

Tasmanian Tin Smelters 1874–1901

by

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INTRODUCTION

In October 1929 the Mount Bischoff smelting works in Launceston closed after operating for fifty-five years and smelting over 200,000 tons of tin ore at an estimated value to the Tasmanian economy of £20 million.¹ It was the last tin smelter in Tasmania, and the sole survivor of the tin smelters that were built in the period 1874–1900. This thesis documents the history of these smelters and examines why they were built and why they failed.

In the nineteenth century tin was widely used in pewter, solder, bronze, type-metal and for making the tin cans used for preserving food. However, tin was mined in relatively few countries. Australia was the world's largest tin producer in the decade 1873–1882 and in the 1880s Tasmania was the largest producer in Australia.² In Tasmania tin was mined at Mount Bischoff, which was discovered in 1871 by James 'Philosopher' Smith, and in the north-east, around Ringarooma and the Blue Tier, where tin was discovered in 1874. Geoffrey Blainey, an eminent historian, indicates that the discovery of tin in Tasmania 'blew away the depression and lifted Tasmania in the late 1870s into its most prosperous era of the century'.³ This importance is reflected in the large number of historical studies of Tasmanian tin mines, including books on Mount Bischoff and on the north-east tin mines and articles by historians Nic Haygarth and Greg Jackman.⁴

The tin ore from the Tasmanian mines was initially sold to Sydney for smelting to produce the tin metal. Smelting involved heating the ore with either coal or charcoal at about 1200°C in reverberatory furnaces, in order to reduce the tin dioxide in the ore to tin metal.⁵ This was relatively simple technology copied

1 *Mercury*, 11 July 1930, p. 7.

2 G Blainey, *The Rush That Never Ended: A History of Australian Mining* 4th edition (Melbourne, 1993), pp. 128 and 205.

3 Blainey, *The Rush That Never Ended*, p. 207.

4 N Haygarth, *Baron Bischoff: Philosopher Smith and the Birth of Tasmanian Mining* (Perth, Tasmania, 2004); J Beswick, *Brothers' Home: The Story of Derby, Tasmania* (Gravelly Beach, Tasmania, 2003); G Richardson, *Tin Mountain: The European and Chinese History of the Blue Tier, Poimena and Weldborough* (Hobart, 2013); N Haygarth, 'Tasmania's Mount Bischoff tin mine: Dolcoath of the Antipodes?', in P Claughton and C Mills, eds., *Mining Perspectives: Proceedings of the Eighth International Mining History Congress* (Truro, Cornwall, 2011), pp. 145–153; G Jackman, 'No Good is to be Found in the Granite': Aspects of the Social Maintenance of Mining Concepts on Blue Tier Tin-Field, Tasmania', *Australasian Historical Archaeology*, 13 (1995), pp. 49–58.

5 A description of the smelting process is given in Appendix 1.

from Cornwall. By January 1875 the Mount Bischoff Tin Mining Company was smelting its ore in its own smelter in Launceston.⁶ At least another four smelters were built in Tasmania in the period 1876–1901. The history of the Tasmanian tin smelters, which were an integral part of the tin business, has received little attention from historians, in contrast to the mines. Only one relevant article has been written. This is a brief history of the Mount Bischoff smelting works by Nic Haygarth.⁷

Australia-wide, there have been few articles on tin smelters and these cover both mining history and business history. An example of the former is the article on the Tolwong smelter in New South Wales, which operated very briefly in the early 1900s before closing, because of metallurgical difficulties in processing the complex ore.⁸ The article on John Moffatt—a mine owner and entrepreneur—who built a tin smelter at Herberton, Queensland in the 1890s, is an example of the latter.⁹ In this article the smelter is only part of the narrative, not the centre of it.

