per stroke. Working at ten strokes a minute 5 529 600 gallons (251 380hl) could be raised daily, using 5 tons of good coal.[37]

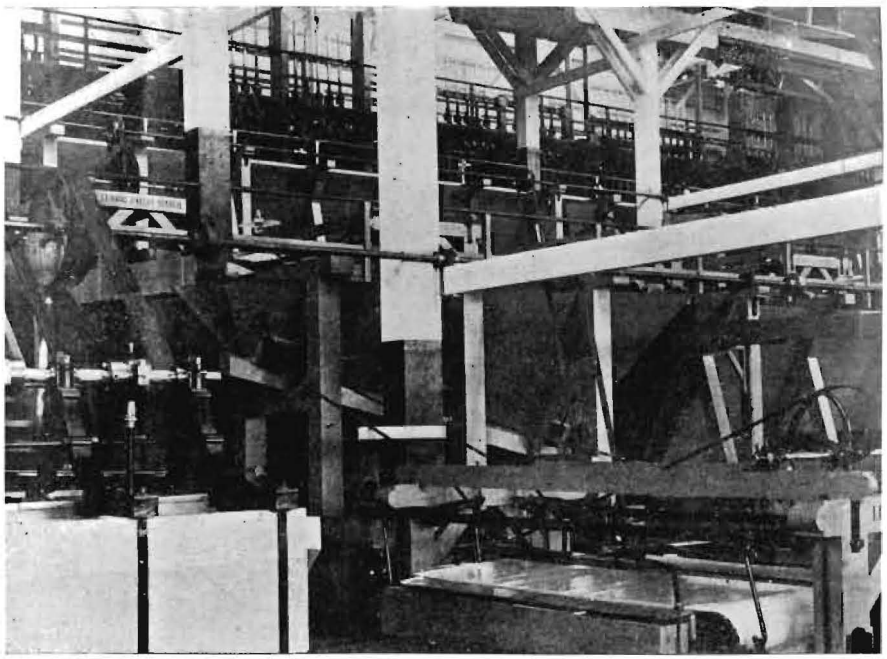
Contrary to the belief of one of Beaconsfield's residents, that the new plant would so shake the township it would be like living in a constant earthquake, the ungeared machinery was relatively unobtrusive.

At this time shareholders were becoming concerned at the amount of money being invested in machinery with no tangible results. At the 29th half-yearly meeting of the company there were accusations of bad management, and by January 1894 the meetings had degenerated into a slanging match.[38] Shareholder, Mr Jolly said the Tasmania Mine battery was one of the worst in the colonies.

A gold strike a month later generated new optimism and a new concentrating plant was ordered from Germany.[39] G. Simpson Pitcairn came to Tasmania to instal the new Luhrig plant. A building to house it was completed according to a design given to the company in September 1894. The appliances which arrived on the 7th June of that year included 6 patent (Pitcairn) classifiers, 34 clarifying Spitzkasten, 2 fine jigs, 5 compartments, 40 of the latest improved Luhrig vanners and all the necessary shafting etc. All these were near completion by August 1895 in conjunction with the latest milling appliances which included three receiving hoppers, three patent (Philips) improved rotary crushers, storage hoppers for sixty-five heads of stamps, 13 improved automatic feeders, nine new and improved stamper boxes, shifting, counter, shifting and connections, all of which were housed in a 53ft (16m) high building on the site of a lean-to and quartz paddock.

Tasmania Mine Concentrating Works

(*Australian Mining Standard* 1 July 1898)



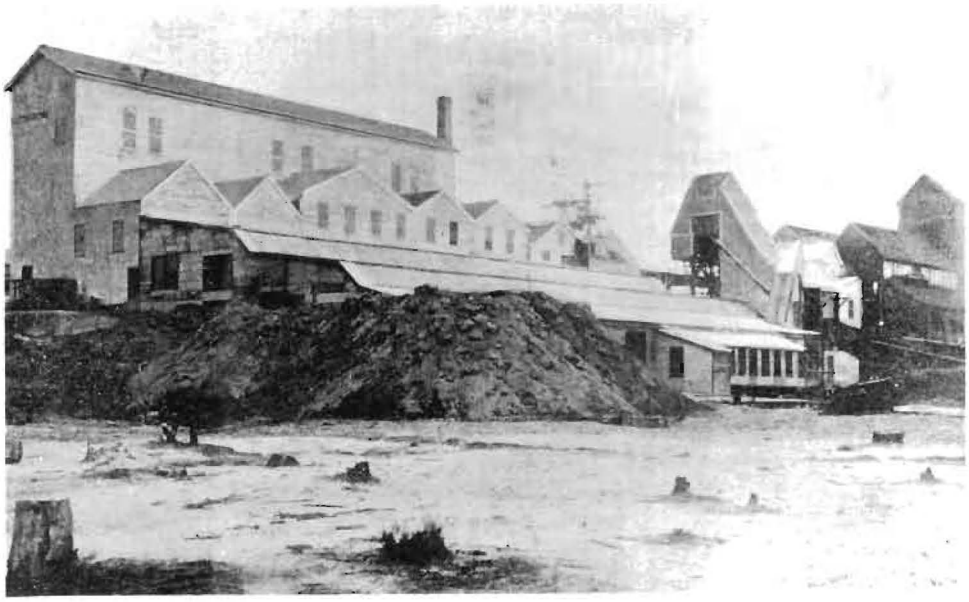
Pitcairn also supervised the overhaul of the battery which he found in an advanced state of disrepair. Nine of the old boxes were unfit for use and the entire 65 head battery was dismantled. All the shanks were tapered to uniformity cams were forged and irrepairable parts replaced. New sprocket or lifting gear was installed. Thirteen copper tables were renewed and had 'drops' instead of their previous ripples. One of the three old boilers was discarded and two cornish ones were taken from the Lefroy shaft and installed next to the remaining two. This meant that there was always a boiler in reserve. The engine powering the stamps and rock breakers was given a new steam chest and thoroughly overhauled and two water motors were put in, one to drive the Luhrig appliance and the other the dynamo. The installation of water motors required extensive alterations to the upper dam which was enlarged to contain 9 000 000 gallons (409 748hl) of water and the lower dam had to be similarly extended to cope with the overflow. The race was lowered and cleaned. A 16in (40cm) diameter pipe-line 53 chains (1.07km) long was installed for the electricity supply. Messrs Siemens & Co had installed 110 16 candle power lamps and wires throughout the works, offices and residence, and were to extend the wiring to light the chlorination works Pitcairn was designing.

The railway and tramline were in such a state of disrepair that a new permanent way was laid to accommodate Bochum trucks.[40] A year later the concentrators had been completed and four of the vats of the chlorine plant had been finished. The directors were hopeful of a vastly improved output.[41] The following year an electric locomotive was conveying quartz from the mine to the reduction works.[42]

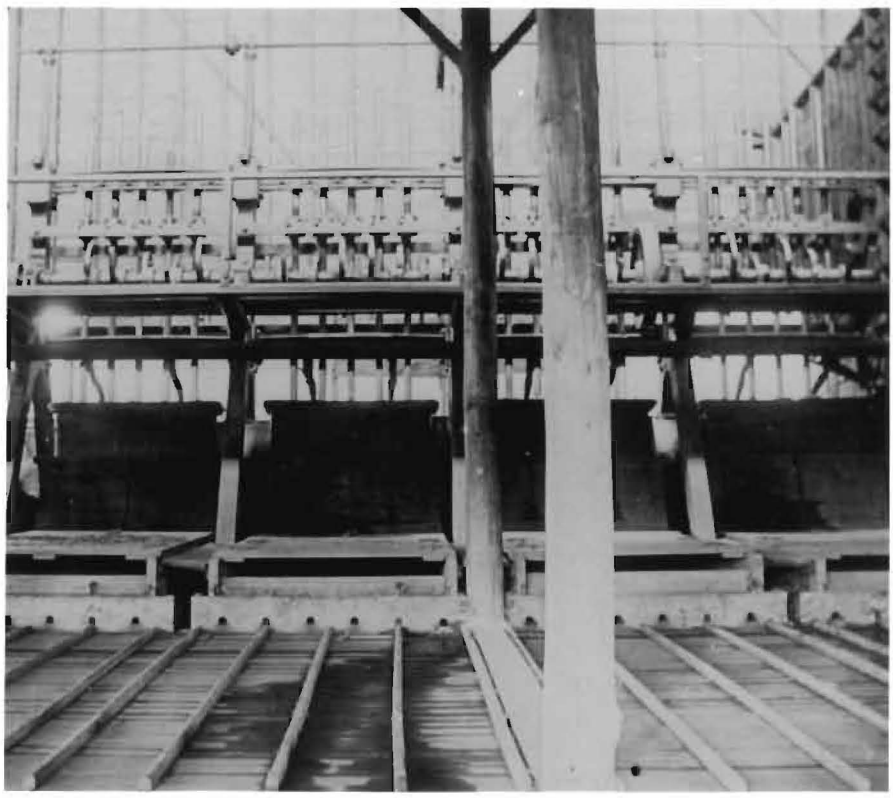
In February 1899 the Tasmania Company was spending its income on the erection of two furnaces at the chlorination plant for the treatment of concentrates of which they had 90 000 tons on hand. Two more furnaces were to be erected, and already there was a notable reduction of tailings.

A new shaft was being prepared for the machinery which had arrived in spite of an engineers strike in England and a fire on the ship *Te Koa* which was carrying it. To minimise the problems entailed transporting the machinery, they had extended the wharf and dredged the Tamar at Beauty Point. This enabled large steamers to berth there.[43]

The crushing plant was increased to 105 head of stampers capable of crushing 100 tons per day. In the main shaft a pair of Riedler pumps were installed at the 600ft (180m) level, powered by three new boilers at the surface.[44] Almost every year, however, the Secretary of Mines reported temporary checks on the output of the gold field 'owing to the abnormal influx of water'.[45] In 1902 it was decided to refloat the company with English capital of £5 000 000.



Tasmania Mine, Battery and Vanner House
Chlorination Works to the right
(*Australian Mining Standard* 1 July 1898)

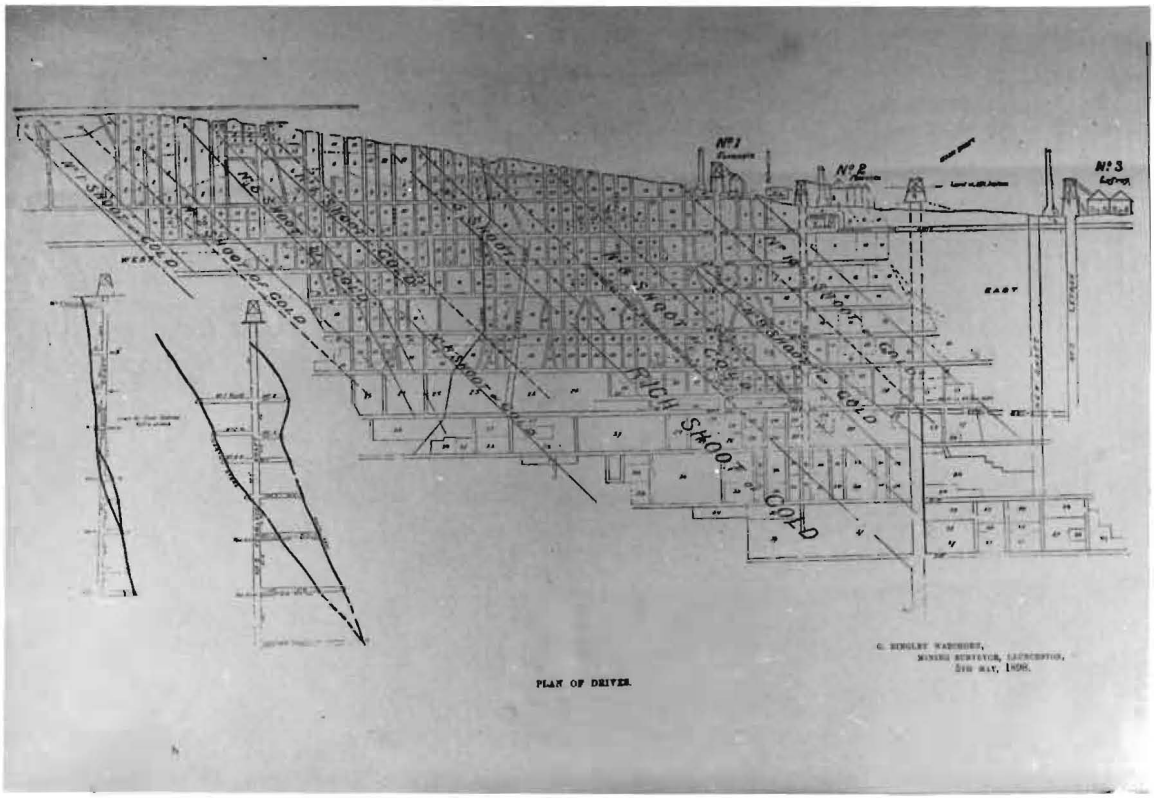


Battery at Florence Nightingale shaft
9 November 1890

To that time the company had crushed 495 895 tons of quartz yielding 569 7780z (16 147.633kg) of gold valued at £2 090 938. Dividends had amounted to £772 071/15/-.[46] In 1903, the Government Geologist, W. H. Twelvetrees, after examining the mine, concluded that it could only be worked to advantage if it was equipped with appliances capable of lifting six to eight million gallons (25-35 million litres) a day. Consequently the directors invited competitive designs from large manufacturers of plants and machinery in Europe, America and Australia. These were to be judged by 'the most eminent professional authority available in London'.[47]

In November 1905 the Governor, Sir Gerald Strickland visited Beaconsfield. At the Tasmanian Mine he saw over Hart's shaft 120ft (36m) high steel poppet-heads and 180ft (55m) steel chimney. After lunch, provided by Charles Crosby at Dowlin's Hotel, he visited the battery which had 105 head of stampers working, and the cyanide and chlorination plant. Blustering rain terminated his visit and he returned to Launceston on the *SS Miree*.[48] Sir Gerald congratulated the Company for obtaining English capital and directorship.

Six months later the company suffered a severe setback when high rainfall caused the deviation channel at Blythe's Creek to break its banks. The water poured into the old limestone quarries, settling over about 7 acres (2.8ha) of ground and cutting a 40ft (12m) channel. A dam was built immediately but was swept away within days. 'A deviation channel and two dams were then started. All carpenters were sent to work on the construction of fluming, the saw-milling plant being kept running day and night to supply the necessary planking. By the 7th of July 900 feet [275m] of planking 14 feet [4.3m] wide and 9 feet [2.7m] deep, was completed, and the whole of the water turned into it. The total amount of water which turned into quarries was estimated at 820 million gallons [3 728 million litres], and the amount of soil at 240 000 tons, a total of 5 million cubic yards [3.82 million m^3]. The flow during the heaviest part of the flood was estimated at from 250 to 350 million gallons [1 000 to 1 500 million litres] per day. The approach of water from the quarries was first felt in the mine twenty three hours after the overflow of the deviation channel bank, by large volumes of CO_2 gas being forced before it. On the 7th July the water rose to the 846 feet [256m] level, where it remained stationary for twenty -four hours. On 21st July it reached the 800 feet [244m] level. The highest point, viz., 796 feet 3ins [242.695m] below the collar of the main shaft, was reached on 30th July. The pumps and boiling tanks were raising about 5 700 000 gallons [26 million litres] a day, and by the 2nd of September the water was reduced to the 816 feet [249m] level. The eastern unit at Grubb's shaft then started, and a week later about 8 100 000 gallons [37 million litres] a day were being raised. On the 30th September the water was reduced to about the 970 feet [296m] level. The flood-gates at the 1 100 feet [305m] and 1 000 feet [335m] levels stood the heavy pressure very well, and enabled the pump in Grubb's



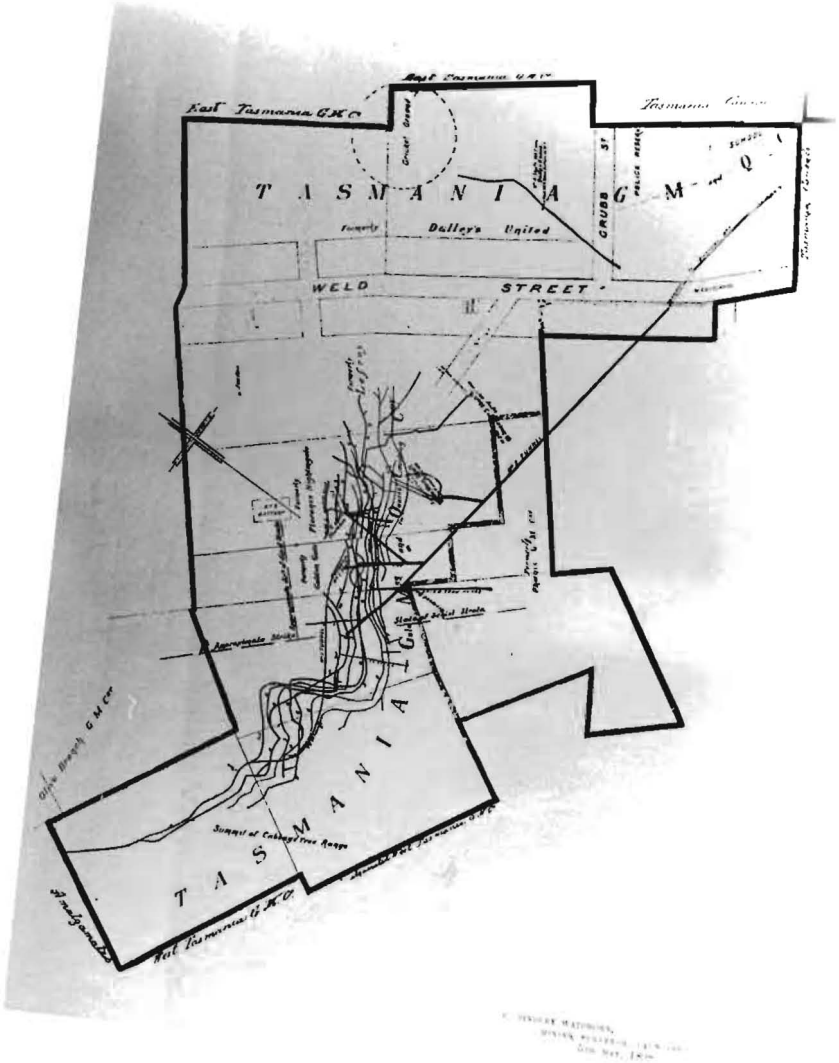
Tasmania Mine
(*Australian Mining Standard* 1 July 1898)

shaft to be put in. At the main shaft the lower set of poles were under water for eleven and a half weeks (that shaft being too near the lode for flood-gates to be of any use), and this caused much anxiety, as the failure of any of the valves would have placed too great a pressure on the flood-gates, and drowned the pump at Hart's shaft. The winding engine at Hart's shaft and the steel head-gear which were made of exceptional strength, in case they should ever be required to deal with a burst of water, saved the situation'.[49] Needless to say the gold yield was below expectation that year, and no dividends were paid.

In fact, 1905 was the last year investors received any return from the Tasmania Mine. The efficiency of the company was improved in 1909 by the replacement of the chlorination plant with a grinding plant and subsequent cyanide treatment, but it didn't make up for the continuing water problems. In June 1910 a burst of eight to nine million gallons (35-40 million litres) of water was cut at the 1 250 feet (373m) level and because of a breakage of a section of the pitwork of one of the pumps, the battery had to be closed down for two months.[50]

On October 12th 1912 a fire broke out at the North Lyell Mine and ninety eight men were trapped. Many Beaconsfield residents had husbands, sons and brothers at Lyell[51] and while the disaster was still in the headlines two men were killed, falling 900 feet (275m) from the cage in the Hart Shaft at the Tasmania Mine. The superintendent of the Tasmania Mine, Mr. Heathcote, refused access to the scene of the accident to W. J. Bennetts, president of the Beaconsfield branch of the Federated Miners Employees Union. This exacerbated a dispute which had been in progress for some time.[52] Hearing that a strike was imminent between two-and three hundred women met at the Alicia Hall to prevent it. Mr C. Cully, secretary of the FMEA, moved that the women be told the FMEA did not require instructions from the women on how to conduct their business, and although there was a great deal of opposition to it a vote to strike was carried.[53] The strike was averted on 25th November when all parties agreed to abide by an Arbitration Court decision.[54] This was handed down the following October, awarding the miners' a wage increase.[55] Alarmed by this decision the English board of management sent out Arthur Llewellyn, mining engineer, to report on the mine. He bore out the report written by the mining superintendant, Mr. C. F. Heathcote. The mine was working at a loss.

In February 1914, on the recommendation of Arthur Llewellyn, all development work was discontinued.[56] Llewellyn's thorough report was published in the *Examiner* of 10th March 1914. The amount of gold per ton of quartz was diminishing, the amount of energy to extract it was increasing and the cost of labour was about to rise by between 20% and 30%. From its inception in 1877 until August 1896, 371 408 ounces (10 529kg 689g) of gold was obtained from a crushing of 299 000 tons (304 000 tonnes) of ore, an average of 24.84 dwt. (1.417g) per ton. From September 1896 until June 1903, 198 850 tons (292 032 tonnes) were crushed yielding 152 813oz



Tasmania Mine
Australian Mining Standard 1 July 1898

15.37dwt (4339kg 816g 922mg) per ton. By now the chlorination plant was in operation and a further 46 622oz or 4 6dwt per ton were extracted this way. The total for this period, 199 435oz using both methods still only equalled an average of 20.05dwt (3 208mg) per ton. From 1903 to 1913 the average dropped from 16.4 grains (1093mg) to 10.3 grains (687mg). It was estimated that for each foot (30.5cm) the mine was sunk 21 million gallons (95 million litres) of water would have to be removed. The pumps were capable of draining 6½ million gallons (29 million litres) of water a day, so in order to sink the mine only 100 feet (30 meters) a year the pumps would have to be working without interruption.

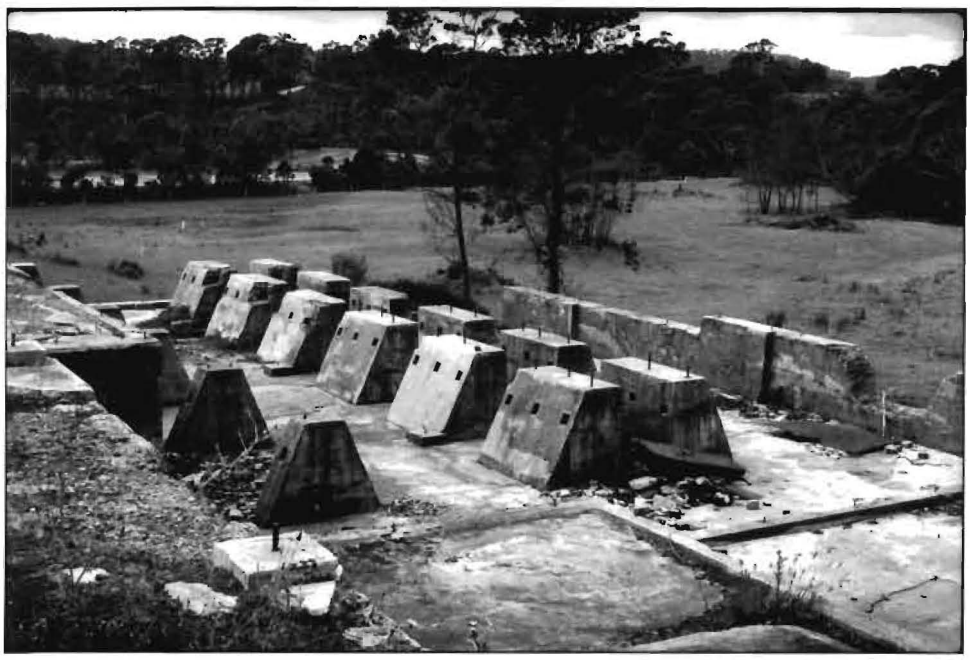
The Australian shareholders were unhappy about the decision and a number of them called a public meeting. They felt that the decision to close the mine had been taken in London without any reference to themselves, and they represented two thirds of the shareholders.[57] They requested that management be transferred to Launceston. Before this was considered orders came from London to remove some of the machinery, and it was at this point that the government intervened. An estimated 2 000 people were dependent on the mine and it was felt that their welfare was a government matter.[58] The Minister for Mines agreed to obtain expert advice on the viability of the mine; and at a heated meeting of shareholders it was decided that the closure of the mine was to be delayed until 16th May when the coal would run out.[59] The government's decision to rent the mine for £50 p.w. was made public three days after this dead-line.[60] The mine just managed to pay its way until October although the men were not receiving award wages, but in November the crosshead of the pump at the 500ft (150m) level in the Grubb shaft broke. Both floodgates at the 1500ft (450m) level were closed and the water rose. It was unanimously decided to remove immediately all rails, air pipes etc. from the 1370ft (418m) level. Those at the 1500ft (450m) level were already lost.[61] The mine was closed after a total yield of 836 556½oz (23 716 377g) at the end of the year.

Tasmania Mine

Tasmania Mine Reduction works

(8215 Tamar 55GDQ 861387)

Tasmania Mine. Details of Reduction Works



(8215 Tamar 55GDQ 861387)

Tasmania Mine Reduction Works
wheel support.
(8215 Tamar 55GDQ 861387)

Tasmania Mine

Grubb Shaft Engine House Hart Shaft

1905 1904

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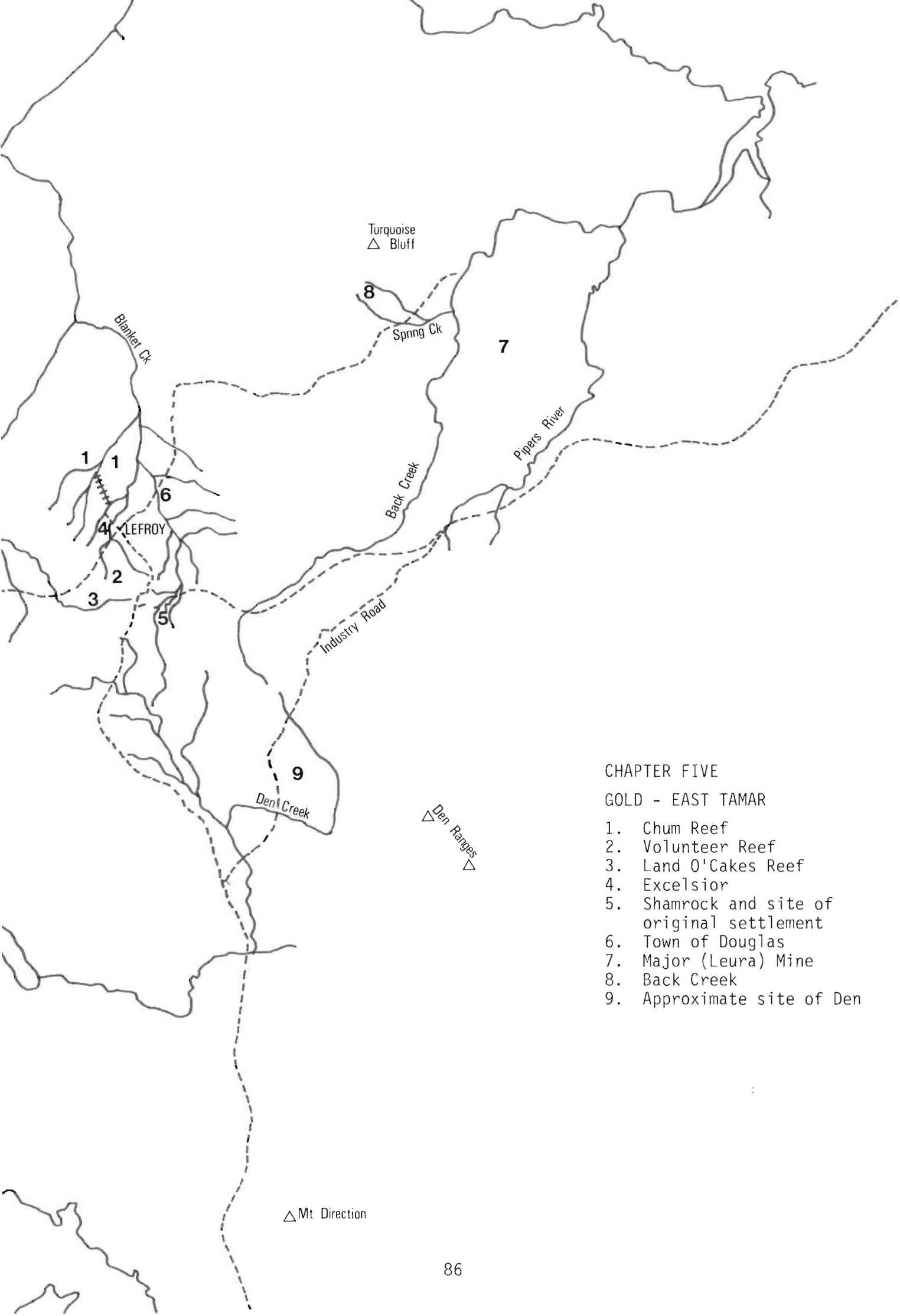


CHAPTER FIVE

GOLD - EAST TAMAR

1. Chum Reef
2. Volunteer Reef
3. Land O'Cakes Reef
4. Excelsior
5. Shamrock and site of original settlement
6. Town of Douglas
7. Major (Leura) Mine
8. Back Creek
9. Approximate site of Den

CHAPTER FIVE

GOLD - EAST TAMAR

Den

In the late 1860s a rush occurred at Devil's Den behind Mount Direction but only a few weeks later the place was deserted.[1] A year or two later, in February 1869, excitement was aroused again in spite of the fact that many people had burnt their fingers with previous rumours of gold. Three respectable gentlemen, Rev. Mr Fereday, Dr Richardson and Mr Lambert C.D.C. visited the Den Diggings. They saw a nugget the size of a walnut but were disappointed to find only ten miners on the field.[2] The population did, however, expand fast. There were daily reports of fully equipped and provisioned parties setting off to the Den.[3] Mr Hannibal Fenker discovered with a friend 60oz (170g) of gold in a fortnight while John Gaunt in one lucky dishful obtained a 1¼oz (35.437g) nugget.[4]

In December, a gold reef that was struck was so promising that the prospectors arranged to fully equip a party of miners to start work there in early January.[5] In February 1870 the Den Company's workings were reported to have reached a depth of 43½ feet (13.9m) with only 12½ feet (3.8m) to reach the reef.[6]

At a meeting of shareholders at the end of March it was stated that for three weeks ten men had been working double shifts. Stuart, the manager was directed to sink the shaft to 64 feet (19.5m) and then drive eastward at the 58 ft (17.7m) level. The plant was in good working order and stores, provisions and wages paid to the 14th of April.[7] A year later a five-head battery was formally started on the Industry claim, and the engine was christened 'Clara' by Mrs Trail.[8]

On 30th September 22oz (623.69g) of nuggetty gold was brought to the attention of the *Examiner*. Between twenty and twenty-five men were working on the Denison diggings, and were obtaining wages.[9] With the attraction of other gold fields which were emerging in the north east this relatively small one was soon after abandoned.

Nine Mile Springs

1869-1872

In late 1869 a small party led by Mr Richards, who believed Nine Mile Springs to be auriferous, erected a hut there and sank several shafts, two of them to a depth of 30ft (9m). The mine was soon yielding an average of 2 dwts (320mg) per dish. Richard's party managed to conceal the discovery until the claim was registered in Hobart. Although during their absence the claim was jumped by diggers from Waterhouse and Launceston.[10] The Nine Mile Springs fields were an attractive proposition, Waterhouse being very quiet at the time.

By May of the following year the population of Nine Mile Springs had grown to about two hundred. 'There are three licensed houses - T. Traile's, Barker and Douglas's and Karigan's - [These were Shamrock owned by Steele Traile, the Springs kept by Barker and the Victorian kept by Kerrigan[11]] three stores, two bakers, a butcher, a blacksmith. The buildings are substantial, and most of the business people are increasing or about to increase their premises, prospects justifying them. A post office is about being established at Barker and Douglas's store, and it is to be hoped a telegram station both here and at George Town, and also that some arrangement will be made to put on board the Victorian Steamer a mail bag from George Town or Low Head, so that several days' delay... will be avoided in transmitting or receiving letters.[12]

On May 21st an opening ceremony was held for the Specimen Hill Co. The machine was christened 'Day spring' by Miss Cox of George Town. It was shown to the *Examiner's* Special Reporter by the mining manager James T. Dowlin:

'The puddling-machine is substantially built into the floor of an excavation in the hill, and is worked by two horses attached to a beam extending on both sides from the lower end of the shaft. At the top of the shaft is a bevilled wheel working into another at right angles, communicating the necessary motion to a drum connected by means of belting with one of the Californian pumps... Besides the Californian pump worked by horsepower, there is another of exactly similar construction, designed to be worked by hand in the event of any temporary obstruction to the other, so that no delay need be incurred. Both are 25 feet [7m] in length, and so constructed as to be raised or depressed at the lower and according to the height of water in the dam. The sluice-boxes are eight in number, together forty-five feet [13m] in length, and contain seventy-six 1½ inch [37.5mm] augur-holes. They are so arranged that the water from the dam having been raised by the pump and flowed over the boxes, returns again along a wooden drain into the dam. The dam has been constructed by throwing a strong embankment

across the bed of a creek which flows close to and about 20 feet [6m] below the puddling machine... It is now just six weeks since Mr Dowlin went down to the springs, and he has certainly effected wonders. The whole of the machinery has been made on the spot within that time, all of it appears thoroughly substantial and suited to the purpose. Besides the machinery, extensive offices, stabling and a manager's residence have been erected'.[13]

The winter of 1870 was long, wet and disheartening but faith was shown by the Excelsior and Shamrock Companies, the first of which ordered a ten-head battery and the latter a fifteen head, both from the Union Foundry Ballarat. G. M. Newman consulting engineer to the Excelsior Company wrote:

'An excellent plant has been purchased, comprising a twenty horse-power engine and boiler, together with one ten-head battery, with all requisite appliances for crushing purposes. Messrs Leeley and Co. have completed the erection of engine frames and battery foundation, and are now engaged in erecting the machinery. I regret that considerable delay has been caused in the non-delivery of machinery by the barge *Tasman*, in consequence of adverse winds, and the breakage of an important iron frame lowering same in ship's hold. With the exception of the above frame every thing will be delivered on the mine during this week, and the works will be vigorously pushed forward. I anticipate that everything will be in readiness to commence with crushing within five weeks... There have been three shafts sunk to the depth of 50, 60 and 70 feet [15m, 18,-21m] respectively... A contract for raising one thousand tons of stone at 5s 3d per ton, has been let to Messrs Ward and party. There is about 160 tons of stone now raised of very good quality, and the contract is being satisfactorily carried out. Plans and specifications have been prepared and tenders invited for the erection of housing; and plans and specifications will be in readiness in a few days for erecting amalgamators...'[14] Newman was also the mining engineer for the Shamrock Co and had, as mentioned before, ordered machinery from the same manufactures. This included a 25 h.p. (18.65kW) Cornish boiler to drive a fifteen-head stamper, plus an amalgamating barrel and sundry gear expected daily on board the *Mercury*. Number 1. shaft had been sunk to 50 feet (15m) and a drive put along the course of the reef for a distance of 30 feet (9m) showing a well defined gold-bearing lode averaging 7 feet (2m) thick, including 2 feet (61cm) of payable casing. No 2 shaft had been sunk and timbered to 100 feet (30m) where a main drive was put in, cutting across a well defined reef 4 feet (1.2m) thick in which gold was seen. They came across a quantity of water which would necessitate the immediate erection of a horse whim to enable them to work the mine to a depth of 200 feet (60m).[15]

Transport from George Town to the Springs was difficult. The Shamrock boiler became stuck about half-way and the efforts of 32 bullocks were insufficient to move it.[16]

The Excelsior's battery was started up on 1st March 1871 with little ceremony but in the presence of some of the shareholders and directors.[17] The Shamrock received better attention four weeks later. 'Yesterday, at two o'clock the largest battery ever erected in Tasmania, and one upon which hang the hopes of a large section of the community, was formally started under very auspicious circumstances, the only draw-back to the entire success of the proceedings being the rain. From an early hour the bustling and thriving township of the 'Springs' was invaded by people from Launceston, from George Town, and from the surrounding country, attracted thither by the approaching event, and when the hour for starting the battery had arrived a large crowd filled and surrounded the spacious building in which it is erected. The proceedings may be said to have been semi-formal. Mr Newman, the mining-manager having briefly explained the ceremony about to be performed, handed to Miss Cox of George Town, a bottle of champagne suspended from overhead, which that lady gracefully swung against the huge fly-wheel, at the same time christening the engine 'Elvina' after one of the daughters of the Honourable W. D. Grubb Esquire the Chairman of the Company. Simultaneously with the smashing of the bottle, steam was put on, and the ponderous and noisy stampers commenced their work'.[18]

Apart from the fifteen head revolving stamping battery with its cast iron frames the plant consisted of a 16 inch (40cm) cylinder steam engine, and a Cornish flue-boiler, an 8 inch (20cm) surface pump etc. The battery had round heads with lose shoes and square necks slightly tapered, together with fifteen octagon shaped false bottoms, 10½ inches (26cm) in diameter and 4 inches (10cm) thick. 'The stamper shanks are of what is known as B.B.H. iron, and turned from end to end, each shank having a screw cut on, 22 inches [56cm] long and of three threads to the inch [25mm]. The discs attached to the bottom of the stampers are iron lock nut with half-inch [12.5mm] steel faces. There are three stamper-boxes with discharge openings, and gratings of 100 holes to the square inch [25mm^2]. The whole is supported by four massive cast-iron frames, planed and bored for the guides and wiper shaft, and four sole plate planed and fitted to the same. The steam-engine is a sixteen-inch [40cm] cylinder horizontal one, having three feet [91cm] stroke, with polished malleable iron crank, and crank shaft, and connecting rod; fly wheel twelve feet [3.6m] in diameter together with all the steam, feed, and exhaust pipes requisite to connect with the boiler. The boiler is, we believe, the largest in the colony... It was purchased second-hand, and is what is known as a Cornish flue boiler, 26 feet [7.9m] long and 6 feet 3 inches [1.9m] in diameter, and is filled with all the most modern improvements. It has been tested to bear a pressure of 75lb per square inch [516.75kPa]. The pump for raising water for the battery and boiler is an eight inch [20cm] surface lift, about 33 feet [10m] long, consisting of windbore, clack

piece, working barrel, two buckets, a clasp joint & c. The gear for working this pump consists of a cast-iron crank of 3, 4 and 5 feet [9$\bar{0}$, 12$\bar{0}$, 15$\bar{0}$cm] strokes, fitted onto the end of the cam shaft. The whole of this machinery was made at the Union Foundry (Messrs Walker and Co's), Ballarat under the personal supervision of Mr Newman, the experienced mining manager of the Company, and is spoken of by judges as a piece of skilful and efficient workmanship.

The claim is a very extensive one, and bears the appearance of having been thoroughly prospected. Where the stone is now being got out by means of a horse-whim and hand windlass is about two hundred yards [180m] from the battery, and after the stone has been roasted, it is wheeled along a wooden tramway, and emptied out immediately behind the feeding holes.[19]

In spite of the Shamrock's better start it was the Excelsior which proved more successful. In April 1872 a reef was struck at 230 feet [70m],[20] and great hopes were entertained but by November of that year the returns were so poor that it was decided to wind up the company.[21] The plant was sold to Mr ANicholas.[22] The Native Youth GMC, east of the Excelsior fared better. Its first crushing in September 1872 yielded 27oz 12dwt (767.35g) of gold out of 24 tons of quartz.[23] The Chinese continued with moderate success, bringing £40 worth in to Launceston in October 1872.[24]

1873-1875

The Gold Commissioner, Bernard Shaw reported in June 1873 'At the Nine Miles Springs, quartz crushing operations have ceased, but the alluvial miners principally at the Excelsior Flat, appear to be most successful. The population is limited, at the present date under one hundred - exclusive of women and children - of whom sixty-five are Chinese. It is difficult to ascertain the exact quantity of gold procured, as the owners - especially the Chinese - exhibit extreme reluctance to let it be known; but, judging by the circumstances of the men, I think I am not over-estimating their earnings since the beginning of this year at a total value of £5000. The value of gold found in alluvial deposit during the year 1872 was £8000. The whole of the men appear well satisfied with the result of their labour, and there is at this moment more legitimate mining than at any other period since the discovery of gold in the District. The gold is of the richest description, - superior I believe to any found in the other Colonies. There are innumerable gullies and flats in the neighbourhood of the Nine Mile-Springs presenting indications of an auriferous character which have not yet been tested, owing principally to the fact that when there was a large number of miners in search of claims in the District, the land was locked up under the leasing system then in force. I have not, since March 1871, when the present regulations

came into force, permitted a lease to be applied for.[25]

In December 1873 several large finds were made and a rush seemed imminent.[26] In February 1874, Alfred Nicholas who purchased the Excelsior Co's plant wrote to the *Examiner* after a cake of 528ozs (4kg 988g) was obtained from the crushing at the Excelsior battery of 50 tons quartz from the claim of Messrs Godwin, Sandberg and Hickson (Golden Point):

'Sir, - that there be no mistake or error as to the yield of gold from the reef of Messrs Godwin, Sandberg, and Hickson at Nine-Mile Springs, I beg to enclose to you the report of Mr Russell, the manager of the quartz crushing plant on the ground. The gold was taken from the tables in presence of all the parties concerned, and the amalgam was placed in the retort in the presence of Messrs White, Ritchie, Godwin, Sandberg, Hickson, and myself, and the gold never left my presence till placed in the bank. - Yours obediently...'[27]

The original owners of this claim sold it to a few gentlemen who floated the Golden Point Quartz Mining Co. Messrs W. W. White, A. Douglas, H. E. Lette, G. P. Hudson, W. Hart, W. Turner and T. C. Just were elected directors.[28] The Native Youth, also, was doing well with about 19 dwts (1440mg) to the ton.[29] These results encouraged a rush of miners.[30] The success of the Golden Crown, Hit or Miss, Golden Point and Native Youth' Gold Mining Companies warranted their general meetings being reported in full by the *Examiner*.[31] All crushings were done by the Golden Point on the old Excelsior Company's plant.[32]

As winter drew on the *Examiner* reporter wrote: 'Having paid a visit to the Nine Mile Springs, I found affairs of mining not so brisk as they were about two months ago. This is owing principally to the recent inclement weather which has interfered considerably with legitimate work, and caused water to be very troublesome in several of the mines. A great amount of "dead" work is at present also being proceeded with in the shape of sinking new shafts and deepening existing ones. General business, however, seems to be improving, as there are now several stores on the diggings, and Mr Ward has been compelled to make additions to his hotel, at the rear of which he is erecting a spacious assembly room. A feature in regards to new buildings is the erection of a "Joss House" by the Chinese, who for a desire for public worship have set a praise-worthy example to those professing a Christian faith as up to the present no effort has been made by the latter to provide for religious services'.[33] He also gave progress reports for the Good Hope, Native Youth, Morning Star, Hit or Miss, Golden Point, Golden Point Extended, Golden Crown, Johnson Party's Claims, Grand Junction, Bain and Richards, Specimen Hill, Industry and the battery which was now under the management of Mr Simpson.[34]

During September some of Launceston's chief mining speculators (including Peters, Barnard and Co) went into insolvency, throwing a feeling of gloom and suspicion on the goldfields.[35] W. W. White escaped from the colony wearing a disguise and wrapped in an oppossum rug.[36] It was rumoured that he had reached San Franciso.[37]

The Golden Point Quartz Company (now the owners of the Excelsior Battery) decided to discontinue operations and try to negotiate a sale of the battery with the Native Youth Company who also used it.[38] Instead it was put up for public auction by the deputy sheriff. The plant consisted of a ten-head battery, a 12 h.p. (9kW) engine, a boiler, circa 396lbs (179kg) of mercury, blacksmith's tools, miscellaneous collection of store articles etc, as well as the buildings which housed them.[39] The sale was badly timed. The New Native Industry machinery had already been ordered from Melboure and arrived on January 23rd just under a fortnight before the auction.[40] Mr F. W. Grubb purchased the whole of the Golden Point Q.M.C. machinery and buildings for £265.[41]

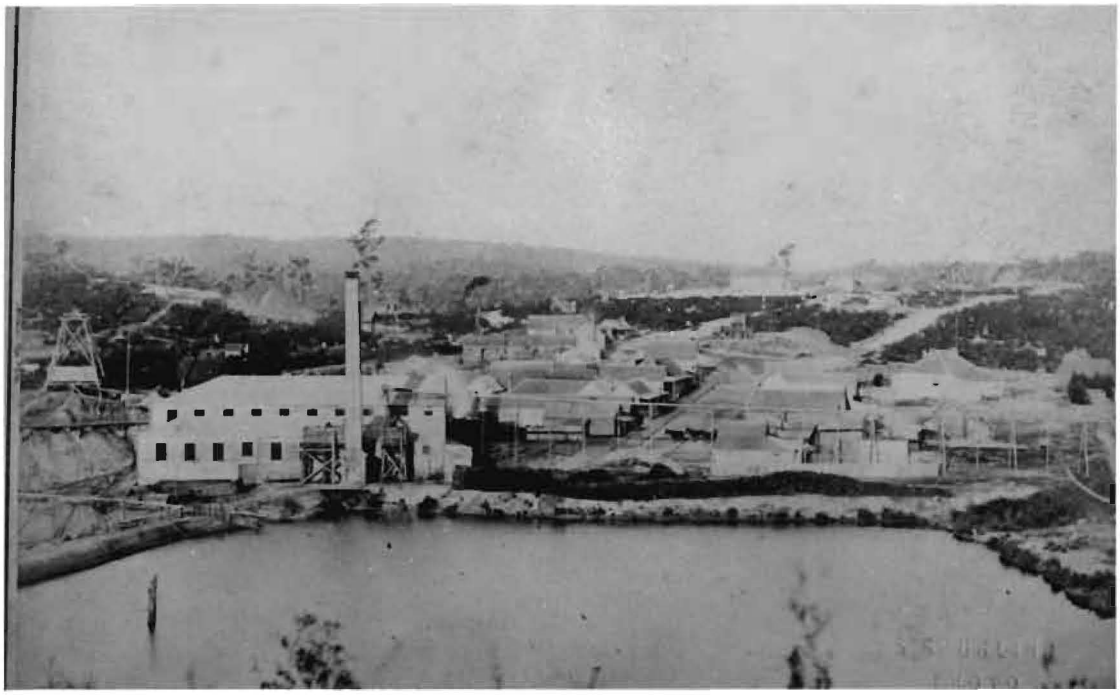
1875-1877

The New Native Youth remained promising although water was an everpresent problem. The Directors purchased pumping gear from representatives of the late Mersey Coal Company.[42] The Native Point and Native Youth amalgamated in February 1875.[43]

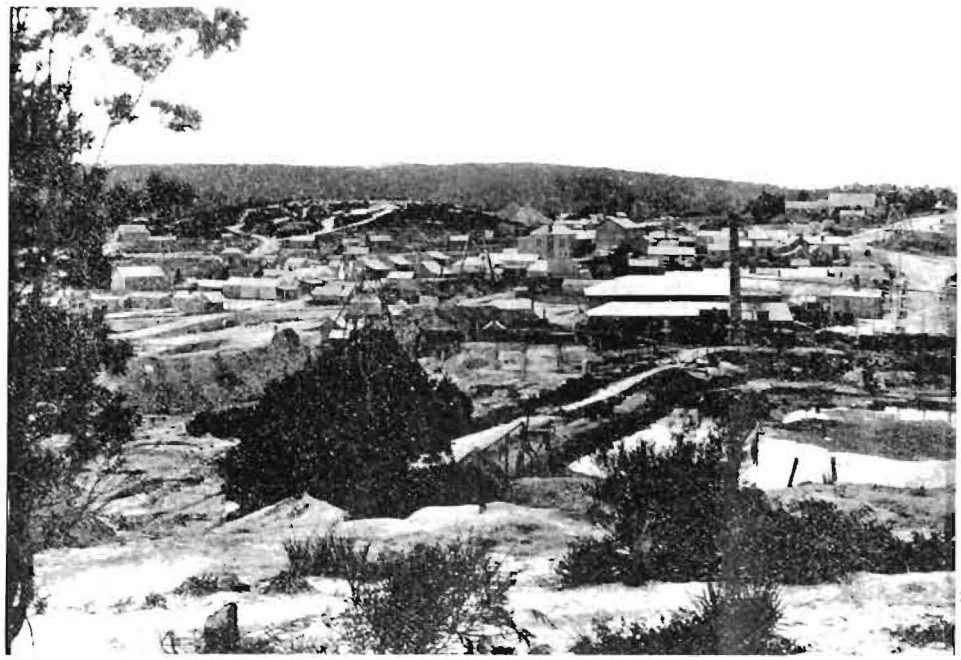
The reef on the Native Industry's claim failed and in June the directors were 'authorised to realise on the Company's machinery and all other assets, pay all debts, and wind up the Company in accordance with the 67th clause of the deed of association'.[44] By July the New Native Youth was the only one in operation.[45] By November this company had put down a new shaft 208 feet (63m) and put in a drive at 200 feet (61m). A reef was cut 38½ feet (11m) from the shaft.[46]

The New Native Youth *was* at this time the township, only three families were living at Nine Mile Springs proper. The Directors requested that the post office be moved to the works, and a school established for the education of thirty children living there.[47] This new settlement was named Lefroy in 1880.