Why the dearth of historical studies of Australian tin smelters, compared with other non-ferrous metals? It is, I suggest, due to three factors. First, the tin smelters used relatively simple technology and Australia did not make any major advancement in the technology. Second, the tin smelters were few and small and they did not have a large economic impact, except in Tasmania. Third, tin is now a relatively minor metal in the Australian economy.

The tin smelters used reverberatory furnaces and these were unchanged in the period 1875–1901. The metallurgy was simple, the Tasmanian ores were relatively pure and the recovery of tin during smelting was typically greater than 98 per cent. Consequently there was no incentive for metallurgical improvements. The complex tin ores at Tolwong were insufficient to justify experimentation to improve the recovery and the smelter failed.¹⁰ In contrast Australian metallurgists

6 *Mercury*, 1 August 1879, p. 3.

7 N Haygarth, 'Mining Comes to Town: The Mount Bischoff Company Smelter and The Tin Trade', *Papers and Proceedings Launceston Historical Society*, vol. 18 (2006), pp. 49–61.

8 K McQueen, 'Difficulties with Refractory Ores: History of the Tolwong Mines, Shoalhaven Gorge, NSW', *Journal of Australasian Mining History*, vol. 1 (2001), pp. 110–120.

9 R Kerr, 'Irvinebank, Mining Community and the Centre of an Empire: "God Bless John Moffatt"', *Brisbane History Group Papers*, vol. 12, no.1, 1984, pp. 141–164.

10 McQueen, 'Difficulties with Refractory Ore', pp. 110–120.

made significant advancements in the smelting and recovery of both gold and copper, which were more valuable than tin. These technical innovations have been documented by Robert Birrell.¹¹ They include the development of pyritic smelting at Mount Lyell by Robert Sticht and the treatment of complex gold ores at Kalgoorlie.¹²

Only in Tasmania was tin a significant part of the economy, whereas elsewhere, except in a few local areas, tin was only a minor part of the economy. This lack of importance is highlighted by the biography of Thomas Mort, who was a leading businessman and entrepreneur in New South Wales in the nineteenth century. He co-owned the Pymont Tin Smelting and Refining Company in Sydney.¹³ However, his biography fails to mention this.¹⁴ The importance of tin in the Tasmanian economy in the later part of the nineteenth century is similar to that of copper in South Australia in the 1840s, which has been extensively studied by historians. For example, historians Jennifer Carter and Roger Cross have described the early smelters that were established to smelt the copper ore from the Burra copper mine.¹⁵ They indicate that these smelters failed for a number of reasons, including inadequate capitalisation, technical difficulties and loss of workers to the Victorian gold-fields in 1852.¹⁶ Mel Davies, an economic and mining historian, has examined the economics behind the decision of the Patent Copper Company to build its smelter at Burra when this involved the transport of large tonnages of coal to the smelter from Newcastle.¹⁷

Tin is now a relatively unimportant metal in the Australian context. In 2012 only 5,800 tonnes of tin-in-concentrate were produced, which was valued at \$110

11 R Birrell, 'The Development of Mining Technology in Australia 1801–1945', unpublished PhD Thesis, University of Melbourne, 2005, pp. 165–192.

12 G Blainey, *The Peaks of Lyell* 3rd edition (Melbourne, 1967); R Hartley, 'Western Australia Gold Smelter in the 1900s', *Journal of Australasian Mining History*, vol. 1 (2003), pp. 169–178.

13 *Sydney Morning Herald*, 4 February 1874, p. 7.

14 A Barnard, *Visions and Profits: Studies in the Business Career of Thomas Sutcliffe Mort* (Melbourne, 1961).

15 J Carter and R Cross, 'Success and Failure: Earliest Attempts at the Commercial Smelting of the 'Monster Mine's' Copper Ore in the Province of South Australia', *Journal of the Historical Society of South Australia*, no. 25 (1997), pp. 18–34.

16 Carter and Cross, 'Success and Failure', pp. 24 and 32.

17 M Davies, 'Taking Coals from Newcastle – Smelting Location and Fuel Costs at Koorunga, South Australia', *Journal of Australasian Mining History*, vol. 3 (2005), pp. 34–57.

million and production of tin ceased in 2007 when the Greenbushes smelter in Western Australia closed.¹⁸ Hence tin is unlikely to capture the imagination of historians, compared with other metals such as copper and gold.

The article by Nic Haygarth on the Mount Bischoff smelting works in Launceston provides brief information on three other Tasmanian tin smelters that operated in the 1870s and 1880s. In 1876, the Stanhope Company built a smelter at Waratah, which operated for about two years.¹⁹ A year later the Hobart Town Tin Smelting Company began to smelt tin ore, but after intermittent operations closed in 1885. In 1878 the Tasmanian Tin Smelting Company started in Launceston, but it closed in 1887.²⁰ Haygarth indicates that the Hobart Town Tin Smelting Company was formed to treat ore from the six north-east tin mines that were registered in Hobart and that it failed due to mismanagement. Haygarth provides no information on the reasons for the establishment and closure of the smelters owned by the Stanhope Company and Tasmanian Tin Smelting Company. Lindy Scripps, a Tasmanian historian, in the *Industrial Heritage of Hobart* agrees with Haygarth that the Hobart Town Tin Smelting Company was formed to capitalise on the tin ore from the mines in north-eastern Tasmania, but disagrees on the reasons for the company's failure.²¹ She states that the company failed through lack of support from the mining companies. This thesis will argue that both are correct. The Hobart smelter closed temporarily on at least two occasions; once due to mismanagement and once due to the lack of support by the tin miners. This thesis suggests that it closed finally when the Mount Heemskirk tin-field failed to live up to expectations.

In 1900 a smelter was built in St Helens by the Anchor Tin Mine Company, but it only operated for about six months.²² It closed, according to the *Report of the Secretary for Mines for 1901–1902*, because of a lack of tin ore.²³

This thesis redresses the lack of historical studies on the four Tasmanian tin

18 Australian atlas of mineral resources, mines and processing centres website at <http://www.australianminesatlas.gov.au/aimr/commodity/tin.html> accessed on 11 August 2014.

19 Haygarth, 'Mining Comes to Town', p. 53.

20 Haygarth, 'Mining Comes to Town', p. 54 and footnote 40 on p. 60.

21 L Scripps, *Industrial Heritage of Hobart* (Hobart, 1997), p. 102.

22 *Examiner*, 10 October 1900, p. 5; *Examiner*, 29 April 1901, p. 4.

23 *Report of the Secretary for Mines for 1901–1902* (Hobart, 1902), p. xxv.

smelters that competed with the Mount Bischoff smelting works. It investigates the reasons for building these four smelters and the reasons why they failed. It is primarily a mining history, as it is focussed on the smelters and less on the social and political framework in which they operated. The major primary sources used herein are the Tasmanian newspapers for the period 1874–1901. The Tasmanian Archive and Heritage Office has a file on the Hobart Town Tin Smelting Company, but this only contains the Articles of Association of the company and lists of shareholders.²⁴ The Archive Office has no information on the other smelters, which is not surprising as they were owned by non-Tasmanian companies.²⁵ The thesis focuses on the Hobart smelter, because this was the only Tasmanian-owned company and therefore its activities were more extensively reported in the newspapers. It also had the most interesting history and its establishment and failure were due to both internal and external factors.

This thesis has three chapters. The first chapter presents background information on the development of tin mining in Tasmania and on the establishment of the Mount Bischoff smelter. This chapter then documents the establishment of the other four smelters, including why they were established and the technology used. For the Hobart smelter it is suggested that Hobart–Launceston rivalry was a key factor in its establishment. The reasons for the failure of these smelters are evaluated in Chapters 2 and 3. Chapter 2 assesses internal factors, which were within the control of the smelter, including the competency of both the management and the technical staff. Chapter 3 assesses external factors, which were beyond the control of the smelter, such as the price of tin, the suitability of the technology and the availability of the ore. In Chapters 2 and 3 the performance of the four failed smelters is contrasted to that of other Australian smelters and shows that the failure of the tin smelters was not unique to Tasmania, but common across Australia.