Crushing results remained consistently good.[48] The City of Launceston Co. was formed to work an adjoining claim which had been abandoned by the Good Hope Company.[49] In April a cake of 798oz (22kg), the largest in Tasmania, was produced by the Native Youth Co; 514 tons (524 tonnes) of stone were crushed giving an amalgam of 649oz (18kg) from the plates and 1 700oz (48kg) from the boxes, making 2 349oz [66.4kg]. This when reported produced 792oz (22kg) of gold and 60oz (1.6kg) more was obtained from the silver. The value of this cake was given as £3 300.



Lefroy
Showing Volunteer Battery in foreground and dam
built by Carillo Sullivan (photo S. Spurling)



Lefroy
(*Australian Mining Standard* 1 July 1898)

There was now only one family at Nine Mile Springs proper where well-constructed police buildings, gold commissioner's quarters and a telegraph office still stood, but numbers of people arrived at the Excelsior. Claims which had lain dormant for some time were eagerly taken up again.[50] The City of Launceston Co bought the Native Industry Co's machinery and by June 1876 had timbered 100 feet (30m) of their shaft.[51] The Monkland Co. was formed to work S. Richards' old claim, 1½ miles [2,4km] east of the New Native Youth.[52] The New Native Youth continued to crush for other companies and increased its head of stampers to twenty.[53] Between its formation in November 1874, on the basis of the defunct Native Youth, and October 1876 it had yielded 8 813oz (249.4kg) retorted gold from (5 474 tonnes) of stone and most of this had been in 1876.[54]

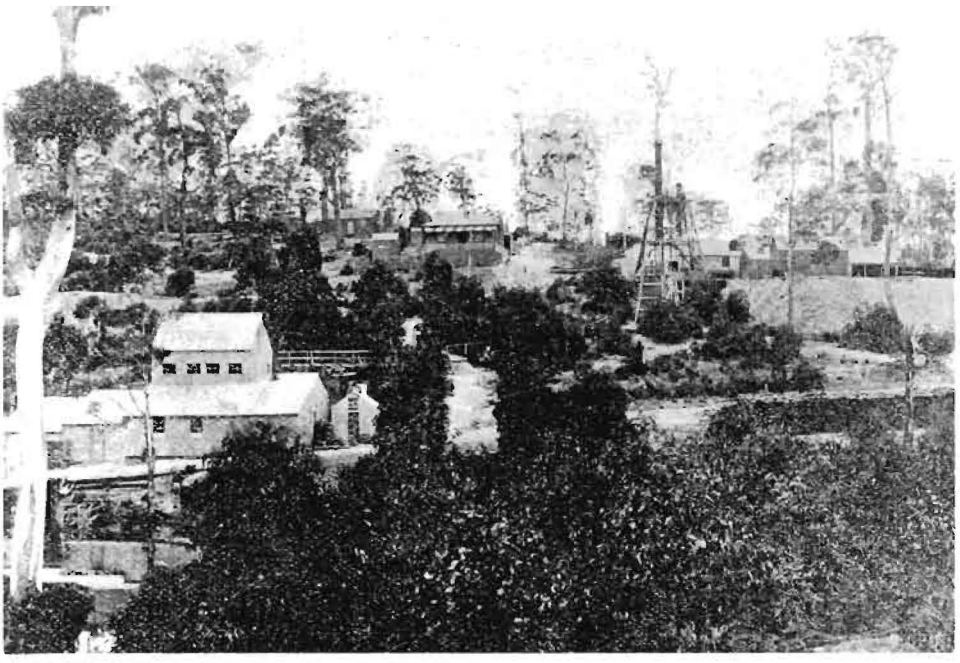
The same month the Company purchased another crushing plant from the Caledonian Co, Black Bay who had bought it from the Union Co. It was the first complete crushing plant ever erected in Tasmania and was made by Messrs Russel & Co of Sydney.[55] An *Examiner* reporter visiting the township wrote:

'Passing the deserted Springs Township presenting once such a busy scene, we reach the Excelsior, and find accommodation at Mr Cook's hotel where we were well treated and moderately charged, but from the business he appears to be doing, another wing added to the present premises would be warranted, and improve the accommodation for travellers. The population here is now some 350 souls in all, of whom some forty are Chinese, these latter having a joss house and gambling saloon of their own, both said to be well patronised, each in its way. The want of a school for the numerous children has been long felt, and the sides of a wooden building for that purpose on the hill above the township are already up, two men being still at work on it; but the subscriptions have not come forward as they should have done and this important work hangs in hand through the want of spirit in those interested'.[56]

The New Native Youth continued to lead the way. In December it was visited by W. Middleton, battery designer of the Castlemain Foundry, Victoria, who entered a contract to supply a 40 head battery within fourteen weeks. This would be driven by two engines and boilers bought from Mangana and Black Bay.[57]

While The Native Youth was waiting the East City of Launceston's manager reported in March 1877 on the progress of that company. 'The engine, fly-wheel and winding-gear are fixed, and will be bolted down complete by the end of the present week. The poppet legs are up; diagonal stays and the pieces that carry the brace are also in position. The masons started to build in the boiler last Wednesday...'[58]

Volunteer Gold Mine circa 1890
(photo S. Spurling)



Volunteer Gold Mine 1898
(*Australian Mining Standard* 1 July 1898)

The delay in delivery of the New Native Youth's battery was due to a fire which took hold of Middleton's premises and consumed amongst other things two houses of patterns. Nevertheless, progress was being made and it was said to be a splendid battery with stampers 1½ cwt (76kg) heavier than those in use, and the uprights or horses were made according to Middleton's new design. The castings were all done, the shafts turned and finished, and part of the battery ready to be fitted together.[59]

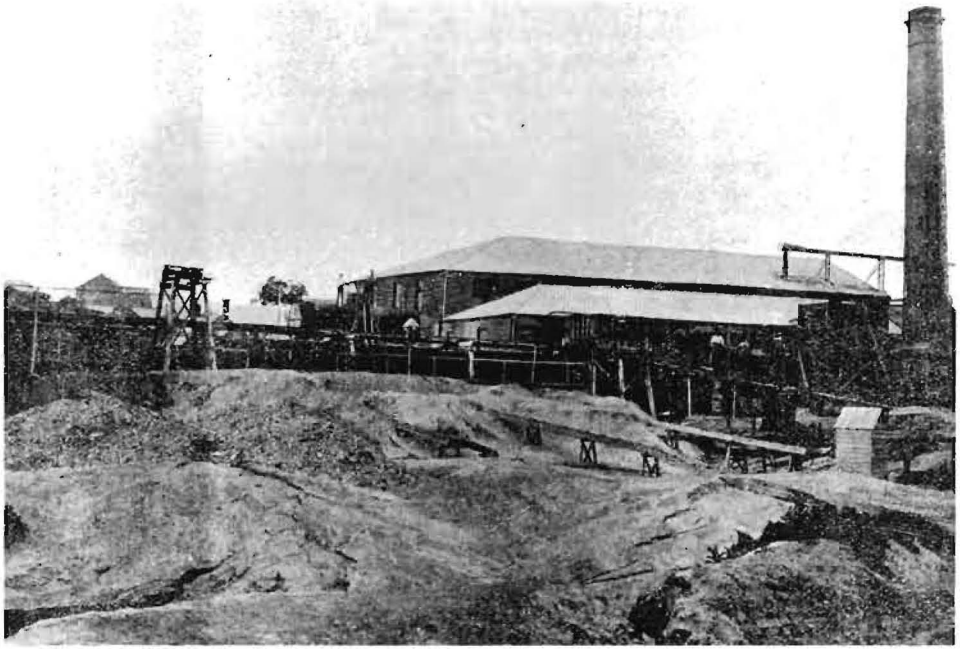
The New Morning Star was expecting the arrival from Victoria of a horizontal engine, 13 inch (33cm) cylinder, 3ft (91cm) stroke, and also a plunger pump, and all other appliances complete for pumping and winding on the claim.[60] In early April forty-four bullocks carted the New Native Youth's two boilers from George Town to Nine Mile Springs, and in June Launceston's Queen's Wharf was blocked with machinery for the New Native Youth and East Morning Star as well as the Denison's Sir William Denison.[61]

Buildings mushroomed; in April 1877 the young men of the district gave a ball to celebrate the opening of a new restaurant by Messrs Howes and Richardson.[62] By May there were no less than six 'first-class' shops, the newest being Messrs Tregurtha and Co's. Several buildings were in the course of erection, one of which was a Mr King's new restaurant, and three butcher's shops were now in operation.[63] A bigger and better joss house was opened in July with aplomb. Food was provided for all those who wished it and 'both morning and night nothing could be heard in little China Town, but the report of fireworks, and of bankers at the fantan shops, calling the winning numbers'.[64] An evening's entertainment was also provided to lessen the school debt. Welshmen from the slate quarries walked eight miles [13km], after a day's work, to sing, and having sung walked eight miles back again.[65]

1878-1881

By 1878 the New Native Youth was the only mine still showing a profit.[66] In April of that year George Aitken, the superintending engineer, showed a visitor the works connected with installation of the New Native Youth's battery. 'The new plant comprises a 40-head battery from Middleton's Foundry, Castlemain, and the foundation logs under each ten-head, or two batteries of 5-head each, are bedded upon concrete, on which stand piles 11ft (3.35m) long by 24 by 30 inches [60cm x 90cm] at the bottom, strongly bolted together. On the top of the piles are placed the stamper boxes, weighing about 2 tons 15cwt [2.8 tonnes] each, all substantially fixed and bolted down. The cast iron frames or "horses", of which there are twelve, for carrying the guides for the stamper rods and the shafting, are bolted down to a longitudinal and transverse sleeper of timber 18 by 24 inches [45 x 60cm], and the whole of the

Volunteer Cyanide Plant
(*Australian Mining Standard* 1 July 1898)



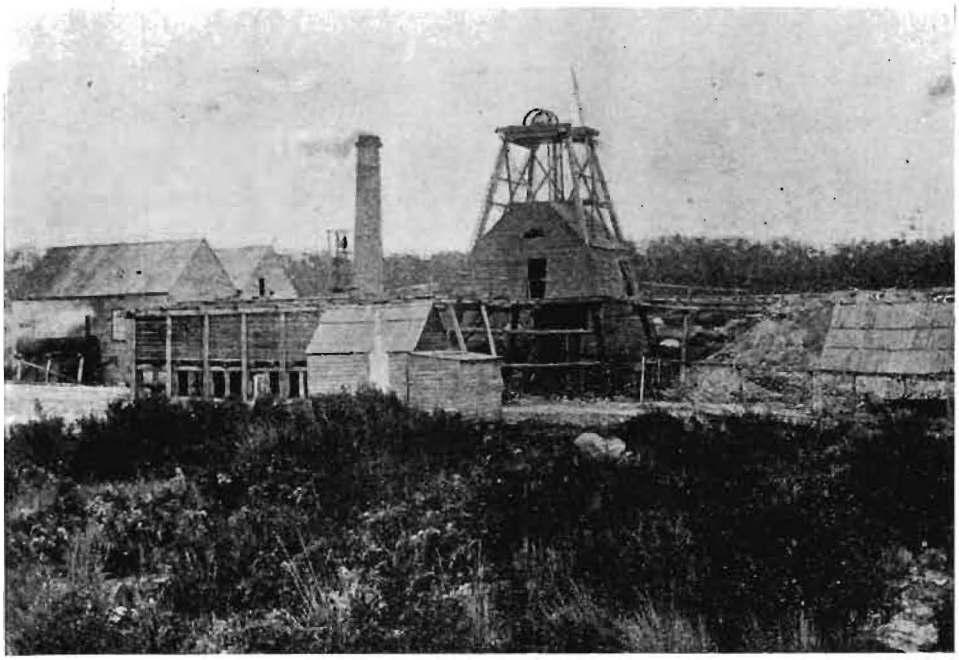
New Pinafore Battery and Cyanide Plant
(*Australian Mining Standard* 1 July 1898)

foundations are filled in with concrete to ensure stability. The cast iron guides in which the stamper rods play up and down are fitted in between the frames and the stampers are fitted with patent discs, heads, shoes, and cliff of the latest improved style. Each stamper weighs 8cwt [400kg], and the battery is capable of crushing 500 tons of quartz per week through gratings of 180 holes to the square inch [6.4cm²]. The cam shaft for each ten head (which comes between every two frames) is 5½ inches [14cm] diameter, with well finished cams or lifters of strong wrought iron. A counter shaft tapering from 7in to 6in [17.5-15cm] runs the full length, joined by couplings, and wheels and clutches are so arranged on it that each ten of stampers can be thrown out of gear when required, so that only ten, twenty or the full number of forty may be worked as required. All the wheels are covered with wrought iron shields so as to prevent accidents or the breakage of wheels. A platform with hand rails runs along each side of the stampers for the convenience of getting at the bearings of the machinery, and from the engine-house floor and platform the greater part of the machinery can be overlooked when in motion. There are two large plunger pumps made by Ruddoch, of Sandhurst, driven from the battery by wheels and a connecting rod to the bell crank. One, a 15 inch [38cm] water pump, supplies a tank 6ft by 7ft, by 14ft [1.8m x 2.1m x 4.2m] in the clear, holding over 3 500 gallons [160hl] from which the water required by the stampers is conveyed by pipes to the boxes. The other, a 16 inch [40cm] pump, is a Laidlaw patent trailings pump. After the trailings have passed through the boxes and over the ripple tables they pass into the trailings pit. Here the pump comes into play, and forces the water and tailings up a column 30 feet [9m] high, and they are then carried off through fluming made of Oregon pine supported on frames to a point 340 feet [103m] above the dam. By this means the water can drain back into the dam and be used over again. The whole of the machinery is driven by two 18 inch [45cm] cylinder horizontal engines, fitted with condenser, expansion gear, and a Benjamin's water heater.[67]

1882-1883

By 1882 the New Native Youth was described as having a 600ft (180m) shaft with levels at 200, 260, 320 and 450 ft (60m, 80m, 100m, 135m). Two 8½in (22cm) plingers worked the 320ft (100m) and 450ft (135m) levels, and a safety cage had been ordered.

The crushing plant was fairly extensive with three boilers; a pair of 18in (46cm) coupled engines, which drove the forty revolving stamp heads each of which weighed 900lb (400kg). Gratings went from 196-225 holes per square inch (6.45cm²). Outside the boxes copper-plates, ripples, blankets and tyes for the interception of the gold and the concentration of the valuable pyrites disseminated throughout the reefs. Apart from the engineer and the crushing manager all the other workers at the battery were boys. The surface



New Pinafore Mine

New Pinafore Mine
(*Australian Mining Standard* 1 July 1898)

buildings were, according to the Inspector of Mines, substantially constructed and the underground workings were secured with strong timber. Two managers, one above surface, and one below, two engine drivers, thirty-four miners and eight boys operated the mine. At least one of the miners was Chinese.[68]

By 1882 the Chum reef mine was expanding rapidly. A pumping engine was being erected and, to obviate the necessity of sending quartz a kilometre by tramway to the New Native Youth, tenders had been called for the construction of a quartz crushing plant. Sixty miners worked on the three levels (120, 180 & 240ft [36, 55, & 73m] opened up and fourteen remained on the surface.

Other Chums mushroomed. Adjacent to NewChum, West New Chum prospered. Here was installed a ten head stamper, winding and pumping machines and all the 'usual appliances for gold saving and the concentration of sulpherets'. This mine was open at four levels (112, 172, 236 & 270ft [34, 53, 72 & 82m]) and employed about fifty men in 1882. East New Chum was adjacent with a 240ft (73m) shaft. West New Chum Extended with a 184ft (57m) shaft, had suspended operations in 1882 pending the delivery of steam machinery. South West Chum had sunk a 200ft (56m) shaft. Great Extended West New Chum boasted two shafts: one 260ft (80m) opened at 250ft (76m); and a whim shaft being sunk from beneath the 140ft (43m) level. It was operated with a horse whim. United Chum was a promising enterprise in the process of erecting steam winding, pumping and crushing machinery, building a large reservoir, and excavating a 190ft (58m) long tunnel to the new machinery. The new main shaft was 10 x 3ft 6ins (3m x 1m) and 80ft (24m) deep with a whim shaft 226ft (69m). United Chum Extended were sinking to beneath the 118ft (36m) level and Consolidated Chum beneath the 140ft (43m) level.[69]

1886-1890

In 1886 the government offered a £ to £ grant to companies who were prepared to put money into deep sinking. West New Chum received £1 500 this way, using it to extend their main shaft by 145ft (44m) to 580ft (177m) and to drive 257ft (78.4m) on their 535ft (163m) level where they succeeded in finding a lode.[70]

The goldfield was described as being in a 'very languishing condition' in 1891, with only four mines operating. A. Montgomery, the Government Geological Surveyor noted the amount of gold that was being wasted because of the inadequacy of the tailings treatment machinery. He suggested the blanket tables be replaced with Frue vanners. Further refinement took place at Stubs' Pyrite Works which consisted of 'one long inclined handworked roasting furnace in which the tailings brought from the batteries [were] roasted, and a set of 12 berdans in which the ore [was] ground and amalgamated'. The two Chilean mills at the works were out of use because of their lesser efficiency.[71]

Lefroy's fortunes were in a constant state of fluctuation. In 1891 the discovery of a payable claim on the Pinafore reef brought renewed enthusiasm to the township[72] which 'attained a pitch of excitement unknown since its earliest and palmy days'. Within six months the Volunteer claim proved successful on the old Shamrock reef, and there followed numerous reopenings of mines abandoned through lack of capital.[73] During 1895 eight dormant mines were started up again and twenty-nine new mines were opened.[74] All in all about forty claims were being worked, some using impressive machinery and even electric lighting. £51 375 in dividends were paid out.[75]

By 1895 only twenty of these claims were still being worked[76] and by 1898 there were only eight, the Volunteer and New Pinafore being the only ones to show any signs of permanency.[77] The New Pinafore was granted £2 000 under the Deep Sinking Encouragement Act in 1900 and sank to 1 200ft (366m) without finding any payable stone.[78] The company suspended work on this claim and put its resources into the development of the neighbouring Golden Point and Golden Crown claims.[79] By 1904 the company decided to cease deep work having, since its formation, obtained 50 506oz (1 429kg 320g) of gold and returned £71 500 in dividends.[80] The Government again provided assistance on a £ to £ basis to prospect a deep lead which was known to run under the Lefroy township,[81] but the company met with little success and operations at Lefroy were gradually wound down.

Back Creek

The rush to Back Creek on the Pipers River began early in 1870.[82] A special reporter informed readers of the *Examiner* what was taking place:

'Yesterday I visited the alluvial diggings near Pipers' River. The spot which is just now the centre of attraction is about four miles [6.5m] to the west of the river, and about six miles [9.5m] from the sea. At present only a small area has been tested, but of its richness there can be no doubt; yet there is reason to believe that the surrounding country for a considerable extent is equally auriferous. The distance from this place is about sixteen miles [26km] along a very tolerable bush road - that is, tolerable now but there are several places that would be almost impassable in wet weather.

A far from disagreeable three hours' ride - in the course of which we crossed three very decent bridges, recently constructed by the Board of Works, namely, over the Nine-Mile Springs Creek and the Curry Rivulet - brought us onto the diggings, the first sight of which caused me no little amazement. Scattered about in various directions were fourteen or fifteen tents, about half that number being grouped together, with a police camp a few hundred yards higher up the gully. The population comprises about sixty souls. Two stores have been erected by Mr Tankard and Mr O'Grady, and at both excellent refreshments can be obtained, even to such delicacies as sardines and fresh preserved salmon. Horses can also obtain food. Both these stores have been transplanted from Waterhouse, and Mr Tankard's is an instance of enterprise and energy not often met with. Having heard a rumor of the discovery of gold at the Piper, Mr Tankard determined to visit the locality and see it himself. He accordingly left Waterhouse on Friday, reached the Piper that night, was satisfied with the prospect, returned immediately, and packed up a load of goods. On Monday morning at daylight he started again for the Piper, and by the next afternoon his tent was erected, and he was prepared to supply customers. Mr Tankard's store is conspicuous by a tall flagstaff in the front, but I would suggest to him the propriety of substituting the Union Jack or one of our own ensigns for the stars and stripes.

The country at the Piper very nearly resembles that at the Nine-Mile Springs, only that the hills are scarcely so high. Quartz and slate crop out here and there, and the surface is covered with broken quartz. A new track has been cut from George Town, much shorter than the old one, and at doubtful points Mr Chalu,

the Chief District Constable, caused finger-boards to be erected with directions pointed on them; but with one exception these have been removed. Knowing how common and convenient finger-posts are in the old country, where the difficulty of finding one's way is not a tenth of what it is here, I have wondered at the apathy of road trustees not providing these inexpensive yet useful guides.

At the Piper water is much wanted to enable the ground to be well tested, and at the time of my visit the principle operations were being carried on to secure a supply. Excellent water can be obtained by sinking on the flats, but the dirt from the hills has to be carried a considerable distance to be washed. At the upper part of the gully the excavations vary from two to five feet [60-150cm] deep; lower down, however, while that is the depth on the sides, the bottom dips in the direction of the gully, and in the centre a shaft has been sunk twenty feet [6m] without coming to the bottom, and still lower another (Dawson's) is already down forty-two feet [13m] also without bottoming. In both these shafts gold has been met with throughout, and this fact favours the belief that deep-sinking will be found necessary in many places at least, and that the gold will be found heavier, and in greater quantity. In the deeper of the two shafts mentioned, and quite at the bottom, highly sulphurous lignite has been met with, of which I have a specimen. The most extensive operations are being carried out by the Back Creek Alluvial Company under the superintendence of Mr Blackman [or Blachman], the manager. The land held by this company consists of five continuous claims, including the prospectors', which have been amalgamated, and altogether includes 74 acres [30ha]. They have 13 men at work erecting a puddling-machine and preparing water-courses. A large tank has been excavated for storing water, and at the time of my visit an extensive platform of logs had been constructed ready for the reception of the machine. All the timber was prepared, and Mr Blackman expected to have the machine completed by Saturday night, and allowing one or two additional days for alterations, and minor fixings that might be required, he hoped to commence work in good earnest by the middle of next week. The machine, with the labor of six men, will be capable of washing eighty loads a week which it is anticipated will yield from 12 to 20 ounces [340-570g] of gold. As the machine is being constructed at the base of the small hill from which the wash-dirt is obtained, very little labor will be required to transport the latter. From a hole close by the works Mr. Blackman took a small dish of stuff, and it was washed in my presence by Mr Dowlin. It yielded an excellent prospect - eight or nine grains [530-600mg] of gold, most of it being fine, but with three or four pieces as large as quail shot flattened. The gold is of the finest quality and slightly water worn. This specimen is in my possession. If the metal is uniformly diffused, which there is no reason to doubt, the prospects of the Company are first-rate.