In this thesis the measurements and monetary values are as presented in the primary sources for the period 1874–1901.

24 Tasmanian Archive and Heritage Office (hereafter TAHO) SC 323/1/23 – Company No. 41 The Hobart Town Tin Smelting Company.

25 TAHO NS1012/1/3 to NS1012/1/11 have information on the Anchor tin mine when it was a Tasmanian company, but it was sold to an English syndicate in 1895.

CHAPTER 1 – ESTABLISHMENT OF THE TASMANIAN TIN SMELTERS

Background

Since the 1870s mining has been important to Tasmania. In 1871 tin was discovered at Mount Bischoff. This was followed by the discovery of the Beaconsfield goldfield in 1877, silver-lead at Zeehan in 1882, copper-gold at Mt Lyell also in 1882 and zinc-lead at Rosebery in 1890.¹ All of the towns on the west coast of Tasmania and a number in the north-east resulted from the mining boom, which benefited Launceston more than Hobart.² As a result Launceston challenged Hobart for economic supremacy.

James 'Philosopher' Smith's discovery of tin at Mount Bischoff encouraged others to look for tin and in 1874 George Renison Bell discovered tin at a number of locations in the north-east of Tasmania, including Derby, Ringarooma and Thomas Plains.³ In the same year Samuel Harrison, a policeman, discovered tin at Georges Bay and on the Blue Tier plateau.⁴

The discovery of tin, together with a rise in the wool price, boosted business confidence, which had suffered when Tasmania entered a prolonged economic recession after the attainment of self-government in 1856.⁵ After 1872 the Tasmanian economy started to improve with steady increases in trade figures and agricultural production.⁶ The discovery of tin, however, did not have a direct impact on the Tasmanian economy for a number of years. In 1874 the value of tin exports was only £7,318, increasing to £31,325 in 1875, £99,605 in 1876 and

1 G Dickens, 'Mining' in A Alexander, ed., *The Companion to Tasmanian History* (Hobart, 2005), pp. 238–9; A Webster, 'Mount Lyell' in A Alexander, ed., *The Companion to Tasmanian History*, p. 243.

2 G Linge, *Industrial Awakening: A Geography of Australian Manufacturing 1788 to 1890* (Canberra, 1979), pp. 42, 642, 662–3.

3 J Beswick, *Brothers' Home: The Story of Derby, Tasmania* (Launceston, 2003), pp. 7–8; Thomas Plains or Thomas' Plains is now called Weldborough.

4 A Macintosh Reid and Q Henderson, 'Blue Tier Tin Field', *Geological Survey Bulletin No 38* (Department of Mines, Hobart, 1928), p. 6; A Lesser, *Mine, Men and Misfortune: A History of the Anchor Mine and Local Community* (St Helens, 1987), p. 7.

5 B Meikle, 'Hard Times in the Golden Age: The Long Depression of Tasmania, 1857–1875', *Tasmanian Historical Studies*, vol. 15 (2010), pp. 39 and 59.

6 W Townsley, 'Tasmania and the great economic depression, 1858–1872', *Papers and Proceedings* (Tasmanian Historical Research Association), vol. 4 (1960), p. 46.

£296,941 in 1877.⁷ It then remained relatively constant between £300,000 and £400,000 for the next decade when the value of tin exports was approximately 20 per cent of the total exports from Tasmania.⁸

The discovery of tin generated a considerable amount of interest in the business communities of Hobart and Launceston, and a number of tin mining companies were floated. One of the first to be floated, and the most successful, was the Mount Bischoff Tin Mining Company. It was floated in August 1873 and benefited from the improving business confidence, as all of the 7,600 shares available to the public were quickly sold and another 2,000 shares could have been sold.⁹ Five tin smelters were built in the period 1874–1900 to convert the tin in the ore into tin metal: two were in Launceston, one in Hobart, one in St Helens and one in Waratah. This chapter assesses the reasons for building these smelters.

Mount Bischoff Smelter

The Mount Bischoff Company, which had its office in Launceston, produced only four tons of tin ore for export in 1873. The following year 142 tons of tin ore were produced, which included 68 tons of ore that were sent to Sydney for smelting.¹⁰ The smelting was done at the Pymont Tin Smelting Company, where Thomas Carpenter was the smelting manager. It was not successful and the directors of the Mount Bischoff Company decided to erect their own furnaces, as they realised that to continue to export ore 'would have led to serious loss'.¹¹ Accordingly, the company built a smelter in Launceston with construction of the two furnaces starting in October 1874. Smelting commenced in January 1875 with William Jenkin, who was hired by James Smith, from Sydney as the smelting manager and assayer. Jenkin advised that the first smelting was 'most successful' and that the tin produced was of the 'very best quality'.¹² In its first year of operation the smelter smelted all the ore produced in Tasmania.¹³ About half the

7 R Johnston, *Systematic Account of the Geology of Tasmania* (Hobart, 1888), p. 31.

8 Meikle, 'Hard Times in the Golden Age', p. 61; Johnston, *Geology of Tasmania*, p. 31.

9 *Cornwall Chronicle*, 5 September 1873, p. 3.

10 *Mercury*, 1 August 1879, p. 3.

11 *Mercury*, 1 August 1879, p. 3.

12 *Launceston Examiner*, 5 January 1875, p. 2.

13 Johnston, *Geology of Tasmania*, p. 31; In toll smelting the mining company paid the smelter a

ore came from the Mount Bischoff mine and the rest came from the mines in north-east Tasmania and the Stanhope mine in Waratah.¹⁴

The Mount Bischoff smelter was established only two years after the first tin smelter in Australia was built at Bulimba, near Brisbane.¹⁵ This started in December 1872 to smelt the tin ore from the Stanthorpe tin-field in Queensland. Other smelters quickly followed so that by February 1876 there were at least fourteen smelters operating in Australia: six in Sydney, two in Newcastle, one in El Dorado, Victoria, two in Stanthorpe, one in Tent Hill, New South Wales and two in Tasmania.¹⁶ The two Tasmanian smelters at this time were the Mount Bischoff smelter in Launceston and a smelter in Waratah, owned by the Stanhope Tin Mining Company.

Stanhope Smelter

The Stanhope Tin Mining Company, which was registered in Melbourne, owned a claim adjacent to the Mount Bischoff claim.¹⁷ It initially smelted its ore at the Mount Bischoff smelter, but in May 1875 decided to build its own smelter in Waratah using local wood rather than imported coal.¹⁸ This decision was prompted by the high cost of smelting in Launceston of £6 per ton of ore. With a saving in cartage of coal and ore, the company expected to save £8 to £10 per ton of ore smelted.¹⁹ The company's decision followed the recommendation of George Ulrich, the Government Geologist of Victoria, who had previously advised the Mount Bischoff Company to build its smelter in Waratah and to use wood, based on the tin smelter at El Dorado. The Mount Bischoff Company, however, rejected Ulrich's advice opting, instead, to build its smelter in Launceston.²⁰ The *Launceston Examiner* attacked the Stanhope Company's decision pointing out that

toll to smelt its ore and received back the tin metal produced from their ore.

14 *Launceston Examiner*, 7 August 1875, p. 2; *Launceston Examiner*, 15 January 1876, p. 5.

15 Linge, *Industrial Awakening*, p. 672.

16 *Launceston Examiner*, 17 February 1876, p. 2.