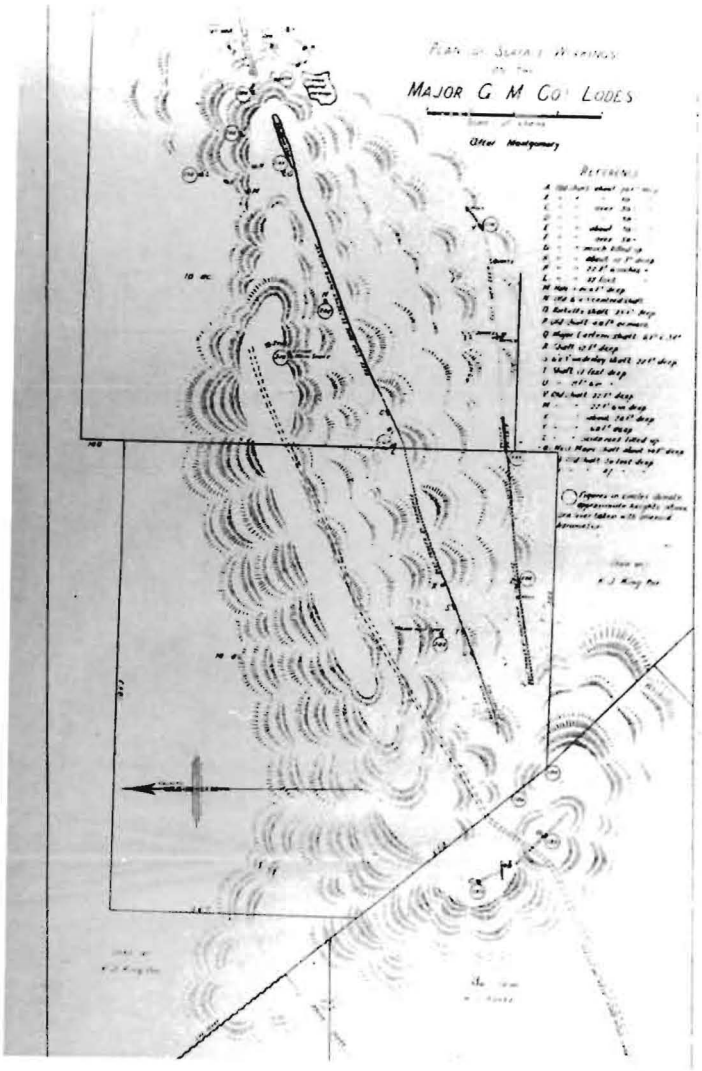
Nearly half a mile [800m] higher is the claim of Mr Kiernan and mate. They are working in the centre of the gully at a depth of two to three feet [60-90cm], with a bottom of slate, having an almost horizontal cleavage. The stuff consists of decomposed slate and quartz drift, with numerous quartz pebbles varying in size from a cocoa-nut to a quartern loaf. Gold is found throughout, but the heaviest is on the bottom. On this claim several loads have been thrown out ready for washing, and as rain is not likely to fall in any considerable quantity for the next two months, Mr Kiernan and his mate are sinking a tank a few hundred yards lower down to get a supply of water. From this claim, also, I saw a dishful of stuff washed, the result being, I believe, quite a pennyweight, but the dish was much larger than the one used at the first trial...'[83]

On Tuesday 24th March Mr William Ritchie a director of the Back Creek Gold Mining Co brought 30oz 15dwts 5grs (87g 849mg) of gold to Launceston, the result of the first regular puddling in the colony.

The machine had been put into operation the previous Saturday when several loads of clay and sand were put into the machine and puddled to fill up the cracks caused by the shrinkage of the green timber. At 2pm the machine was filled with three loads from the shaft and declared opened by Miss Rosa Chamberlain who broke a bottle of gin over the drum 'in lieu of the orthodox but unobtainable champage' and named it 'Rosa' after herself. Mr Blachman's (the designer or builder of the machine) health was drunk by the hundred or so visitors.[84]

Kiernan's claim and an adjoining one in New Zealand Gully were purchased for £1 650 by the 'Albion Company' early in March.[85] In June at the Back Creek Co. wooden tramways were being laid along the main drives, and wagons were being constructed by a Launceston firm. Once these were finished washdirt could be pushed along the tramways by boys, and horses could be dispensed with apart from three, which would be used in shifts of eight hours each to work the puddling machine.[86] In November the first Chinese miners began to appear. Twelve came to Back Creek, six to work on the Grand Junction and six on the Albion claim.[87] Those on the latter obtained 5oz (146g) of gold in their first week, working out at a very good average. So much so that the *Examiner* commented:

'It is to be presumed that the directors will now take steps to make some permanent arrangement with the Celestials for working the claim on tribute'.[88] The *Examiner* leader of 17 January 1871 wrote: 'The Chinese have already obtained a footing amongst us and judging by the present indications, it will not be long before they form a prominent part of our population. The complete success



Major Gold Mine
(*Department of Mines. Geological Survey Bulletin 42*)

of the Chinese diggers at Back Creek is certain to attract over many of their countrymen'. Two Chinese had already opened market gardens in Launceston, one had become a hawker and two more wished to start a fish curing establishment.[89]

In mid January they obtained fifteen ounces (425g) of gold from 96 loads and the following week five ounces (146g) from 58 loads of dirt.[90] In mid February Mr Segerberg who owned the Back Creek Co. lease, arranged for all the Chinamen from Mangana (nineteen had come over in November 1870), to work the Back Creek Co's ground. They were divided into four parties, one in the old workings where they were getting a machine of wash dirt out left by Mr Blachman, and had fifty loads ready. Another party was sinking prospecting holes. Another thirty Chinamen were expected on the *Tamar* from Sandhurst and they would be sinking for a deep lead.[91]

One of the parties was beginning to get unsatisfactory results by early May 1871 and moved to the Springs, where a second reef had just been discovered on the Shamrock claim.[92] In 1873 Bernard Shaw, gold commissioner wrote: 'At Back Creek, which was once the scene of active operations and of considerable excitement, there is now a population of ten only, eight of whom are Chinese'.[93] Nevertheless there was enough gold to keep a small number of miners employed but a correspondent in September 1874 wrote: 'The wet season which so lately set in has rather damped the energy of some of our superficial miners. The Back Creek, I am very sorry to find, is not likely to turn out so well in reefs as a short time ago I expected it would... I have been informed by a Chinaman that the reefs found by the Chinamen at Back Creek does [sic] not bear any gold'.[94]

Leura and Major Companies

The *Examiner* correspondent in January 1875 wrote: 'The time which has elapsed since my last communication has not changed the aspect of affairs in this extremely quiet neighbourhood much. On visiting the Leura to-day I was pleased to find the mineral prospect improving. I was shown some find specimens of gold-bearing quartz by Mr Sanberg, which looked very promising. Mr Sanberg also informed me that from among the stone which they are now raising from six to ten grains [400-670mg] to the dish could be got. From what I saw I will expect the first 400 tons of stone put through the battery to yield 40oz [1kg] of retorted gold. The machinery is fast approaching completion. The water-wheel is a splended piece of mechanism; it is swung so evenly that a gallon of water would set it going. From the advanced state of the works I must say that by the 1st of February we may expect to hear from the Leura Company's battery.[95]

Fifteen head of stampers were being prepared in March.[96] However, the gold yielded did not justify the battery and both it and the waterwheel were sold to the Mount Bischoff Tin Mining Co for £800. With the money made from this sale the directors, seeing the success of the Native Youth at Nine Mile Springs, suggested a 200ft (60m) shaft should be sunk. If a reef were stuck a trial crushing could be made at the Native Youth battery, and if the result was satisfactory a small battery could be erected on the site of the present one. The tramway, water race, battery house and other buildings were in fair order.[97]

Mr P. C. Rasmussen, mining manager for the Leura reported in October that he had cut the reef 12 feet (3.6m) from the shaft, and had one man preparing the tramway to the battery and two others laying the little tram from the hopper to the shaft.[98] After negotiations with the Mount Bischoff Co. the battery was re-erected on its former site and Mr Tredinnick from Ballarat was engaged as battery manager.[99] Crushing was started on November 7th.[100]

In spite of its £20 000 capital and the legal expertise of Henry Ritchie[101] the mine ceased operations in the early 1880s. It was not, apparently, the lack of gold. Rasmussen in his report to the shareholders of the Major P.A., the Company which took over the claim in the 1890s, stated that no stone from the 100 foot (35m) level was taken to the battery although he personally had seen gold in the solid quartz and obtained gold by hand-crushing.

In 1893 A. Montgomery reported: 'Within the last two years some very promising discoveries have been made on this reef to the west of the Leura workings. The shaft marked Q on plan yielded some good golden stone, 9 tons returning gold at the rate of 3 oz. 8 dwts [96.22g] to the ton. From here to the shaft R a little gold may be got where the reef is cut by trenches, but there does not appear to be much stone. In R the reef is 14 inches [36cm] wide, but rather poor, and underlays to the north. From this shaft to the next one, S, most of the ground has been stoped out, and a crushing of 2 tons gave 7 ounces [198g] to the ton. S is an underlay shaft, 22 feet [6.7m] deep, from the bottom of which the reef had been driven on 20 feet [6.1m] to the eastward and 28 feet [8.5m] to the westward at the time of my visit. In this level the quartz vein is small, averaging from 4 to 6 inches [10-15cm] in thickness; it is laminated and often much striated, the striations running almost horizontally instead of vertically, as is more usual. This is a very peculiar feature of this reef, both here and in the next shaft, T, where the reef is again sunk on to a depth of 12 feet [37cm], and is a little larger. In both shafts there was excellent gold-bearing quartz, the gold being both through the solid stone and in seams along the planes of lamination. Very good prospects could be got from the stuff extracted, and numerous very fine specimens had been picked out during the progress of the work. One dish of stuff from the heap gave me quite half an ounce of gold on washing, some of the pieces of metal being very coarse in size. Since my visit Mr. Barker informs me

that 2 tons of the stuff taken from shaft T, which is now rather deeper than when I saw it, yielded on crushing, 18 ozs. 15 dwts [530g] of gold, or at the rate of 9 ozs. 7½ dwts [265g] to the ton. The gold sells for 82s. 6d. to 83s. an ounce [28g] being therefore of very high quality. North of shaft T is a whip-shaft, 56 feet [17m] deep, from which a cross-cut has been made to the reef at the 50-feet level [15m]. Here the lode is larger, being from 2 feet to 2 feet 6 inches [60cm-75cm] thick at the eastern end. The amount of water met with, prevented much work being done, and the reef was followed for only some 30 feet [9m] or so. 30 tons of stone from it yielded gold at the rate of 19 dwts [28g] to the ton on crushing. The shaft being full of water I did not see the workings, but was informed that some very rich gold-bearing stone was still in sight when work stopped. To the west of shaft T is another shallow one, marked U on plan, in which the reef is again seen, still small, and westward of this it has been traced a considerable distance by trenches, with a little gold in it all along.

The south reef, where seen in the eastern section at shaft T, appears to be a big body of stone over two feet in width, showing laminated structure and striations like the quartz of the main reef, and also containing numerous crystal cavities. The shaft is said by Mr. Rasmussen to be 60 feet [18m] deep, and he states that the stone "all carries gold more or less, but not any of it was ever taken to the battery," from which we may infer that it was not at all rich. In the western section this reef has been traced a good distance by trenches and holes, in which some nice looking quartz occasionally showing gold, is to be seen. A prospecting dishful of the stuff from an old shaft (Z on plan), gave me a nice prospect of gold on washing.

In the adjoining West Major Company's section, 12-93G, we find a main shaft 50 feet [15m] deep, (a on plan), from which drives have been put in 50 feet [15m] to the south-east and 60 feet [18m] to the north-west without cutting the reef. To the north-west of this are an old 30 feet shaft [9m] b, now filled up, and another, c, 47 feet [14m] deep, from which a cross-cut has been put in to the south-east. At the end of this drive a reef of quartz 15 inches [38cm] thick was cut and driven on for about six feet [1.8m]: it contained gold, but not payable, and had an underlay to the south, that is in the opposite direction to the Major reef, which always underlays to the north. Since my visit I have been informed that the small space between the ends of the cross-cuts from shafts a and c has been cut through and the main reef found in it containing payable gold. The reef must bend to the northward from where it is last seen in the Major ground to get to this place, the cause of the deviation probably being a hard belt of blue slate in which shaft a is sunk. It seems likely that the north and south reefs of the Major have run together before getting to these workings.

According to the information given to me, 42 tons in all have been crushed from different portions of the Major workings for a yield of 85 ozs. 9 dwts. [2420g] of gold, or, say an average of 2 ounces [56g] to the ton. Though the reef is small at surface it seems to be widening out going downwards, and in the east end, in the Leura workings, it is a fair size. Very good stone has been got in shafts T, and S., and in shaft Q, while good quartz is reported from the West Major workings, shaft Z, on the south reef, and the whip-shaft, also from the old whip-shaft of the Leura, N. The gold in the alluvial workings at the east end makes it probable that there is another auriferous shoot in the reef in this direction also. Gold having been traced over such a distance along the strike of the reef there is every expectation that, when opened up extensively, numerous gold-bearing shoots will be found in it, and if these are nearly as good as the parts crushed by the Major Company the mine should have a very successful future. The reef as shown on the plan preserves a fairly straight well defined course, and cuts across the strata of the country, so there is a great likelihood of its proving a permanent fissure in depth. With the exception of some hardish blue slate seen in the old Leura tips and the hard belt existing in the West Major shaft the country is soft and "kindly" for the existence of the reef. Both north and south reefs deserve attention, and in my opinion there is very great hope that both will prove valuable mines. As there is a good deal of water to be overcome, as seen in the Leura main shaft and Major whip-shaft, it will be necessary to sink a new main engine shaft in order to work the lodes to advantage; the water raised from the mine will probably be all required for the battery'.[102]

Adjoining the Australasian Slate Quarry a claim was taken up by the Sir John Franklin Company which included the old Albion.[103] The Franklin Company was said in 1882 to hold a lease of 18 acres (7.3ha) and to have sunk several shafts between 67 feet (20m) and 200 feet (60m) in depth, but its small 7 h.p. (5.2kW) engine was incapable of controlling the influx of water.[104]

By 1893 when the mine was referred to as section 840-87G the workings from the engine shaft were inaccessable because of the water but the tunnel and eastern/shaft were still operable. A. Montgomery reported:

'The engine-shaft is said to have been 170 feet [52m] deep, and at that level a cross-cut was put in to the west-ward a distance of 50 feet [15m], from the ends of which drives were made north and south, each 15 feet [4.5m], the southern one connecting with a winze from another level at 100 feet [30m], which in turn was connected with the tunnel by a winze. Some gold-bearing leaders and bunches of quartz said to have been cut in the shaft between 90 feet [27m] and 130 feet [40m]. The positions of the tunnel and various shafts are shown on the plan of the field. The 60-feet [18m] shaft to the west of the mouth of the tunnel is said to have at the bottom a drive 12 feet [3.6m] to the south, which cuts a likely-looking lode-wall running east and west and underlying to the north, but with only a little rubble and flucan upon it. The 80-feet [24m] shaft north-west from this has in the bottom a leader of quartz, some 10 inches [25cm] thick, striking about N.80° E., which has been followed 30 feet [9m] east and the same distance to the west. It is said to have carried gold all the way, but to have become small when followed. About 15 tons of quartz are reported to have been raised and roughly crushed by hand, as much as 3½ ounces [100g] having been got from specimens. North-east from this shaft is one 35 feet [10m] deep, which cut a small vein carrying gold some ten feet from the surface. No

driving has been done on this. Between it and the engine-shaft a lode of quartz, ironstone, and slate is cut in a trench, which agrees in position and direction with a similar vein met with in the tunnel, and picked up again close to the 70-feet [21m], eastern shaft. No gold is known to have been got from this. The tunnel is 233 [71m] feet in length, and runs a little to the west of north. For the first 140 feet [43m] yellowish sandstone is passed through without noteworthy features, but the remainder of the distance is remarkable for the very large number of small parallel quartz veins which are cut through. These strike N. 45° to 50° E., and underlay to the north 1 in 5. Some short drives have been made along the course of some of the largest veins. The quartz is much ironstained; 10 tons of it from this level are said to have yielded gold at the rate of 6 dwts [8.5g] to the ton. The winze to the 100-ft [30m] level of the engine-shaft is about 55 feet [17m] deep, and is connected with it by a crooked drive. The winze from the 100-ft [30m] level to the 170-ft [52m] is some 30 or 40 feet [9-12m] nearer the engine-shaft than the bottom of the upper winze. Thirty tons of stuff from this lower winze are stated to have yielded 22 ounces [620g] of gold on crushing (equal to 14 dwt. 16 grs [20g] per ton). About 38 feet [11m] from the end of the tunnel the ironstone lode seen on surface is cut through, striking N.50°W, and dipping 70° to the N.E. It is from one to two feet thick, but is said not to have been met with at the lower level. It runs almost square across the group of small gold-bearing veins. The eastern shaft has two levels, one at 70 feet [21m] the other at 43 feet [12m] only the upper one being now accessible. In this we see a number of veins quite similar to those in the tunnel, running about N.60° E.; in 12 feet [3.6m] driven to the south-east no less than 13 of those little veins are cut through. The country is a soft clayey sandstone, much ironstained, and the quartz veins are also usually brown from oxide of iron.
A drive runs to the north-east 33 feet [10m] along a group of six small leaders, half an inch to three inches [12mm-76mm] thick, which have been stoped out above the level for about 15 feet [4.5m] in height, 30 tons of the mixed sandstone and quartz being reported to have yielded gold at the rate of 6 dwts [8.5g] to the ton.
At the end of the drive the ironstone lode is met with, running about S. 60° E., and underlaying 1 in 3 to the north-east; it is about two feet [61cm] in width, and consists of quartz, oxide of iron, and ironstained slate. It does not fault the little north-easterly veins, which continue on the other side of it without dislocation. A winze has been sunk on the iron-stone lode to the 70-feet [21m] level, and continued below it some 35 or 40 feet [10.7-12m] and at the lower level this lode has been driven upon 35 [10.7m] feet to the north-west and 40 feet [12m] to the south-east.

The run of gold-bearing veins seen in this shaft cannot be the same as is seen in the tunnel, but must be a nearly parallel set. In the stuff paddocked at the mouth of the shaft small prospects of loose gold can be obtained, and in bulk it is probably worth 5 to 6 dwts [7-8.5g] to the ton. If this return could be relied on to continue a payable mine might be opened up, but further prospecting must be done before a reliable opinion can be formed. Both this set of veins and the one in the tunnel might be mined very cheaply, and if explored and laid open by drives so as to expose large quantities of auriferous material it might be worth while to erect a large battery for crushing. As in the case of the Union mine, the probability is that the bulk of the stuff is too poor to pay for crushing on a small scale, but might perhaps yield a profit if handled in large quantities: it is therefore necessary to find out if the mine can supply the amount of material required to keep a large battery steadily at work. At the same time it would be advisable to sink a deep shaft to try if the veins come together in depth: should they do so there seems to be a good chance of a payable lode being found'.[105]

E. Broadhurst in 1935 was less optimistic. It was his opinion that the possibility of economical mining was remote because the gold appeared in a series of narrow veins rather than a single reef.[106]

The Union Mine, floated in 1893, caused some interest as being the only mine apart from the Major operating in Back Creek. Montgomery visited it that year making the following observations:

'The workings of the Union Company are situated at the head of the gully in which the White Lead lies. The main shaft at the time of my visit was 88 feet deep, and levels had been opened at 80, 63, and 30 feet [24, 19 and 9m]. To the north east of the main shaft are three small ones, from which older workings were made: these communicate with an old north-easterly drive from the main shaft at the highest level. There is no regular lode in the mine, - the gold being found in a white sandstone traversed by numerous small quartz veins. At No. 1 and No. 2 levels this auriferous rock forms the hanging wall of a vein of quartz from 6 to 12 inches [15-30cm] wide, accompanied by from 18 inches to 2 feet [45-60cm] of broken wall-rock or "mullock:" this vein strikes about N.65° W. and dips to the S.W. After passing through it no gold is found. At the bottom level the same vein is again met with, but smaller, and towards the south-east end much broken into leaders: here, too, the gold is found mostly on the hanging wall of the quartz vein. At this level, however, a drive to the north east towards the old shaft got some gold almost under the old workings. The gold in these appears to have been in white sandstone, with fine quartz veins through it, lying on the hanging wall of a troup of small quartz veins striking to the north east. In the bottom level there are numerous small leaders running about east and west, as if the two sets of veins seen running towards one another in the top level were coming into one course down below. Throughout the mine there are sudden changes of country from white clayey sandstone to black soft slate and soft white slate; and these latter

beds, which appear often to lie in flattish layers, do not appear to carry gold like the more porous white sandstone. As will be seen later on, there is reason to believe that the strata of the country in this district have a north-westerly strike and a rather high angle of dip: and this makes it probable that these apparent beds of black and white slate and sandstone are not true members of the series of stratified rocks forming the general country rock, but are altered parts of one or more of these strata, differently acted upon by the solutions that have deposited the gold. The more permeable sandstone strata would ahave a better chance of being impregnated with gold than the less pervious slates. Be this as it may, we have in this mine an instance of the country rock in the vicinity of a quartz vein containing enough gold to be worth crushing. The width of the gold-bearing zone seems to vary in the different levels, - being about 10 feet [3m] wide in the No. 2, and over 15 feet [4.5m] in the top and bottom levels, but not by any means all of it is worth crushing; and in the present state of development of the mine, it is hard to say where to look for the best portions. From the old workings near the surface gold is reported to have been obtained by roughly crushing and cradling the auriferous sandstone: from No. 1 level a crushing is said to have yielded about 15 dwts [21g] to the ton. Samples taken by me from the bottom level gave very little gold, but small prospects were obtainable from the paddock of stuff that had been saved. According to *The Daily Telegraph* of March 4th, 1894, a crushing of 6 tons yielded 1 oz, 16 dwts [50g] of gold, or at the rate of 6 dwts. [8.5g] to the ton.

Since my visit a small battery of five stamps has been put on the mine, so that it will be possible to test it thoroughly. The auriferous sandstone is easily crushed, and the zone of rock containing gold seems pretty wide, so there seems some hope that a very low return may be made to pay, say 2½ to 3 dwts [3.4-4.2g] to the ton. It would of course be necessary to crush large quantities of stone in order to be able to make any profit out of rock of such low value, and at present it cannot be said that there is material in sight that would justify the erection of a large crushing-plant. Nevertheless, the formation is auriferous, and sufficiently promising to deserve continued prospecting, the small battery being used to ascertain the value of the rock coming to hand from time to time. There is a possibility of a more defined body of quartz being found at greater depth, and I should recommend sinking a fair-sized main shaft instead of the small prospecting one now used, to try for gold at lower levels'.[107]

In the *Secretary for Mines Report* of 1907, W. H. Wallace described the small scale activities in process but speculated more on the hopes of the future and the achievements of the past. He estimated that between 9000 and 10 000 oz of gold had been obtained from the Back Creek field.[108]

Shaft remains on the Chum Reef

(8215 Tamar 55GDQ 980510)

Volunteer
Dam and mullock heaps

(8215 Tamar GDQ986501)

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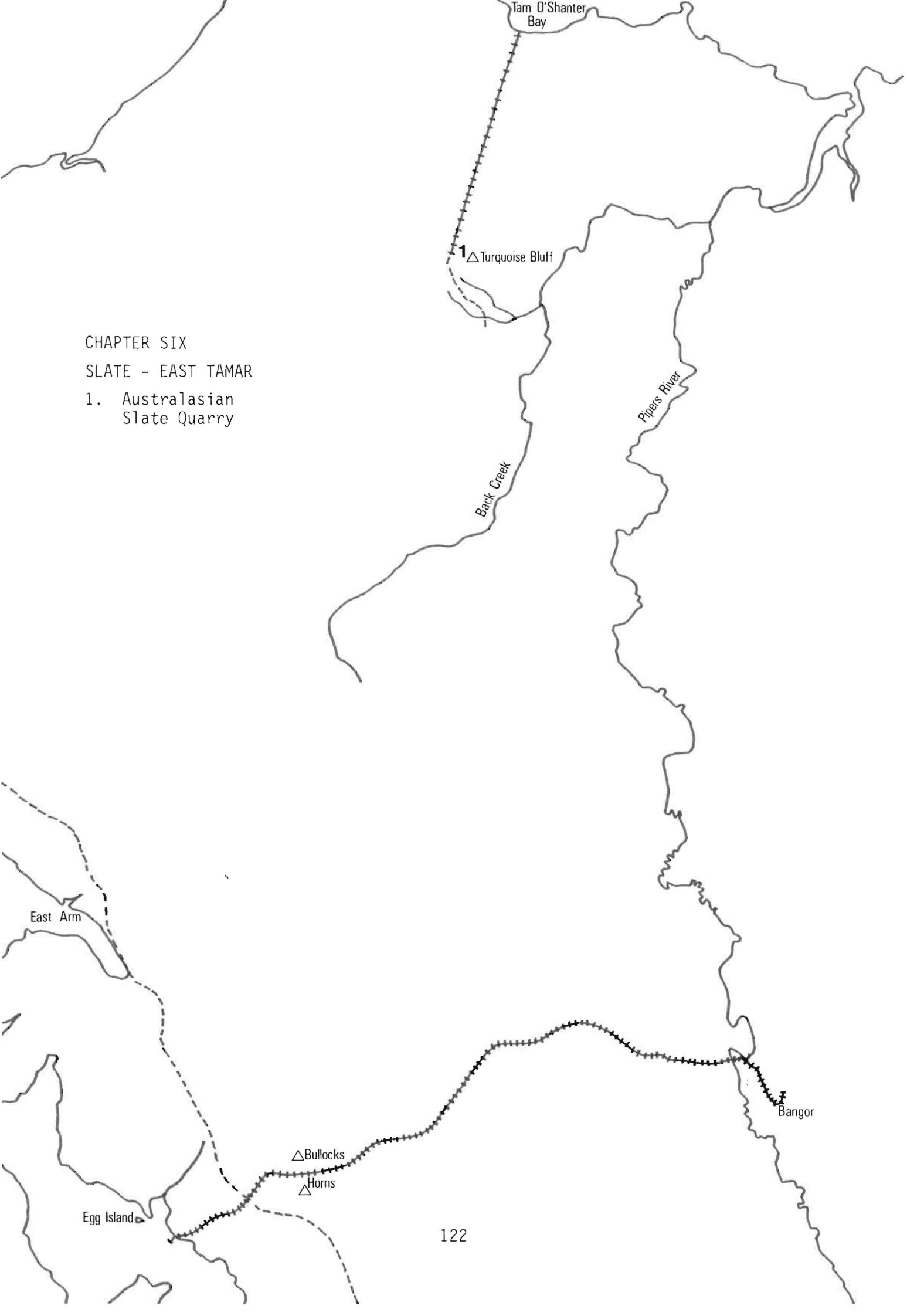

CHAPTER SIX

SLATE - EAST TAMAR

1. Australasian Slate Quarry

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SLATE - EAST TAMAR

In May 1872 Mr G Whitton was taking an interest in the slate found on Piper's River. He sent Mr Williams, a practical Welsh slate splitter to examine the quarry.[1] The slate was described as very hard, close and of a dark blue colour and by October five others were working the quarry as well.[2] The claim was referred to as Tyson and Whitton's[3] until it was floated as the Bangor Slate Quarry in early 1873. The prospectus circulated gave the following description:

Eighty acres, [32.4ha] of land at Pipers River, 15 miles [24km] from Launceston and 10 miles [16km] from Egg Island Creek, had been leased from the Crown for twenty-one years. The quarry had already been worked by the lease holders and the slate pronounced to be equal to the best Welsh. It was estimated that £4 500 would be needed to complete a tramway to the Tamar, to purchase rolling stock machinery and to erect the necessary buildings. However, the price of roofing and other slate was felt to offer a large margin of profit.[4] Only a fortnight later Alcock & Co of Melbourne were advertising in Launceston papers for offers of 5 000 slabs for billiard beds, and offering a 'liberal price'.[5] Slate sent to them by the Bangor Slate Quarry was pronounced equal to Welsh and a provisional order was placed.[6]

Harry Conway, the Launceston architect, wrote in July 1873:

'I have examined your property at the Piper River, and have much pleasure in reporting that I consider, after a careful examination, that it contains an inexhaustable deposit of slate, with unrivalled facilities for working the same. Where the deposit has been opened it shows a face of slate of fully 40 feet [12m] perpendicular height, the bottom still being slate rock, extending perpendicularly fully 50ft [15m] more to the flood level of the Piper River with probably unlimited depth below. The quarry shows a longitudinal face of several hundred yards. The blocks quarried out are of first rate quality, fit for any purposes for which slate is used in England or elsewhere, and the roofing slate I should not fail to recommend to be used on any building in the colonies, etc. etc.'[7]

The nominal capital of the company was set at £20 000 and a meeting was held on 5th September 1873 with Adye Douglas in the chair. Little business was undertaken apart from the election of directors. These were Messrs Marshall Cresswell, Adye Douglas, William Hart, William Turner and W. W. White (the largest shareholder).[8]

By November Bangor was a scene of considerable activity. Huts were erected and sleepers cut for the tramway. A lot of stripping had been undertaken, revealing an excellent body of slate. A Welshman, Mr Williams was supervising the quarrying while Marshall Cresswell, who apart from being a director, was also an excellent engineer and had charge of extensive railway works in India, was surveying the tramway.[9] The Bangor Slate Quarry Company's Pier and Tramway Act 33 Vict No. 3 was passed to enable the Company to take any land it required for the purpose. By January 1874 the wooden tramway was under construction with between 150 and 200 men at work, and splitters were being employed at the quarry. The roads were in a lamentable condition, which meant that the slate could not be taken to market until the tramway was built.[10]

In June when there were 19 men engaged at the quarry - 15 opening out and carting debris, two cutting and dressing slates and a blacksmith and his mate[11] - a visitor to the works looking down from the hill reported:

'For over a hundred feet [30m] into the hill side was quarried into terraces or levels on each of which men were hewing and hacking with picks and crowbars, drilling and boring into the solid rock, wedging off great lumps of slate in all directions, while others were wheeling away the refuse to the spoil bank, or carrying the best pieces to the splitters and dressers. Every now and then some one would call out "fire", and there would be a cessation of work while the men sought shelter. A few seconds shelter, and then a dull heavy report, followed by a shower of slate fragments, told that another blast was discharged, and the work began again. Lower down, near the foot of the hill, were men cutting the ends of slate slabs square with a circular saw, while others split them into thinner slabs and passed them onto the dresser, who sat with his rester and cutting knife, shaping the irregular shaped pieces into "Countesses", "Ladies", or "Doubles", so deftly and quietly that it seemed the easiest thing in the world if only one knew how. Close by were stacked close on a hundred thousand slates of very good quality, ready for delivery as soon as the tramway to Egg Island Creek on the Tamar is finished. This tramway is about ten miles [16km] in length, about four miles (6½km) of which are finished. The rails for this portion have been sawn by hand, but it is intended to commence the tramway at the river end as well shortly, and work back to meet the finished portion. Owing, however, to the great demand for timber just now, there is a difficulty in procuring the rails from any of the sawmills'.[12]

The gauge of the tramway was 2ft 6in (76cm) with sleepers laid a yard apart. The wooden rails, 5in (12½cm) by 3 ins (7½cm) were fixed into the sleepers with wood keys dovetailed.[13] The tramway was described in some detail by an *Examiner* reporter:

'The first forty chains [800m] of the line from the quarry run round the hill of the Company's property, and in consequence of this have been rather costly in construction, as cutting and blasting

have had to be done along the whole distance. The sharpest curve on the line also occurs in this section, being one of six chains [241m] radius; but Mr Creswell intends cutting away a good portion of the hill for ballast, which will enable him to pinch the line in, and thus reduce the curve considerably. All along this cutting slate has been exposed in an almost unbroken line. About a hundred yards [90m] from the cutting two waterways of 75 [23m] and 170ft [52m] respectively have been constructed. At this point also the Piper River is crossed by a substantial timber bridge of 45 feet [14m] span in the clear. Here too the trucks of the Company are being built. The line then for about three-quarters of a mile [1.2km] from the bridge runs through private property, and has not been expensive in construction, the earthworks being very light, but they increase in magnitude considerably in the next half mile [800m] as cuttings and embankments occur throughout the distance, some of the former running seven feet [2.1m] deep; three waterways have also been erected in this section. Surface running for the most part is then obtained for the next half mile [800m], but the line then runs to a large hill, to surmount which two cuttings have had to be made, one of which is three chains [120m] long and eight feet [2.4m] deep. The grade also at this point is rather steep being one foot in thirty [1:30]. With the exception of two or three small cuttings and embankments, nothing particular occurs for the next three miles [4.8m], the line running nearly the whole distance along the surface. At this point, however, in order to avert a 25ft [7.6m] cutting, a zig-zag has had to be formed. This is similar in shape to the letter Z, as the line runs back for about a hundred yards [90m] at an angle of nearly eighty degrees and then proceeds on again in a straight line. Very little engineering difficulty is again experienced until a short distance from the intersection of the line with the George Town Road which occurs at a place known as 'The Bullock's Horns', about a mile and a half [2.4km] below Coward's public-house. There a lengthy cutting 5 feet (1.5m) deep, has had to be made, and an 8 chains [320m] curve is also experienced. The grade too at this point is the steepest in the line being one foot in twenty [1:20]. From the George Town Road to the Tamar, a distance of about three miles [4.8km], the line, with the exception of a few chains runs on a descending grade the whole way. This section has been made the most expensive in construction on the whole line as the country traversed being very rugged and rocky considerable blasting had to be done... The jetty is situated a few chains to the south of Egg Island, and about twenty miles [32km] from Launceston. The works here are not in an advanced state, only the framework of about half the structure being erected. The jetty when completed will be thirty feet [9m] in length, and twelve feet [3.7m] wide, and will be what is known as pigstye and sill construction. Vessels drawing eight feet (2.4m) of water will be able to moor alongside as there will be fully that depth of water at low tide, and about seventeen [5m] at high water'.[14]

A shortage of local skilled labour convinced the directors to send their foreman to Victoria in search of likely men.[15] Machinery at this time was still all hand operated but at the first general meeting Creswell stressed the necessity of obtaining power tools to work the

slate economically. At the end of July they had stockpiled 77 000 tiles of top quality and 43 000 of second quality as well as a number of slabs suitable for mantlepieces, hearthstones etc.[16] By September the stock of slates had reach 200 000.[17] G. Barrett was given the contract to find horses and convey the slates down the tramway ready for shipment at Egg Island Creek.[18]

The quarry was honoured with a visit from his Excellency the Governor in October. At 12am he was met by the directors at the Mount Direction Hotel. The party walked to the 'Bullock's Head' where the tramway crossed the George Town Road. 'The Governor had thus an opportunity of seeing rather better than a mile of one of the most execrable roads in the colony, or rather one of its first-class bogs. It would have been dangerous to have driven the distance between the hotel and tram. At the intersection three tram trucks were waiting, each comfortably filled with chairs. The journey to the quarry took about two hours. Two and a half miles (4km) from the "Bullocks Head" was a descent which had been overcome by means of a zig-zag track.[19]

With the high expenditure on the tramway the company soon found itself in financial difficulties, but an emergency meeting was held at which it was decided to re-open the sharelist, giving preference to new share buyers.[20] The only momentary relief which could be seen was the interest shown by the Hobart Corporation, which indicated that it might purchase 130 000 slates to roof its market buildings.[21] Unfortunately they changed their minds and decided to use the considerably cheaper, but more short-term, shingles.[22]

An experimental shipment was sent to Melbourne and these received a favourable verdict. They were considered superior to those from Adelaide which were at the time selling at £15 per thousand. It was estimated that the cost of production and shipping would be approximately £6 10s.[23]

Messrs Just and Turner went to Melbourne to see whether they could interest investors in refloating the company as the Tasmanian Victorian Slate Quarry, also taking in the Tasmanian Slate Company.[24] Nothing came of this solution and at a special meeting on July 16th the directors were empowered to dispose of the company's assets.[25]

The property of the company was seized by W. Turner and offered for sale by auction by the deputy sheriff. This consisted of tramway, trucks, trolley, a variety of quarrymen's and black-smiths' implements, a quantity of slates, slabs etc, one vertical engine, a miscellaneous collection of store articles etc.[26] The tramway claim and plant were bought by Mr Campion on behalf of some of the shareholders for £1 070. Mr A Evans bought a steam engine (he was, at the time, expanding his soap works), and 50 acres (20.25ha) of land at Cox Hill were purchased by H. Turner.[27]

Ten months later the Bangor Slate Quarry was said to be in good hands,[28] but it was not heard of again until Messrs David Blair and William Arkenhead obtained a 21 year lease for the property from the crown in April 1880. The tramway was described as being in a very dilapidated condition but it was repaired by the new leaseholders who also erected buildings for machinery, houses for miners, engines, winding gear, machinery for dressing and splitting slate.[29]

In February 1885 Messrs Clark and Blair, wrote to the Board of Imigration requesting that they organise the importation of 120 men for the quarry. 'Mr Blair will visit you, and if you will kindly allow it, will deposit with you a sum of money to cover all the expenses of your writing to your agents to arrange the passage. We think this would be better for the emigrants, and as you have all the appliances at home for sending out emigrants it would facilitate us very much. There is also another way by which all the expenses to the Government and to ourselves might be obviated as each emigrant is entitled to so much land we might agree with him to take the land and work his passage money out on the works, the Government giving us a lien upon such a grant until we were recouped'.[30] A cheque for £2 100 was made out by Mr Blair to cover Government expenses.[31]

The only reference made by the *Examiner* to the arrival of the Welshmen was when Thomas Jones, quarryman was charged with being of unsound mind after running through the bush naked, brandishing an axe. His insanity was said to have been excused by sunstroke on his voyage out from Wales.[32]

Meanwhile Blair was arranging the erection of fifty cottages.[33] A shaft was down 180 feet (54m) from this a number of drives had been put in at various levels. Chambers in the drives measured from 60ft (18m) wide and 30 feet (9m) high upwards. Forty or fifty miners were already employed.[34]

There existed between the new settlement of Bangor and the older mainly Irish settlement of Turner's Marsh, considerable tension. John Robertson, the quarry manager, made no secret of his disrepect for the Irish, and refused to let Turners' Marsh settlers on to Bangor land to sell their goods. Vitriolic correspondence in the papers ensued as did the blocking of the Bangor tramway with several two ton piles.[35] The lack of welcome to the quarry prevented very much news reaching Launceston. The occasional concert given by the Bangor Minstrel troupe was written up but even an event such as this was somewhat marred by rotten egs.[36]

Robertson was cautious at his slate works. All hands were employed in opening out-chambers etc so that after preparations were completed the quarry there could be a continuous output for up to twenty years. It would be four or five years before all the deadwork was done. In July 1885 they expected to have all their new machines installed, and the full complement of Welsh workmen, within a few months. 'Until then the proprietors are not desirous that strangers should visit the works, as that has resulted in annoyance of the management and interference with the workmen... Ships of considerable tonnage have been loaded, but a new jetty is now under construction which will provide deep water berths at which any one of the ocean-going vessels that visit the colony may take in cargo. At the present time there are about 100 men on the works, who are divided into

three shifts, so that from Monday morning to Saturday night the work is continuous. There are eighty or more Welshmen on the passage, and it is supposed the full working strength will be about 200. At the main shaft there is powerful steam winding and pumping gear, and by means of these main lifts the blocks of slate, as soon as dislodged from their beds below, find their way to the surface; a tunnel having an incline of 1 in 2, or 45 degrees, is being made by men working both ends.

It is anticipated that these gangs will meet in a couple of months, when a way will be opened out, by means of which the refuge will be hailed up and shot out of the way without any interference with the workable slate. The blocks of slate having been landed on the bank, are at once run away on a tram to one of the saw benches, where they are roughly squared by rapidly revolving circular saws. To these there is necessarily great wear and tear, and for the purpose of sharpening them there are three steam sharpening machines, one of which deserves especial notice as being entirely automatic. The saw having been once placed, every tooth is treated in turn with utmost precision, and without any further oversight being needed. From the saw bench the blocks are handed over to the splitters, who deftly drive their chisels in, having due regard to the proper line of cleavage, splitting each block, perhaps, into three, each of these again divided, and even yet again divided, after which the only remaining process is to properly square the seats and trim or dress the edges which is done by a machine, not unlike a chaffcutter in appearance, the action of which in the slate, resembles that of a pair of scissors, cutting the slate with as little jar and breakage as it is possible to imagine. This machine is fitted with certain gauge stops, adapted for all sizes of slates that are made, and from it they go to their several stacks, where they are so exactly true to size that the most careful investigation cannot discover a difference.

It will be understood from the foregoing, that there is a very large item of waste or refuse in this manufacture, and that, consequently, the saving of labour in the handling of this is a very great consideration. The appliances for the purpose of disposing of it begin at the sloping tunnel already referred to, and are found throughout. At the sawbenches the sawdust is carried away in a pipe by a tiny stream of water; the trimmings from all the machines fall at once into trollies travelling on rails in a sub-way, and are taken to the shoot, and so got rid of. The ingenuity displayed in these matters, in disposal of the powder magazines, etc., and in the arrangement of the whole of the ground, reflect great credit on Mr J D Robertson, the manager, who seems to be ubiquitous, who does not confine himslef by any means to the eight hours' shift, and whose whole energy and life is devoted to making a grand commercial success out of this venture, and to his labours early and late will be greatly due the time which is not far off when the Bangor Quarry will be one of Tasmania's best-paying undertakings. I should remark

on the exceedingly comfortable little three-roomed cottages that are provided for the families, the boarding-houses for the single men, the supply of good water by pipe to all, the school and the English church services, the store and the post office, all of which the management has taken care should be supplied, that the people in the employ should not be without the necessaries and comforts of life. I think that close enquiry would have revealed a large amount of educated thought and native talent in the quiet men we met when off their shifts - English, Scotch, Irish, and Welsh, with a good sprinkling of colonial-born men, and among them there is many an ardent politician well up in the questions of federation and reciprocity, and the working of the land laws. There is some musical talent for I heard the mellow tones of an euphonium dwelling on "Home Sweet Home" by moonlight, and am pretty certain that a piano sounded out from one of the cottages'.[37]

The first sign in the papers that pointed to a downturn in activity at the quarry was a letter from "an Admirer of Music". 'Sir, -' he wrote, 'I learn that about 45 employers have been thrown out of employment on the 8th inst. at the Bangor Slate Quarry, owing to the depression of trade, mostly young men, including the majority of the renowned Welsh choir, "The Cambrian Glee Club", who have been it is reported, practising with their songs and choruses with the intention of having a concert in Launceston.

It is possible that this deplorable event will cause the choir to be dissolved, owing to the necessity of its numbers scattering over the colony in search for employment. If that will be the case it will disappoint many an admirer of music who has looked forward to the pleasure of hearing the Welsh choir once more.

I desire to ask, through the medium of your popular paper, what is the intention of the choir as to the future, whether they intend to have a final concert or not. If they will have one, I can assure them of the patronage of all the music lovers of Launceston if not the surrounding country'.[38] The admirer of music was not to be disappointed. The choir gave a performance at the Mechanics Institute on Boxing Day.[39]

Iron roofing became increasingly popular as a cheaper alternative to slate and the quarry became uneconomical.[40] On March 2nd 1888 Messrs W. T. Bell & Co were instructed by Messrs David Blair and Joseph Clarke to sell by auction the whole of the machinery and plant of the Bangor Slate Quarries. This proved to be extensive - five steam engines, 6-16 h.p. (4.5-12kW) two 6-8 h.p.(4.5-6kW) Tangye pumps, three new sharpening machines, crab winches, patent air blowers and hand punching machines, one 30 h.p. (22kW) tubular boiler (wood or coal) with iron chimney stack, one 20 h.p. (15kW) ditto, eight slate saw benches (iron), thirteen slate dressing machines (iron), one slate planing machine (iron), one American emery grinding machine, fifteen ½-¼ ton debris trucks, four slate quarries, two sets of cages and pulleys, five wooden slate saw

benches, 100ft (30m) iron pumping rods, 80 feet (24m) 2½inch (6.3cm) shafting with 3 (90cm) and 5 feet (1.5m) pulleys, plumber blocks and belting, sixty feet (18m) of 3in (7½cm) shafting etc, twelve tons 12-14lb (5-6kg) iron tram rails, two iron turntables seven thousand feet (2 134m) 3-1in (2.5 - 7.5cm) steam piping with couplings, 4 tons scrap iron, 5cwt (250kg) 3/4 - 7/8 octagon steel, thirteen 400 gallon (18 001) iron malt tanks fitted with taps, small anvil and bellows with air fan, 3 by six (1 x 2m) bellows with anvil and air fan, office 10 x 10ft (3x3m) with iron safe etc, tramway trucks 2ft 6in (76cm) gauge, 18in (46cm) to 2ft (61cm) wheels, three tip trucks, engine shed 72ft (22m) by 54 (16.5m) with ironically, a galvanised iron roof, boarding house 60ft (18m) by 40ft (12m) with bedrooms etc., galvanised iron cook house 15ft (4.6m) by 12ft (3.7m) with iron range coppers etc., 9 cottages each with three to four rooms. Fifteen cottages slate roofed each with three rooms, twenty-five iron roofed three to four room cottages, one four-room cottage occupied as police station; schoolhouse 30ft x 18ft (9m x 5.4m) with ante room, butcher's shop and gear, 1¼ acres (0.5ha) freehold land with three-room cottage next to tram bridge, Piper River, Bangor Club with three acres (1.2ha) leased from Government, full sized billiard table, by Alcock, and fittings, piano, whole of furniture of Bangor Club, Manager's house with outbuildings etc, about 20 000 bricks and lot old building material, 10 acres (4ha) opposite Egg Island with two room cottage, and sheds - jetty, tram rails, two room hut at 5 mile farm used by repairers, 30 bags lime at jetty, stores groceries etc.[41]

In 1918, at a time when there existed a shortage of building materials including galvanised iron because of the Great War, the Government Geologist W. H. Twelvetrees wrote a descriptive report on the Bangor area, to explore the possibility of re-working the quarry.[42] No-one seems to have taken up the suggestion.

In 1969 Mr F. Schepplin took up the lease which is now held by the Tasmanian Slate Company.[43]

The Bangor Slate Quarry was not the only one in the region. A special reporter in July 1873 made reference to the Piper River Slate Quarry which, he said, was, held by a small proprietory and located on 240 acres (97ha) of land near Mr Barrett's homestead. It had within the last week yielded 'the finest specimens of slab or slate ever found in the world'. The colour and texture resembled closely the slate from Bangor, Wales, and they were met with enthusiasm by the Welsh quarrymen. A tramway was planned to run through the East Arm Flats, from the quarry ten miles (16km) to the confluence of the River Tamar and Egg Island Creek.[44] This quarry adjoined the Bangor and a magnificent body of slate was exposed. Unfortunately it was soon found that the majority of the good slate was below the water level and that pumping machinery would be required to drain it. Work was suspended.[45]

The Tasmanian Slate Quarry was held by two proprietors two miles down river from Bangor. It was on a 40 acre (162ha) lease on a seemingly solid slate 400ft (122m) hill on the western bank of the river. William Thomas an experienced Welsh quarryman supervised

nine men who had broken into the hill ten feet (3m) above water level and opened a face about 150 feet (46m) long. A bridge had been built across the river and the mullock was transported by tramway to the opposite bank. Because the hill in which the slate was contained was so precipitous, a track had to be made on the opposite bank and a second bridge built 150 yards (137m) up river. From there another track was to be cut to the main road. The men were accommodated in two huts, and there was also a blacksmith's forge and facilities for extensive operations.[46] During November two shipments of slate were sent to Melbourne where they were 'very highly thought of'.[47]

By February 1874 they were producing amongst other things school slate. Further cottages had been erected and a more substantial bridge.[48] A fifteen foot (4.5m) outlet was driven two hundred yards (182m) from the cutting into the south side of the hill to enable the cutting of a substantial body of the slate vein.[49] The gullet was about sixteen feet (5m) wide and had been driven about eighty feet (24m). The slate here was of good colour and texture but intersected by faults which meant that no really large slabs could be extracted.[50]

In August the only quarry said to be active was the Bangor - no mention was made of the Tasmanian.[51]

The Penhryn Slate Quarry was begun in August/September 1874 near the mouth of Piper's River. This was a mile from the Back Creek Goldfield (discovered four years previously) at the back of Albion Hill. A mineral lease for 80 acres (32ha) had been granted. A cutting was made in the south side of the hill and another 60 to 70 feet (18-21m) long, on the northern slope. At the far end this cut in about 25 feet (7.5m) from the surface. Works were suspended while samples of the slate (held to be superior in quality, texture and elasticity to any yet found in northern Tasmania) were presented to prospective investors.[52] In January 1875 it was reported that operations would shortly be resumed.[53]

The 320 acre (130ha) lease was sold to Messrs Lyell and Gowan of Melbourne who formed the Australasian Slate Company with a capital of £12 000. The *Examiner* pointed out that English slates were selling at £20 or more per thousand, the high price being created by the demand in France for roofing slates for houses destroyed in the late war. Mr. W. F. Roberts an experienced Welsh quarryman made the following report:

'At the present depth at which the quarry is being worked (23 feet [7m]) the quality of the slate is as good that produced from the majority of the Welsh quarries, and as greater depth is obtained I have no doubt the same rule that prevails in the Welsh quarries will hold good in the Penhryn viz., that with increased depth the quality becomes better. From my own experience in working in some of the Welsh quarries, I can say that I never saw slates of so good a

quality so near the surface as those I have now inspected. The cleavage of the slate is of a first-class character, and the slates are of a very elastic or springy nature, which is one of the most important characteristics of good roofing slates. The color is a strong blue, and I am of the opinion that neither heat nor atmospheric changes will at all affect it, and from the hard and strong character of the slate I feel confident there is no danger of decomposition; and it is eminently suitable either for roofing slates of the best quality, for school slates, or slabs, and can be worked either by hand or machinery'. Architects Messrs Crouch and Wilson, Charles Webb, Messrs Lloyd, Taylor and Wyatt, were all suitably impressed by the slate and said they would use it when it came onto the market.