17 *Cornwall Chronicle*, 16 April 1875, p. 4.

18 *Mercury*, 15 May 1875, p. 2. The wood was used as fuel to heat the furnace and also was converted into charcoal, which was added to the furnace with the ore as a flux.

19 *Mercury*, 18 June 1875, p. 2.

20 N Haygarth, 'Mining Comes to Town: The Mount Bischoff Company Smelter and The Tin Trade', *Papers and Proceedings Launceston Historical Society*, vol. 18 (2006), pp. 50–51.

the El Dorado smelter only smelted two to three tons of tin ore per week and that Ulrich was a geologist and metallurgist with no practical experience of smelting.²¹ The newspaper was, perhaps, defending both the decision of the Mount Bischoff Company to reject Ulrich's advice and the company's smelting monopoly.

The Stanhope smelter had one reverberatory furnace and this had two firing places instead of the usual one, because of the use of wood as the fuel. John Goodall, who was managing director of the Stanhope Company, declared that myrtle was 'the finest firewood that he had ever seen'.²² The furnace was built for £250 by Nicol Turner, who came from the El Dorado smelter.²³ He used local materials, such as basalt rock for the outside of the furnace, to save cost. Turner stayed on as the smelter-man and was joined by a Mr Scott, who also came from the El Dorado smelter.²⁴ The Stanhope smelter produced its first tin in January 1876, which the *Mercury* applauded as the use of wood had been ridiculed and a speedy failure prophesied.²⁵ The *Mercury* commented that the successful smelting 'shows what can be achieved by acting instead of talking'. The company's directors advised that the cost of smelting was only 37 shillings per ton. A correspondent to the *Launceston Examiner*, however, claimed that the smelter was working at only about a quarter of its capacity and had produced a mere 18 tons of tin in thirty-six days.²⁶ He also inferred that the tin was of inferior quality to that produced by the Mount Bischoff smelter. The correspondent appeared to be defending the Mount Bischoff smelter's monopoly by attacking a competitor. In general the *Mercury* supported the Stanhope Company, while the *Launceston Examiner* was critical. The Stanhope Company built a second furnace, which started in September 1876, so that by December 1876 the smelter had almost doubled its capacity to 40 tons of tin per month.²⁷ However, within three years it had closed.²⁸

21 *Launceston Examiner*, 22 June 1875, p. 2.

22 *Mercury*, 13 August 1875, p. 3.

23 *Mercury*, 15 May 1875, p. 2; *Mercury*, 29 August 1876, p. 3.

24 *Mercury*, 2 February 1876, p. 2.

25 *Mercury*, 28 January 1876, p. 2.

26 'Blow Hard', 'Tin Smelting at Mount Bischoff. Advice to Miners—Be Not Deceived!', *Launceston Examiner*, 9 March 1876, p. 3.

27 *Mercury*, 15 December 1876, p. 2.

28 'Australian Tin Miner', 'Smelting Tin', *Mercury*, 18 August 1879, p. 3.

Proposed North-east Tasmanian Smelters

The tin mines in north-east Tasmania transported their ore from the mines to the ports of Boobyalla, Bridport or Georges Bay, over very poor roads and the cost of transport was a major impediment.²⁹ Hence they probably looked keenly at the smelter built by the Stanhope Company as a means of reducing their costs. In the period November 1875 to January 1877 there were at least four proposals to establish smelters in north-east Tasmania. In all cases nothing eventuated.