Mr. W. F. Roberts was due to arrive from Melbourne with twelve to twenty men to start operations and machinery was to follow shortly.[54] The quarry covered an area 3/4 mile (1.2km) from Tam O'Shanter Bay and 14 miles (22.5km) east of Low Head. By June 1876 they had nearly completed the formation and cutting for their 3 3/4 mile (6km) tramway, and most of the woodwork and sleepers which had come from the Don Sawmills were ready for laying down.

The company under Mr Roberts management had 100 000 slates ready for shipment by June 1875. The slate was of such good quality that nine could be split to the inch (25cm).[55] One splitter managed to split, dress and stack 1 000 slates in twelve hours.[56]

Mr Pennington's tender of £1 400 for the construction (labour only) of a 3½ mile (5.6km) tramway to Tam O'Shanter Bay, a mole and wharves, was accepted.[57]

In October 1875 at the quarry on the company's No 1 section a large tunnel was being driven 280 yards (250m) from the northeastern to the northwestern side to facilitate the removal of waste. At this point it would be fifty-five feet (16.8m) from the surface. It was intended to excavate a second lower tunnel at an acute angle, which apart from removing waste would enable a 'bench' to be worked at a depth of 75 feet (22.9m). At No 2 section an open cutting had been made exposing a face twenty feet (6m) high. It was here that steam driven sawing and polishing machinery was to be erected.[58]

By February 1876 No 1 tunnel was finished, and No 2 tunnel nearly so. The manager, Roberts had also begun to systematically work the 70ft (21m) high solid slate face.[59]

The *Examiner* sent a reporter to the site in March:

"A few miles from the George Town road and on the way to the Lower Piper the works of the Industry Gold Mine are presented to view, silent and deserted, a monument of the delusive uncertainty of gold mining, and the mistaken confidence of shareholders. About twelve miles (19km) further on are the Back Creek gold mines in the same state; so that it is almost impossible for the most sanguine to suppress the gloomy foreboding with which these disasterous failures fill the mind. The Slate Quarry is situated in this immediate vicinity, and is a continuation of the range of hilly ground in which the shafts are sunk by the Back Creek Company, embracing a portion of the Albion Gully at which place several Chinamen still

make a fair living by the aid of a sluice box.

On arriving at the quarry the commodious and substantial dwelling house in course of erection for the manager is first seen, and a short distance further on a large store has been built, and well stocked by Messrs Cummings, Henry, and Co., River Don, and is managed by Robert Trail. This supplies a want that has long been felt by the settlers for miles round, and although the building has only just been erected Mr Trail has already received a good deal of support and encouragement. There also for the present is the Post-office, where the mail is delivered twice a week, but Mr Roberts is the gazetted postmaster. Operations have been carried on at the quarry for about nine months by Mr Roberts with a limited number of men (most of these at piece work, in an economical but thorough manner. The opening out and tunnelling the quarry at four different levels, and the quality and quantity of slate showing in the drive on the third level, would convince the most prejudiced that the company has at least an unlimited supply of slates, while those already manufactured give proof of most superior quality. Two stopes have been thoroughly opened with the most gratifying results, the quality of slates obtained far exceeding the most hopeful anticipations of the manager; for as it is an established fact in England and Wales as well as the adjoining colonies, that the deeper the stopes, the better the material, he was prepared to find a rather inferior article near the surface. A considerable quantity of prepared and ornamental slates is at present on hand. Now the preliminary work is almost completed, the company intend to double the number of workmen, and there will be a very large quantity of slates ready for shipment by the end of July, when the tramway in course of construction will probably be completed. From the third level which has been tunnelled a length of 250 feet (76m) the cleavage is so perfect, and the plates so very thin, that they are quite elastic and exceedingly light. Having ascertained the computed weight of the same sized slates, 20 inches by 10 (50 x 25cm), of the best quality obtained at 'Port Dinorwic, Bangor, North Wales, from a price list, dated 1st January, 1872, which Mr Roberts kindly supplied me with, we selected six of the slates from this level and weighed them with the following result:-

Port Dinorwic slate av. weight about 3lb 11oz, (1kg 673g)
Australasian Slate Quarry ditto 2lb 9oz (1kg 162g)

showing a superiority of which the colony may well be proud. A difference in weight of every thousand slates of half ton less than the Welsh article is an item that must ultimately establish the reputation in the Australasian quarry. Another noticeable and pleasing feature in connection with the works is the inexpensive machinery and implements required to open out and prepare for market a perfectly finished and ornamental article. A fancy cutter, costing twenty-five pounds, is the only outlay required in addition to the ordinary tools. Another advantage claimed by the manager is that the percentage of water in their slates is one and a half per

cent less than any other known quarry thus lessening the liability to crack through contraction and expansion. At the Albion Gully, about half a mile south of the works I have described, and a continuation of the range, two or three drives have been made, and the quality of the material found is fully equal to that obtained at the northern end; but the work is only being carried on at the northern end nearest the tramway.

Before leaving this scene of operation for Tam O'Shanter Bay, I paid a visit to a tunnel being made due north through the hill at the Albion Gully, also under the supervision of Mr Roberts, for the purpose of discovering the gold reef fully believed to exist in that place through the many very fine specimens that have been picked up in the locality...
[The tramway to Tam O'Shanter Bay] is being constructed by Mr Samuel Pinnington, of Launceston, from the nearest point of the quarry to the proposed wharf at Tam O'Shanter, a distance of three miles and fifty three chains (5.890km), on a two feet six inch [76cm] gauge, together with a breakwater fourteen feet [4.3m] high, ten feet [3m] wide on the top, and extending one hundred and sixty feet [49m] from high water mark into the Bay for £1 400, the whole of which will probably be completed by August next. The line runs along an almost level tract of country, a contrast to the hilly ground between it and Launceston. Mr Pinnington has had a great deal of experience, having been four years on a Queensland line, and three years each inspector on the L. and W. Railway and on the Main Line. Active work is commenced on the line already, and there will be upwards of forty men employed directly. The harbor at the bay appears to be a mistake. A first impression of its safety is most unfavourable. The Fourteen Mile Bluff gives protection for vessels from a nor'-wester, but the bay is exposed to the north-east; and although more connected with the works assert that a sunken reef at the mouth of the bay breaks the fury of the waves, and the bay itself is comparatively tranquil while a storm is raging outside, owners of coasters look upon the situation as most dangerous and have no confidence in the protection of the proposed breakwater...[60]
When they were nearer completion the breakwater and wharf were described again: 'At 300ft [91m] out into the bay from low water mark, there is a depth of 17 feet [5.2m] at low water, and the company intend to excavate a sort of dock inland from low water mark, 200 feet [60m] wide, and running back 180 feet [55m], with wharves at one side and end where ships may load and lie in safety. From the western side of this dock a break-water will be projected, with log framework filled in with stone, and with a sloping rough stonework wall on the seaward side.[61]

The tramway was formally opened in March 1877. Fifty passengers and a number of slates were conveyed by four trucks to Tam O'Shanter Bay in about forty minutes. The trucks were adorned with flags and the employees' wives were in holiday dress. At Tam O'Shanter Bay the women prepared refreshments and the men put up swings and organized children's games.[62]

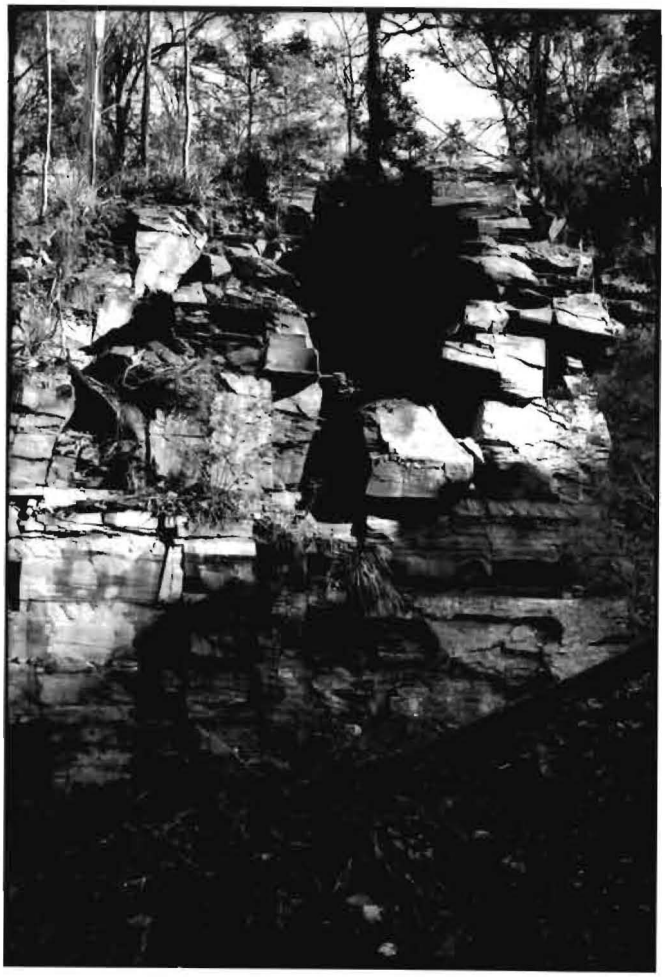
Mr Townshend the company's engineer estimated that about half a million slates were awaiting shipment, 30 000 of which were sent to Melbourne on the *Rubicon* on 3rd April. The Melbourne *Daily Telegraph* wrote that they were 'already prepared for the slater in a variety of shapes, square, rectangular, and arched, and competent judges report them to be equal, if not superior, to the best Welsh imported'.[63]

Several shipments later Tam O'Shanter Bay was renamed Slate Port.[64] The slate improved as a greater depth at the quarry was reached, and orders came pouring in from Hobart, Melbourne and Sydney (where the architects were said to prefer them to the British article).[65]

Little more was heard of this quarry. Walch's Almanac lists it between 1882 and 1885 - and in December 1885 the Launceston *Daily Telegraph* reported:

'The Penrhyn Slate Quarry has gone very quiet of late, though splendid slate it really is, and in the heart of the slate country it does seem strange that such valuable property should lie dormant even for a short time, as capitalists are sure to get a return for their money. Messrs M'Kenna and Gee are, I believe, joint proprietors'.[66]

Bangor Tramway
(8215 St Patricks (55GEQ 010355)



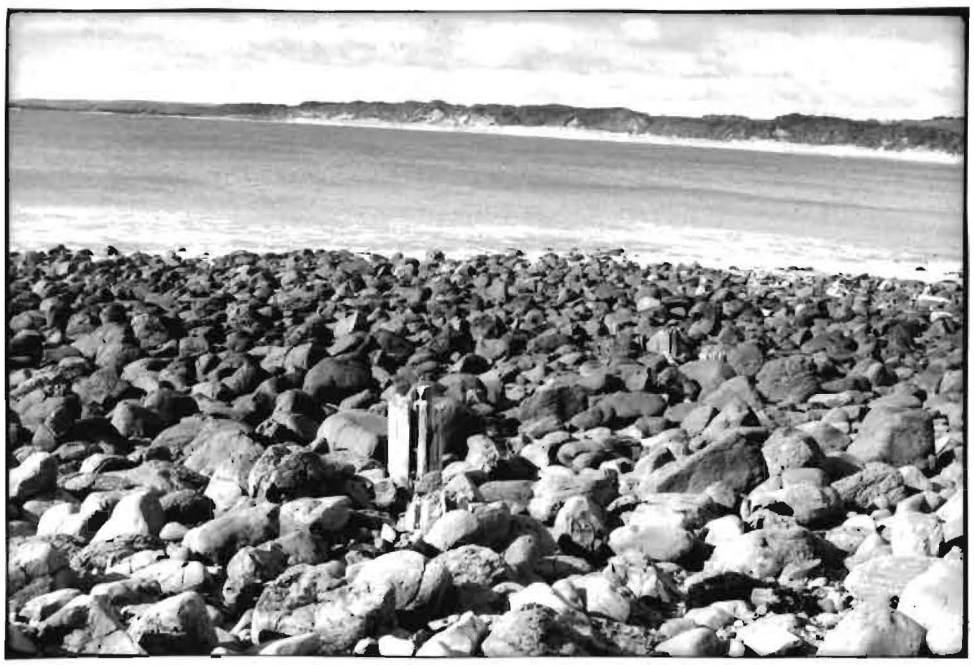
Bangor Slate Quarry

(8315 St Patricks 55GEQ 110366)

Bangor Church
(8315 St Patricks 55GEQ 115369)

Bangor Schoolhouse
(8315 St Patricks 55GEQ 114370)

Australasian Slate Quarry
(8315 St Patricks 55GEQ 044565)



Tam O'Shanter Bay. Remains of pier
(8316 Ninth Island 55GEQ 056616)

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63. *Launceston Examiner* 14/4/1877

64. *Launceston Examiner* 9/6/1877

65. *Launceston Examiner* 4/8/1877 and 2/10/1877

66. *Daily Telegraph* 1/12/1885

CHAPTERS SEVEN & EIGHT

ASBESTOS, GREENSTONE AND PAINT

1. Asbestos trenches } C. B. Burton and
2. Asbestos quarries } Wunderlich
3. Greenstone quarry. H. Condor's land
4. Asbestos trench. A. Charriot's land
5. Ochre Mine
6. Wunderlich Mill

CHAPTER SEVEN

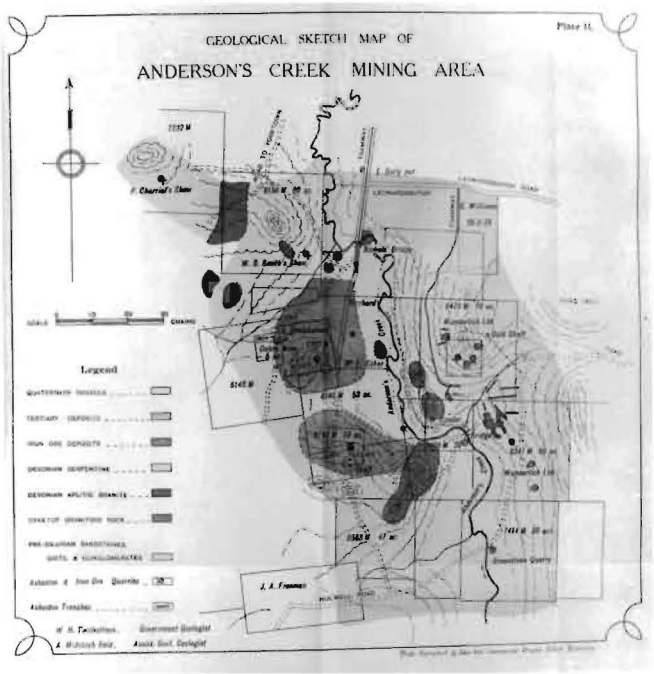
ASBESTOS - WEST TAMAR

Although the Asbestos Ranges were referred to by G. W. Evans, Surveyor General as early as 1820, no mention was made of its possible usefulness.[1] Historically asbestos had been woven into shrouds used in cremation to prevent the ashes from the corpse mingling with the ashes of the pyre, but it was not until 1868 that the Italians started commercial production.[2] Until the mid 1890s only pure and long fibre asbestos was in demand.

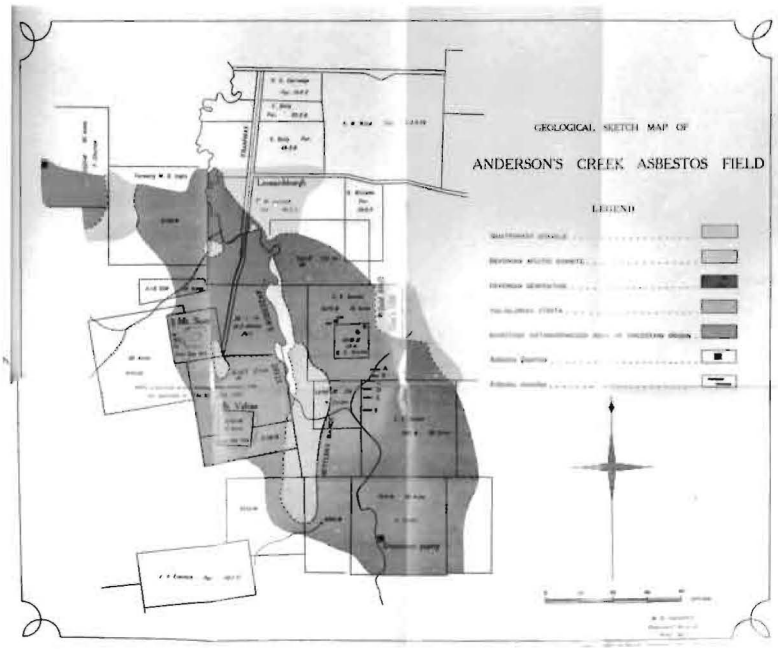
The government surveyor G. Thureau, wrote of the Anderson Creek asbestos in 1883: 'As the length of fibre is... a great desideratum for practical purposes, and also the concentration... of these asbestiferous deposits in strong veins, the workings there made are so far not sufficiently advanced to enable one to pronounce favourably upon the deposits discovered hitherto. It should be born in mind that the mining and the treatment of what are now simply impregnations, are rather expensive. I do not think, unless the prospects have materially improved since my last inspection, that more than two per cent of asbestos could be expected; none of the fibrous vein-stuff was more than nine inches [23cm] in length, as against those of Gundagai NSW of nearly two feet three inches [69cm]. It is to be hoped, with the rapidly increasing demand for this incombustable, that future developments will take place.[3]

In 1896 a new product 'asbestic' was produced by the Danville Asbestos and Slate Co. in Canada. This was made of crushed serpentine rock permeated with thin veins of asbestos fibre, mixed with lime. The mixture was used as plaster and considered better than the usual mixture with animal hair, as it was germ free.[4] The Secretary for Mines noted the following year that attention was being directed to the utilization of the asbestos which was known to exist in considerable quantities in the vicinity of Beaconsfield.[5]

In 1899 the Australasian Asbestos Company was formed in Victoria.[6] In the second half of 1899 the Australasian Asbestos Company took up five sections - 1772, 1773, 1774, 1775, 1935-93-m situated on Andersons Creek about 2 miles (3km) west of Beaconsfield. The Secretary for Mines stated that 'the owners at once began shipping the material in bulk with the view of establishing their market, and there are indications that this novel industry will prove a profitable one. This start has already had the effect of stimulating search for profitable asbestos deposits in other parts of the colony.[7]



1919
(Department of Mines *Geological Survey Report* No 8)



1917
(Department of Mines *Geological Survey of Mineral resources* No 4)

'The Company', wrote W. H. Twelvetrees the government geologist, 'lay great stress upon a variety of asbestiform rock, which is not so pure nor so delicately fibrous as the vein chrysolite, but to which they are devoting their exclusive attention. It is a somewhat massive "cotton-stone", with matted, interlacing fibres and enclosing less decomposed fragments of rather soft, and sometimes, pasty serpentine rock. On crushing these fragments they are reduced to a talcose, often minutely fibrous, material. This variety is what the company call "asbestic", a fibrous matted asbestos mixed with earthy, partly decomposed, magnesian rock. A few years ago such rock in asbestos quarries was neglected as so much waste, but it is now worked up and largely used for lining and plastering purposes, for which it is extremely useful, setting quickly and hard, needing no hair nor sand, and being incombustible. Asbestic proper, then, is a manufactured article, an asbestos plaster, in which the short fibre-stuff and impure varieties of asbestos are used. Laid over wood work, it renders the structure fire proof, under ordinary conditions. It is durable, and besides being tough, it is elastic, a very valuable quality in a plaster; for it is not liable to crack when walls settle after building... the advantages just enumerated at once created a strong demand for the article, and there is now more asbestic sold in the world than asbestos. The Danville mines, however, are said to be running out of stock, and it is anticipated that the Tasmanian industry will feel the benefit thereof'.

Twelvetrees went on to describe the site:

'About 20ft [6m] below the S. brow of the hill a face 12ft [3.7m] wide has been cut into a seam of natural asbestic for a height of 10ft [3m]. From this bench 100 tons were broken recently, bagged, and shipped to Melbourne. The seam is running N.22°W., and is traceable 150ft [45m] further up the hill, where it would gain 10ft [3m] additional backs. Thirty feet [9m] below the floor of this bench a second bench is being cut in asbestic rock, which will give, when advanced into the hill, a face 50ft [15m] high, and ultimately 50ft [15m] wide. When I was there nine men were at work in one shift. A tramway 232ft [71m] long conveys the stone to the tip, the waste forming one side of the embankment, and cobbing stuff being thrown on the other side. The material from this cut, however, is not being bagged, as it is intended to junction with the top cutting and work the face where the fibre is better. The seam or band of asbestiform rock is good jumping ground and the mining cost, inclusive of dead-work, of the first 100 tons did not exceed 3s6d a ton. With a face such as that now in preparation, marketable stuff ought to be broken out for more than 1s a ton, providing the proper quality is maintained. At present 6s per ton has to be paid for transport to Beauty Point and thence 9s 6d a ton per Union Co.'s steamer via Launceston to Melbourne'.[8]

About 200 feet [60m] south of the above is an old tunnel which has been driven east with a long approach. Some good fibre has apparently been obtained from this point, as evidenced by the existence of an old knapping-floor. South of the tunnel are some knobs of hard bronzitic rock, and no further prospecting has been done in this direction'.[11]

Neither the Durabestos Co. nor P. Charriol whose lease was situated just over a mile northwest, were at this stage contemplating the erection of a treatment plant, which was vital if a healthy industry was to be started, but a costly exercise should the asbestos turn out to be unworthy. Twelvetrees in his report described the process of asbestos production as it was carried out elsewhere.[12]

By December 1917 the Durabestos Co. had erected the first asbestos ore treatment plant to be established in Australia described by Mr Hartwell Conder:-

'The mill is built largely of the panelling slabs made by the Durabestos Company of Sydney, the owners of the property. These are 8 feet [2.4m] by 4 feet [1.2m], and give a handsome finish to the building [which measured 40 feet (12m) by 50 feet (15m)[13]]. The system of crushing is simple. The ore is passed through rock-breakers [Blake jaw-crushers and Gates rotary crushers] and rolls till about the size of kidney beans. It is then fed to a disintegrater, with revolving dish and beaters. This machine breaks up the brittle portion of the rock to find sand, but fluffs up the asbestos till it has the appearance of crude cotton. This product is delivered to a shaking screen, through which the sands pass while the fluff passes down to the lower end. A narrow spout connected to a suction fan here extends right across the screen, with mouth close down to it. The fluff is at once caught up by the suction, and is delivered to a settling chamber [this machine would have normally been a 'Cyclone' which consisted of two screw propellor beaters driven at 2000 revs per minute in opposite directions, but due to war shortages a wattle bark disintegrator was used]. There are two chambers, and as one is filling the ore is being bagged up for shipment in the other. [The plant was driven by a 35hp (26kw) portable engine.]

The most troublesome feature is the dust, but fortunately it is not of a cutting nature, so that neither to the men nor to the machinery does it carry the danger that quartz or other gritty dust is bound to. [The carcinogenic properties of asbestos were not realised until thirty years later]. In any case, however, this problem is being dealt with, and by the use of fans and enclosing the machinery, it will shortly be overcome.

At present very satisfactory results are being obtained, and if the grade of ore can be maintained, the success of the enterprise is undoubted. With regard to this important point, there is the assurance that the whole bulk so far removed from the quarries is of

payable value, and there is no reason to anticipate either laterally or vertically any lessening of grade limits that will yield a very large tonnage. In fact, even better- grade ore and larger tonnage may be revealed as the ground is opened up and the habits of the minerals become more familiar. In any case, the undertaking serves a useful purpose in relieving the tonnage that must be shipped into Australia in these present days, and in showing once again that Australia is well supplied with the raw materials needed for manufacture, and can make good use of them when proper scope obtains.

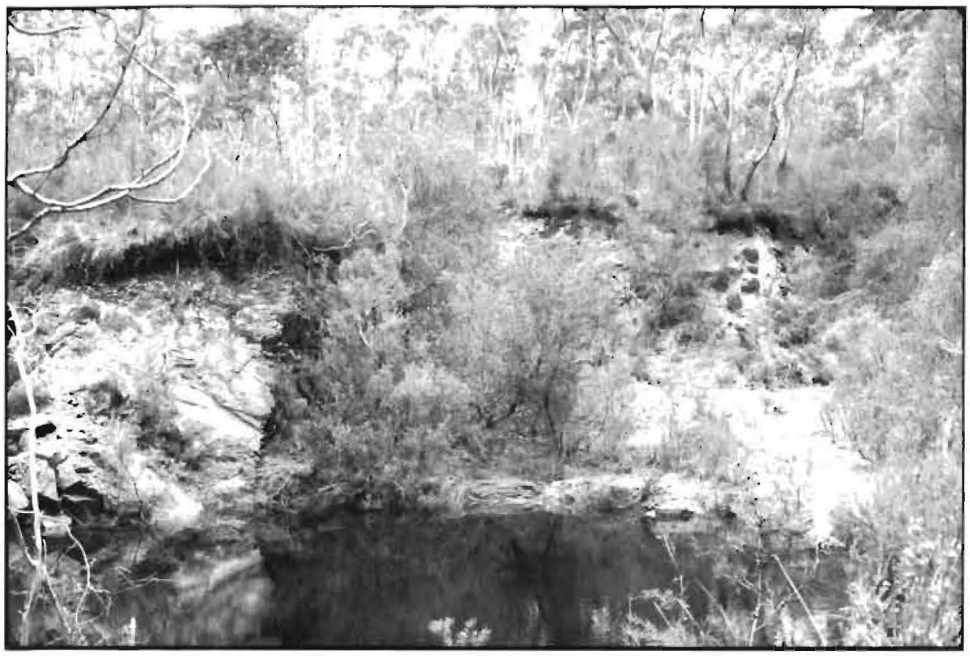
Mr H. Masters is in charge of the mine, and Mr G. Gurman, who has experience in Canadian mills, is in control of the mill.[14]

At the end of the war the Secretary for Mines wrote a short essay on the effect of the war on the mining industry in which he stated that 'during the war manufacturers of asbestos roofing-slates on the mainland were unable to procure their fibre from Canada as usual, and had to fall back on the Tasmanian deposit, near Beaconsfield, for the time being'.[15] The Company managed during 1918 to produce 2 854 tons (2 911 tonnes) of asbestos valued at £5 008, and employed forty eight men. However, the mine was poor and an extensive search for richer deposits was fruitless. 'It is doubtful', wrote the Secretary for Mines, 'if the mine would be working had it not been for the difficulty of importing asbestos during the War'.[16] In that year the leases were transformed to the Wunderlich Co. Ltd. but by 1919 they too had ceased all quarrying operations and moved the milling plant to their properties at Baraba in New South Wales.[17]

In a return published in 1922 the quantity and value of asbestos produced was given as follows:-

	Tons	£
1899	200	363
1900	128	113
1901	46.5	45
1902-15	-	-
1916	15	30
1917	271	271
1918	2 854	5 008
1919	51	1 275
1920-22	-	-

[18]



Asbestos Quarry Anderson's Creek
(8215 Tamar 55GDQ 805393)

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CHAPTER EIGHT

PAINT - WEST TAMAR

The spectacular pigments produced by the decomposing serpentine at Ilracombe led to the formation of three companies. The Chromate, Asbestos, Paint and Gold L.L. was registered in 1889[1] and the lease reference was given as 2128-87-m.[2] The Secretary for Mines in July that year reported that the company was progressing with its operations. One mill had been constructed as well as other necessary appliances, tanks, buildings etc, but was not yet working on a commercial scale.[3]

Within a year operations had ceased pending the arrival of an expert manager from England as well as appliances suitable for paint manufacture on a larger scale.[4] Between 1890 and 1892 the Native Paint and Oxide Co shipped 1 000 tons of iron oxide from their lease. Most of it was used for the purification of gas in Melbourne, and realised from 27s6d to 42s6d per ton.[5]

The Serpentine Paint Company came into being during the Great War in 1917. They extended an old open drive, cut by the Native Paint & Oxide Co, from the west side line of the 20 acre (8ha) section 250 feet (76m) into the hill in a north easterly direction. The oxide colours prevalent on this section included yellow, red, green and brown. The company took over the "Loongana" shed in Launceston for its paint factory, where it produced oxide, chemical and lead paints. The process was described as follows:

'The crude oxides are purified by levigation or air separation, the specific gravity being made use of to separate the various grades of colour. In the levigating process the slimes are furnace-dried, and then ground to a very fine powder. This passes to a pug mill, and is incorporated with pure linseed oil; it then goes through the granite rolling machine, thus precluding any chance of burning the pigment and changing the colour; thence it passes through steel roller mills where it is reduced to the consistency of stiff paste and finally emerges as paste paint of the very finest quality.

This paste is conveyed to the mixing vat and the necessary quantity of linseed oil, turpentine, and a very small proportion of drier added to make it liquid paint. Rotary planes, electrically driven, thoroughly mix the paint which is taken to the finishing cone mills, whence it is run directly to the containers, ready for market. This thorough mixing secures perfect suspension and absence of deposit on the bottom of the tin. The company guarantees that

no adulterant of any kind is used in the manufacture.[6] Apart from the Company's two mines near Beaconsfield they leased a third near Mowbray. It was known as the Old Paint Mine Hill and had, apparently, been worked some twenty years earlier by a company which was never floated.

Mr Flouder of Adelaide a reputable practical adviser reported the pigment, particularly the red oxides, to be of the finest staining capacity, and the pale buff and terracotta had very pure and rich colour and toning. They were, he said, the finest oxides he had handled, easily converted to paint, free from grit and clay. J & T Gunn tested the crude ochres and found them most satisfactory. The lasting properties of the pigments were tested by a painter, Les Cooper of Longford. He painted an iron roof with both the red and the yellow, and felt it to have a good flow and covering body. In the five months since it had been put on, it had kept its gloss and body well. Mr. E. R. Mason, painter to the Launceston Corporation wrote: 'I was much pleased with both paints. They are of excellent quality, very free and very good in covering power. I consider them superior to any imported paint that I have ever used, and I have had 40 years' experience in paint-mixing and painting. If I could get this paint I would not use the imported article'.[7]

Shipping restrictions and strikes after the war, severely hampered both the Serpentine Paint Co and Lead Sulphate Ltd. The scarcity of linseed oil was the main draw-back.[8] By 1920 twenty-six colours were produced and eighty-seven men employed. On the King's wharf the Lead Sulphate Ltd erected two electric furnaces for the manufacture of white-lead, and employed twenty-five men.[9] This Company was later referred to as the Sulphate White-Lead and Paint Works Co and had by the end of 1921 resumed operations, having been idle due to lack of funds.[10] Only six men were reported to be working at the Serpentine Paint Co in 1922,[11] but it was still operational in 1937.[12]

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APPENDIX A

SIGNIFICANT REMAINING INDUSTRIAL STRUCTURES - SITES

Name: Ilfracombe Iron Company

Date: 1873

Style: Victorian Industrial

Material: Stone and steel

Architect:

Builder:

Use: Furnace

Condition: remnants only

Map grid: 8215 Tamar 55GDQ 821344

Refs: pp.38-39

Drawings:

Other listings: no listing

Name: Tasmania Mine Reduction Works

Date: 1894

Style: Victorian Industrial

Material: Concrete and timber

Architect:

Builder:

Use: Reduction works/Battery

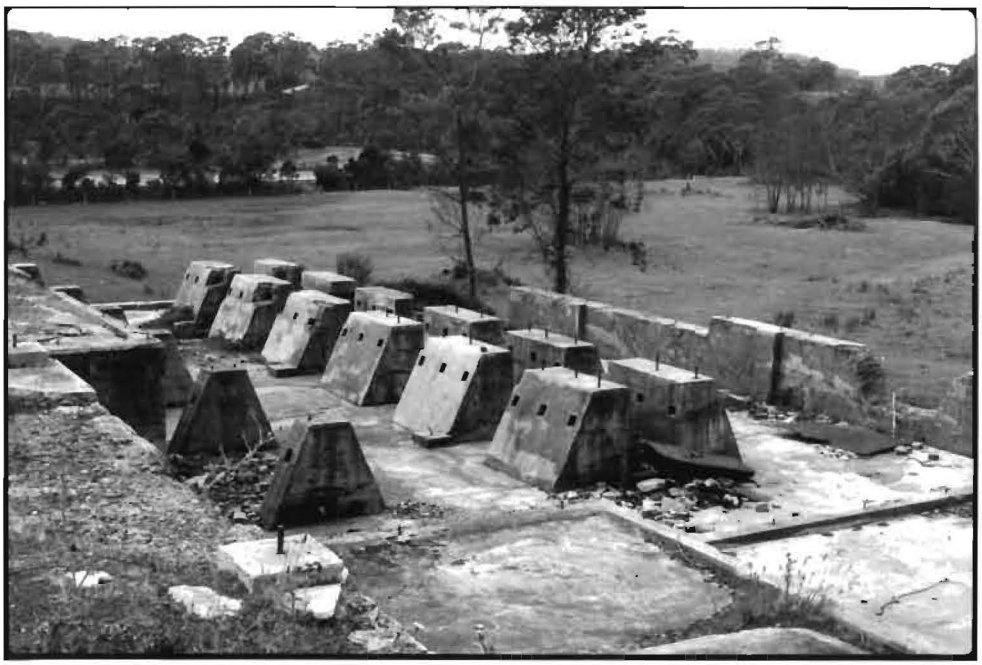
Condition: Only remnants

Map grid: 8215 Tamar 55GDQ 861387

Refs: pp.69-72

Drawings:

Other listings: no listing



Name: Tasmania Mine and Boiler House. Grubb and Hart Engine Houses, Welt Street, Beaconsfield.

Date: 1904-1905

Style: Italianate

Material: Brick

Architect:

Builder:

Refs: pp.73-75

Use: Engine rooms and boiler

Drawings: Machinery drawings in Queen Victoria Museum

Condition: Facade good

Other listings: National Trust Classified

Name: Tasmania Mine Manager's House, Welt Street, Beaconsfield.

Date: c.1890

Style: Victorian vernacular

Material: Brick

Architect:

Builder:

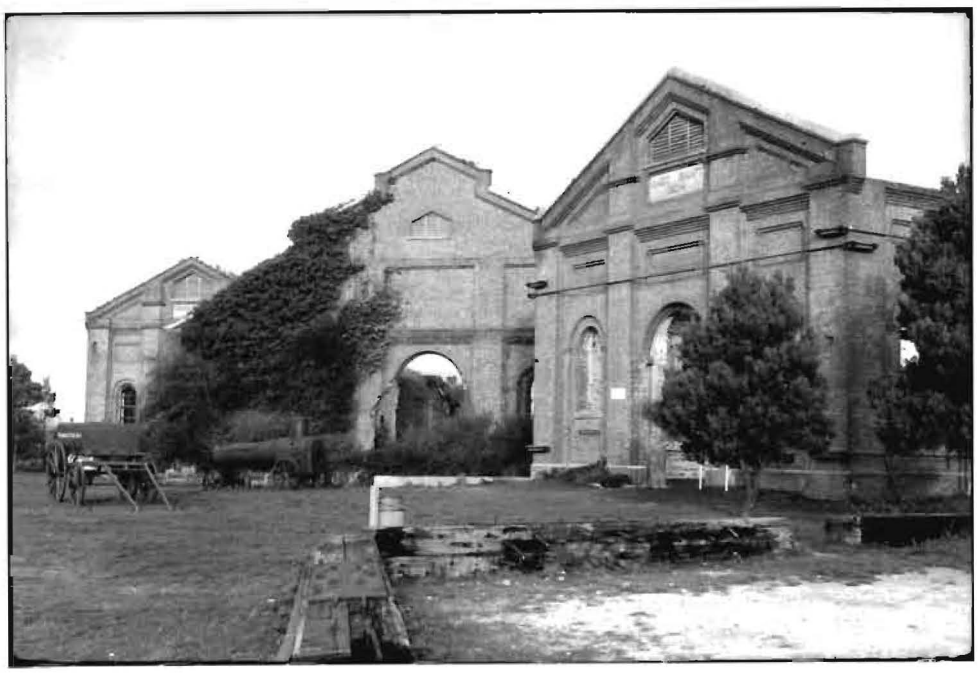
Refs:

Use: Residence, now Council Chambers

Drawings:

Condition: excellent

Other listings: National Trust Registered



Name: Government Limeworks Site

Date: 1804 onwards

Style: Industrial vernacular

Material: brick

Architect:

Builder:

Use: Limeworks

Condition: Remnants only

Map grid: 8215 Tamar 55GDQ 865394

Refs: pp.3-4

Drawings:

Other listings: no listing

Name: Mt Vulcan

Date: 1872

Style:

Material:

Builder: British and Tasmanian Charcoal Iron Company quarry and Harrison's furnace

Use:

Condition: Remnants only

Map grid: 8215 Tamar 55GDQ 800390

Refs: pp.20-38

Drawings: p.30

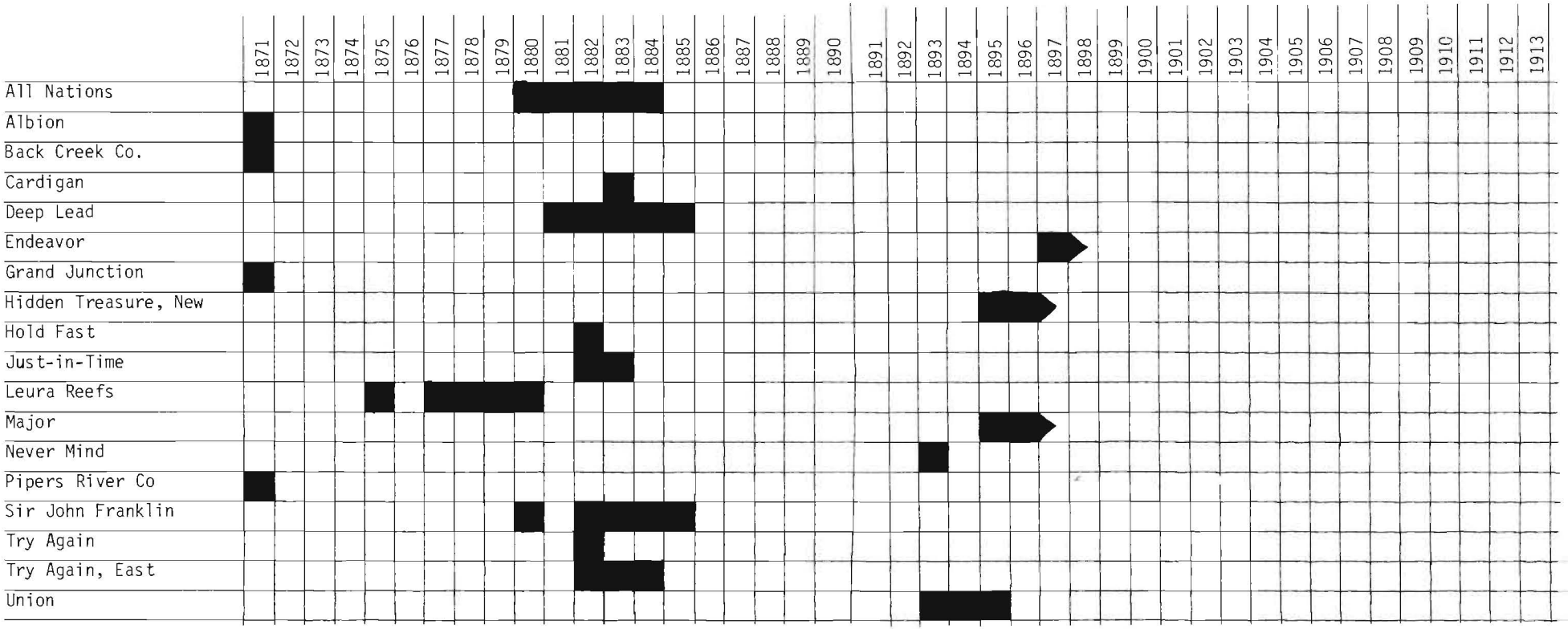
Other listings: no listing

APPENDIX B

LIST OF GOLDMINES REGISTERED PRIOR TO 1914

Note: This information has been compiled from *Walch's Almanacs*. After 1896 only new registrations were listed. Arrows indicate that mines may have continued in operation after the dates marked.

BACK CREEK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1911
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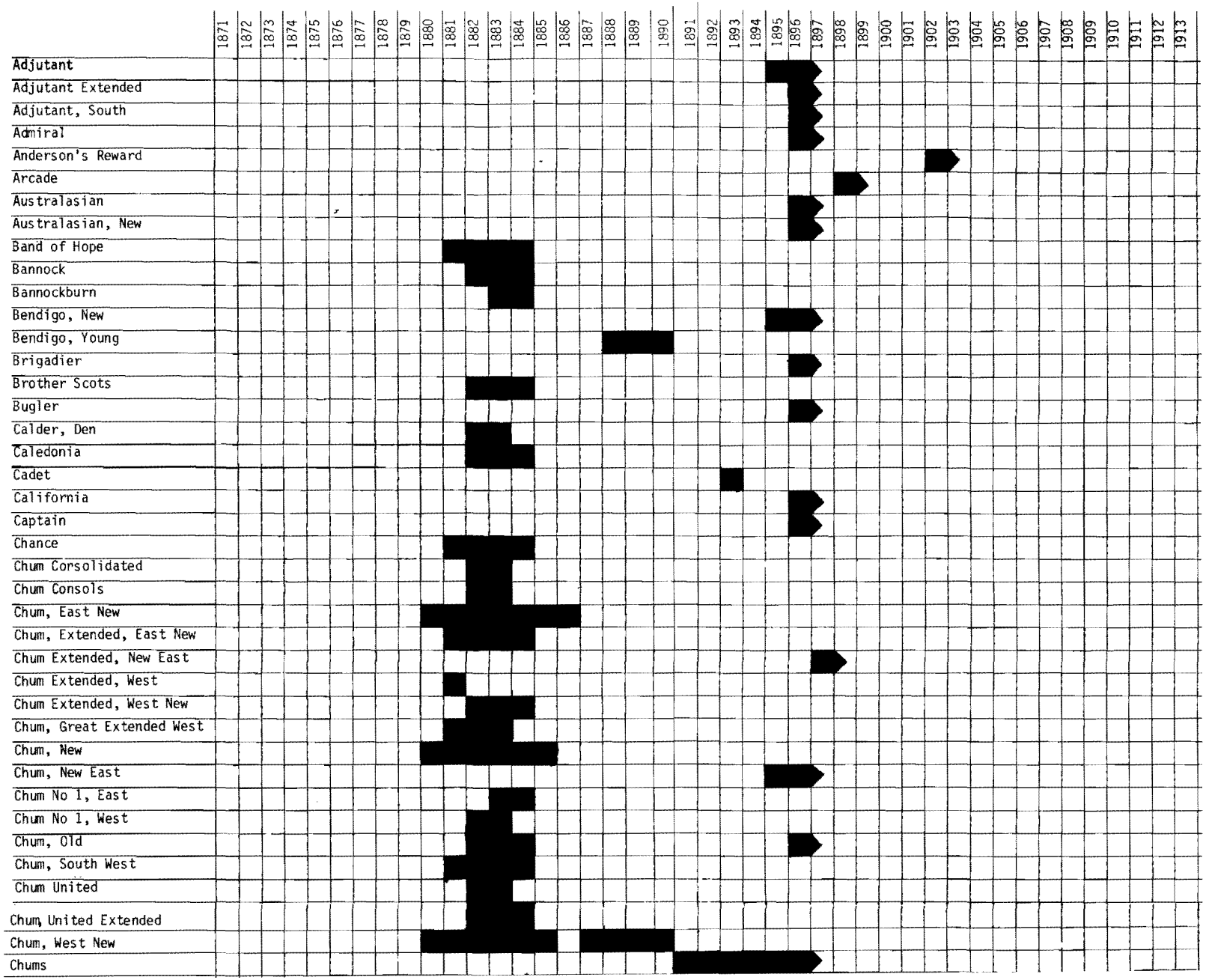
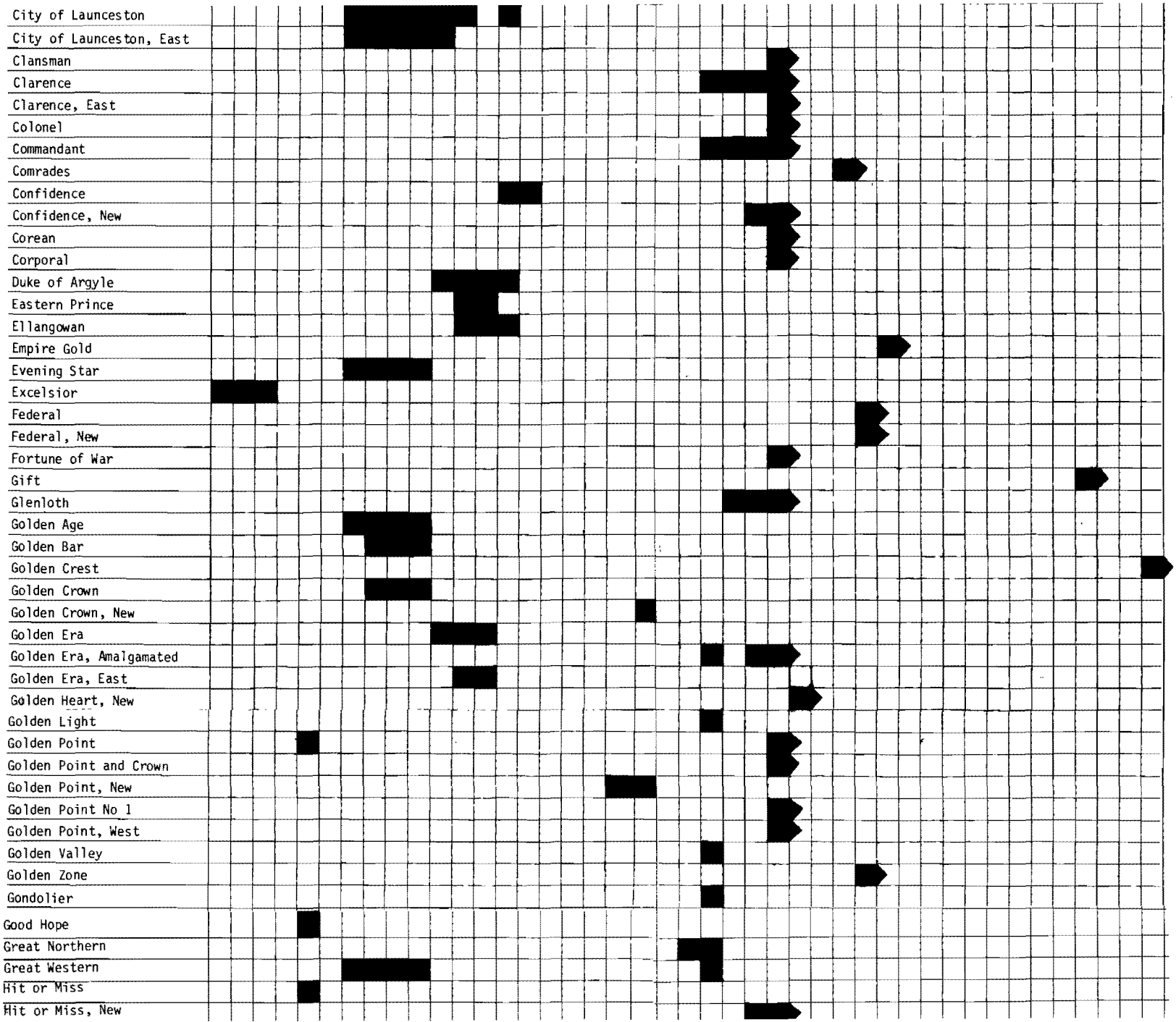
All Nations
Albion
Back Creek Co.
Cardigan
Deep Lead
Endeavor
Grand Junction
Hidden Treasure, New
Hold Fast
Just-in-Time
Leura Reefs
Major
Never Mind
Pipers River Co
Sir John Franklin
Try Again
Try Again, East
Union

LEFROY/NINE MILE SPRINGS




City of Launceston
City of Launceston, East
Clansman
Clarence
Clarence, East
Colonel
Commandant
Comrades
Confidence
Confidence, New
Corean
Corporal
Duke of Argyle
Eastern Prince
Ellangowan
Empire Gold
Evening Star
Excelsior
Federal
Federal, New
Fortune of War
Gift
Glenloth
Golden Age
Golden Bar
Golden Crest
Golden Crown
Golden Crown, New
Golden Era
Golden Era, Amalgamated
Golden Era, East
Golden Heart, New
Golden Light
Golden Point
Golden Point and Crown
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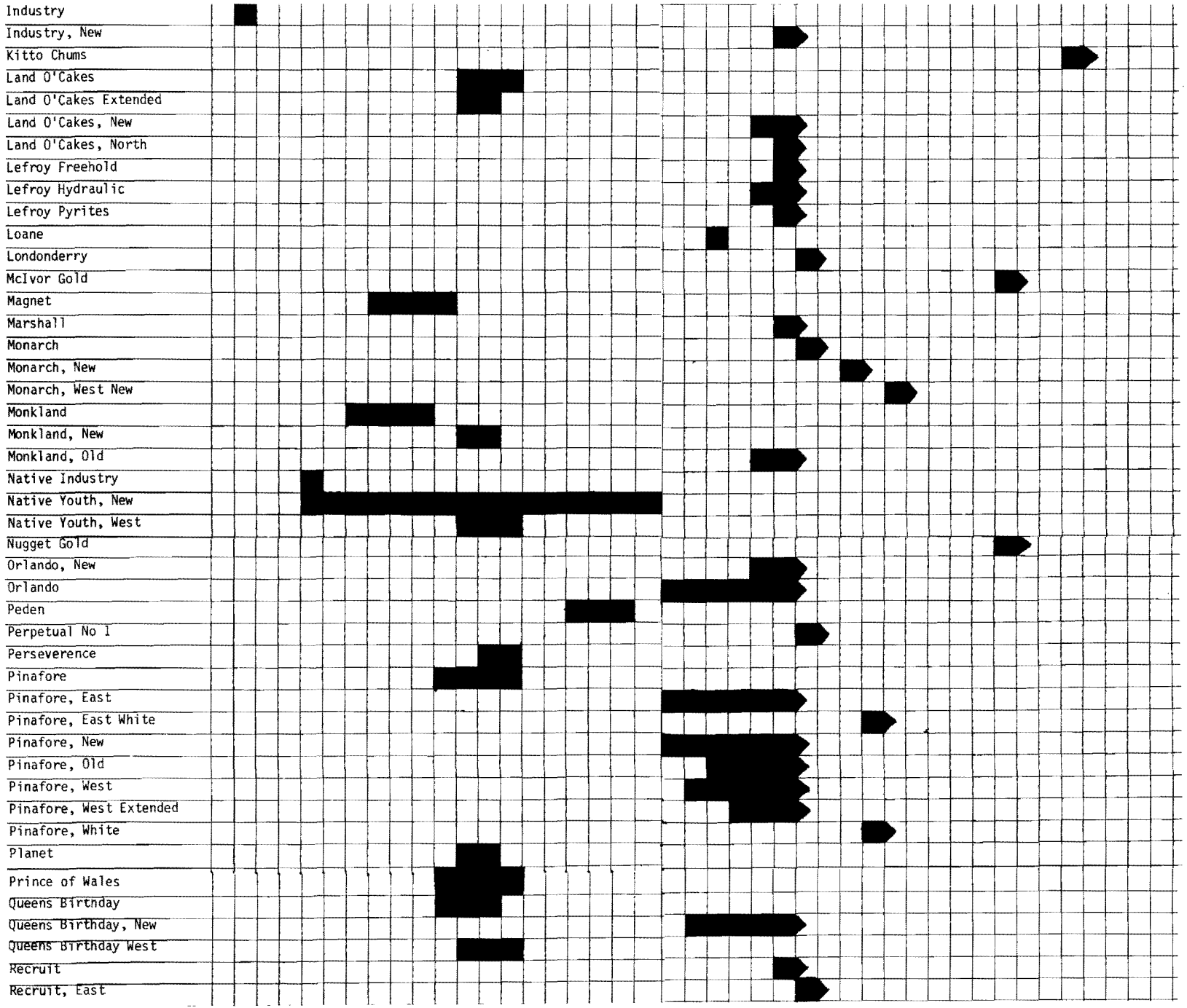
Golden Zone
Gondolier
Good Hope
Great Northern
Great Western
Hit or Miss
Hit or Miss, New


Industry
Industry, New
Kitto Chums
Land O'Cakes
Land O'Cakes Extended
Land O'Cakes, New
Land O'Cakes, North
Lefroy Freehold
Lefroy Hydraulic
Lefroy Pyrites
Loane
Londonderry
McIvor Gold
Magnet
Marshall
Monarch
Monarch, New
Monarch, West New
Monkland
Monkland, New
Monkland, Old
Native Industry
Native Youth, New
Native Youth, West
Nugget Gold
Orlando, New
Orlando
Peden
Perpetual No 1
Perseverence
Pinafore
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Pinafore, East White
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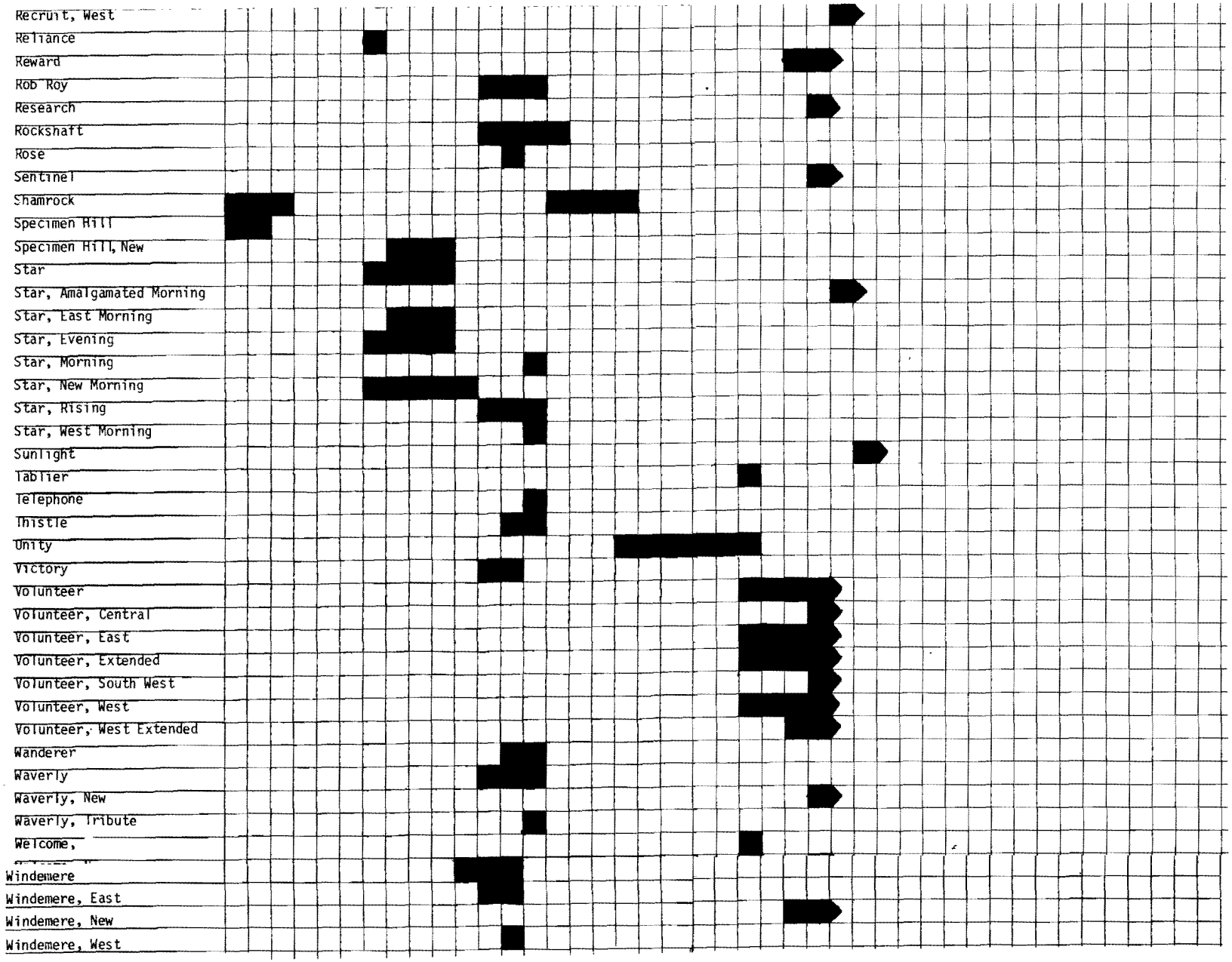
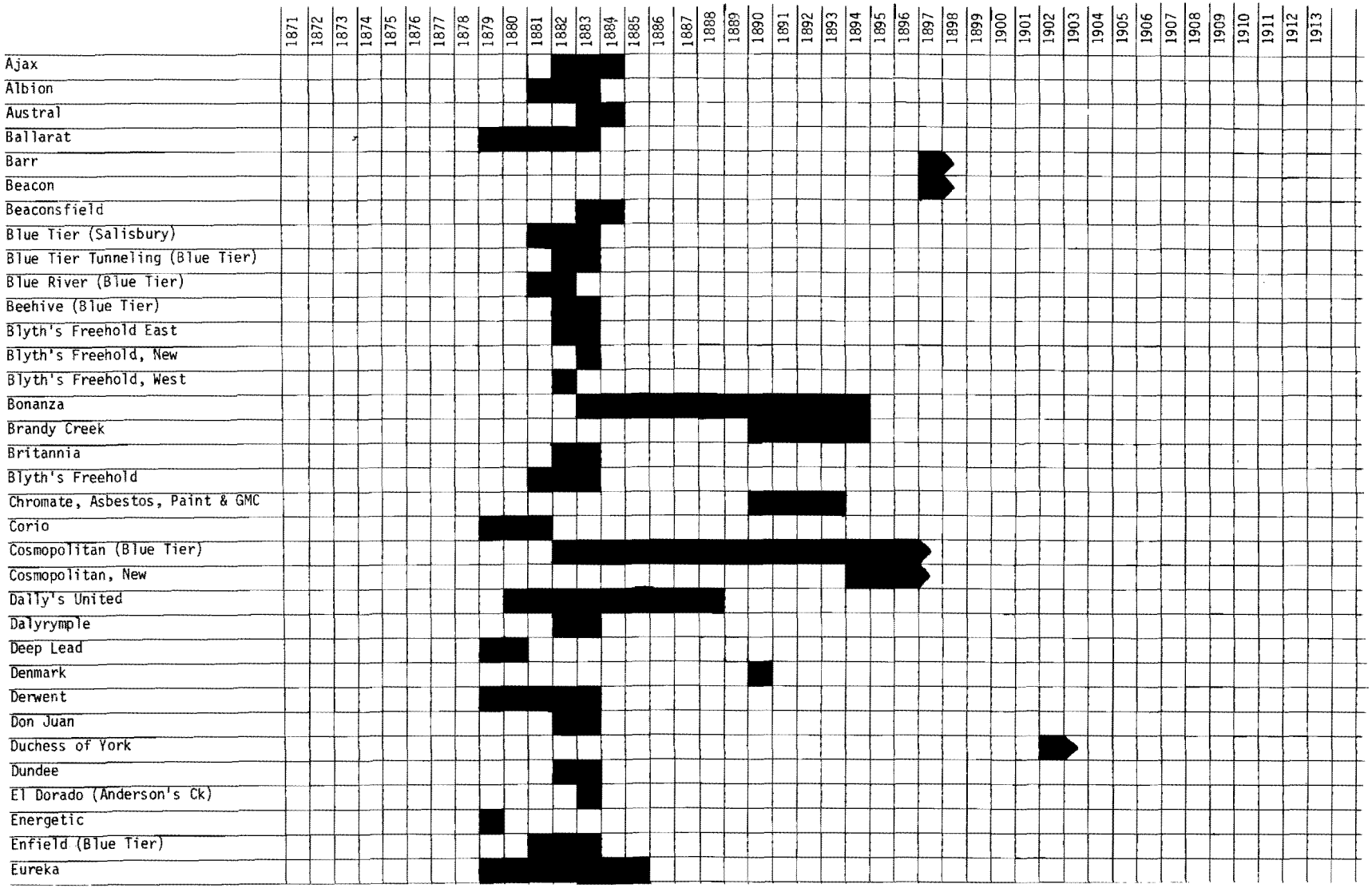
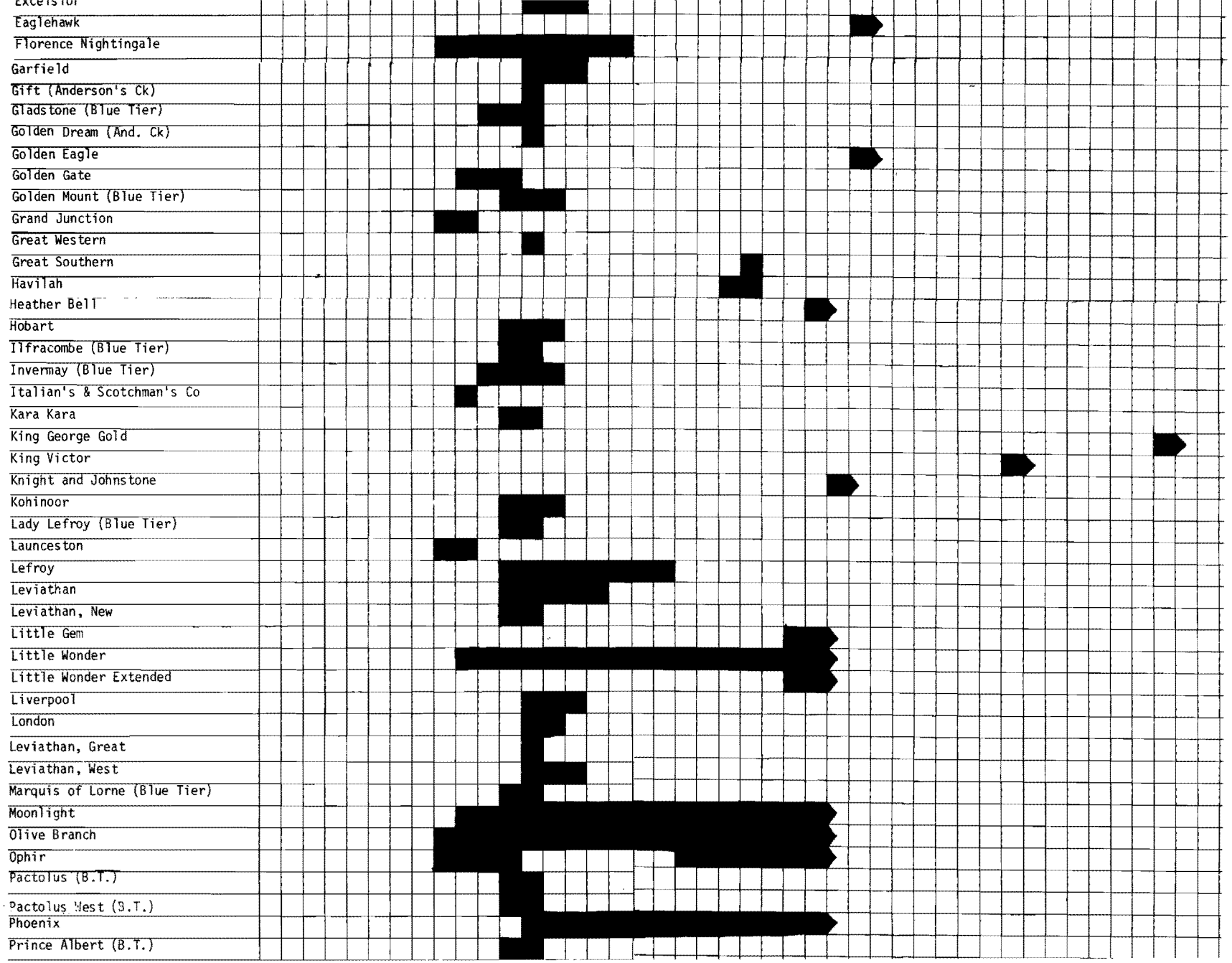
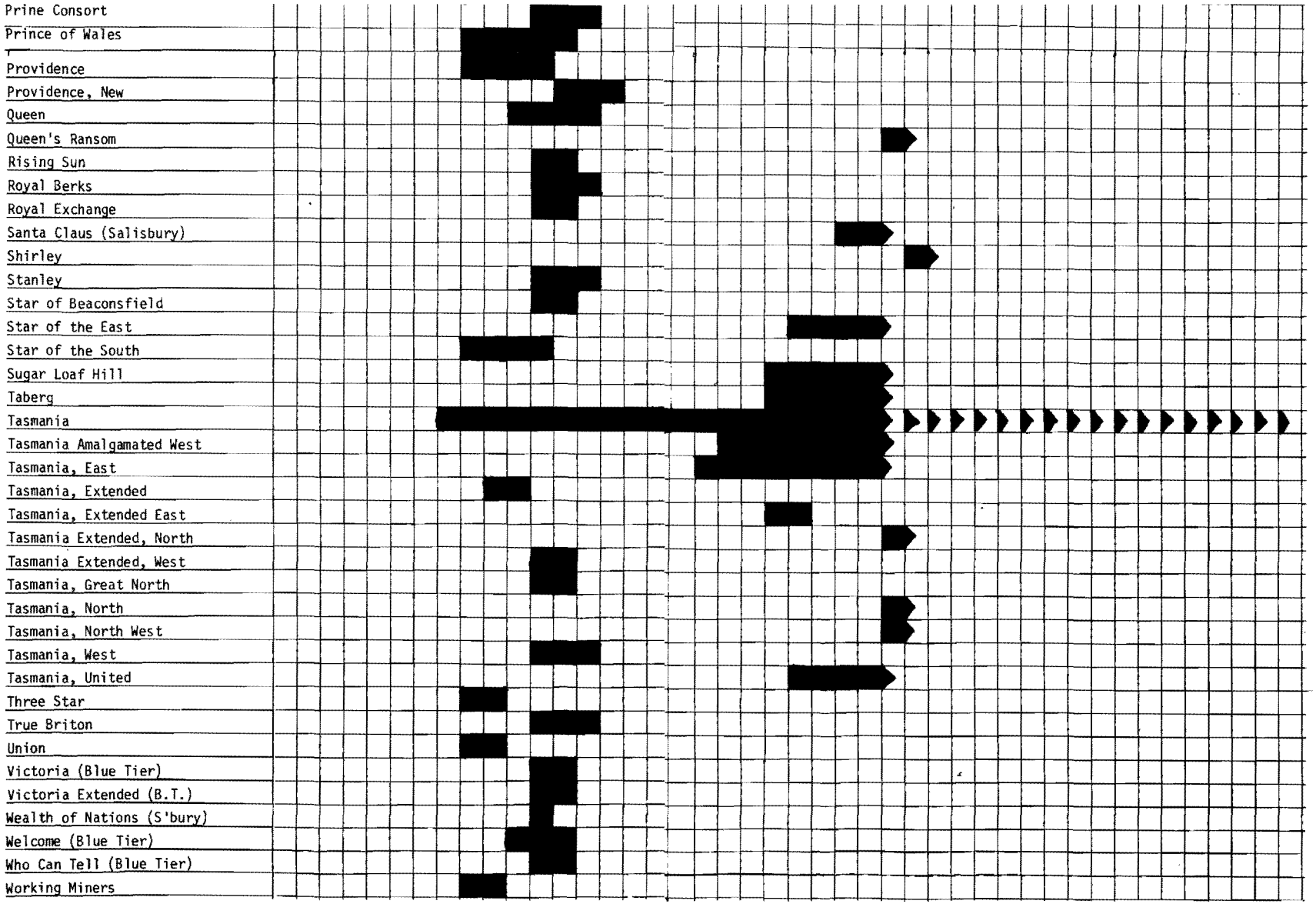
Recruit
Recruit, East


Recruit, West
Reliance
Reward
Rob Roy
Research
Rockshaft
Rose
Sentinel
Shamrock
Specimen Hill
Specimen Hill, New
Star
Star, Amalgamated Morning
Star, East Morning
Star, Evening
Star, Morning
Star, New Morning
Star, Rising
Star, West Morning
Sunlight
Tablier
Telephone
Thistle
Unity
Victory
Volunteer
Volunteer, Central
Volunteer, East
Volunteer, Extended
Volunteer, South West
Volunteer, West
Volunteer, West Extended
Wanderer
Waverly
Waverly, New
Waverly, Tribute
Welcome,
Windemere
Windemere, East
Windemere, New
Windemere, West

BEACONSFIELD/BRANDY CREEK




Excelsior
Eaglehawk
Florence Nightingale
Garfield
Gift (Anderson's Ck)
Gladstone (Blue Tier)
Golden Dream (And. Ck)
Golden Eagle
Golden Gate
Golden Mount (Blue Tier)
Grand Junction
Great Western
Great Southern
Havilah
Heather Bell
Hobart
Ilfracombe (Blue Tier)
Invermay (Blue Tier)
Italian's & Scotchman's Co
Kara Kara
King George Gold
King Victor
Knight and Johnstone
Kohinoor
Lady Lefroy (Blue Tier)
Launceston
Lefroy
Leviathan
Leviathan, New
Little Gem
Little Wonder
Little Wonder Extended
Liverpool
London
Leviathan, Great
Leviathan, West
Marquis of Lorne (Blue Tier)
Moonlight
Olive Branch
Ophir
Pactolus (B.T.)
Pactolus West (B.T.)
Phoenix
Prince Albert (B.T.)


Prine Consort
Prince of Wales
Providence
Providence, New
Queen
Queen's Ransom
Rising Sun
Royal Berks
Royal Exchange
Santa Claus (Salisbury)
Shirley
Stanley
Star of Beaconsfield
Star of the East
Star of the South
Sugar Loaf Hill
Taberg
Tasmania
Tasmania Amalgamated West
Tasmania, East
Tasmania, Extended
Tasmania, Extended East
Tasmania Extended, North
Tasmania Extended, West
Tasmania, Great North
Tasmania, North
Tasmania, North West
Tasmania, West
Tasmania, United
Three Star
True Briton
Union
Victoria (Blue Tier)
Victoria Extended (B.T.)
Wealth of Nations (S'bury)
Welcome (Blue Tier)
Who Can Tell (Blue Tier)
Working Miners