First, in November 1875 the *Launceston Examiner* reported that a project had been initiated to establish tin smelting furnaces at Mt Cameron, at Upper Ringarooma and at Georges Bay.³⁰ Second, Edward Crowther, a Hobart medical doctor and mining speculator, advertised in June 1876, on behalf of the Marie Louise Tin Mining Company, for a cost estimate to erect two or more furnaces at its mine located twenty-five kilometres from Georges Bay.³¹ Third, in December 1876 Tye Sing, a Chinese merchant in Melbourne, and Ah Moy, a tin smelter-man from Beechworth, Victoria visited Ringarooma with a plan to establish a smelting furnace.³² They selected a site for the erection of a furnace, but did not proceed, apparently because they could not resolve whether to use wood or coal for smelting.³³ Fourth, in January 1877 a prospectus was issued by Henry Rooke, a Launceston merchant and importer, for the Ringarooma Tin Ore Purchasing and Smelting Company Limited with a nominal capital of £8,000 in 2,000 shares of £4 each.³⁴ The company proposed to purchase tin ore and smelt it at two central sites in the Ringarooma district, which it was claimed would save in cartage and freight and the loss of tin ore from bags during transport. The company advised that it could also secure the services of both a smelting manager with a significant experience in tin smelting and a first-class assayer. However, according to the *Cornwall Chronicle*, there was a division in the company, so that nothing

29 G Roberts, *Metal Mining in Tasmania 1804 to 1914: How Government helped shaped the mining industry* (Launceston, 2007), p. 292.

30 *Launceston Examiner*, 30 November 1875, p. 3

31 *Mercury*, 16 June 1876, p. 1.

32 *Cornwall Chronicle*, 1 January 1877, p. 2.

33 *Mercury*, 13 March 1877, p. 2.

34 *Mercury*, 10 January 1877, p. 3

eventuated.³⁵

Hobart Tin Smelter

In the first half of 1876 all the tin mining activities in Tasmania were in the northern half of the colony. Eleven of the tin mining companies had their headquarters in Launceston, compared with only six companies with headquarters in Hobart.³⁶ Hobart's only direct involvement in tin mining was when ore bound for Launceston or Sydney was shipped through its port.³⁷ In 1876, 431 tons of ore were exported from Hobart.³⁸ Hobart businessmen would have seen this as a lost opportunity, as the benefits from tin mining were being realised elsewhere. The production of tin ore quadrupled between 1875 and 1876 from 490 tons to 1,972 tons, which provided the incentive to establish a tin smelter in Hobart.³⁹ The discovery of alluvial tin on the west coast in April 1876 by the District Surveyor, Charles Sprent, provided a further incentive.⁴⁰

On 6 June 1876 a meeting was held in Hobart to discuss the establishment of a tin smelter in either Hobart or north-east Tasmania.⁴¹ There was widespread interest as twenty-four people attended including: Sir James Wilson, the member for Hobart in the Legislative Council; John Perkins, the Mayor of Hobart, and James Bayley, William Hammond, Alexander McGregor and Alexander Webster, some of Hobart's leading businessmen. Sir James, who was elected chairman of the meeting, expressed the view that the proposed smelter should be in Hobart, which would bring a 'large amount of trade to the capital'. He envisaged that the tin ore would come to Hobart from Georges Bay and Ringarooma by steam ship operated by the Tasmanian Steam Navigation Company. Macquarie Harbour was also foreshadowed as a potential source. He acknowledged that there would be

35 *Cornwall Chronicle*, 11 April 1877, p. 2.

36 *Walch's Tasmanian Almanac 1877* (Hobart, 1878), p. 159.

37 *Launceston Examiner*, 6 May 1876, p. 5; *Mercury*, 7 August 1876, p. 3.

38 *Statistics of the Colony of Tasmania for the year 1876* (Hobart, 1877), pp. 53 and 74. In 1876 113 tons of ore were exported from Launceston.

39 *Statistics of the Colony of Tasmania for the year 1875* (Hobart, 1876), p. 91; *Statistics of the Colony of Tasmania for the year 1876*, p. 90; *Mercury*, 14 April 1877, p. 1S.

40 L. Whitham, *Railways, Mines, Pubs and People and other historical research* (Sandy Bay, 2002), p. 47; Haygarth, 'Mining Comes to Town', p. 53.

41 *Mercury*, 7 June 1876, p. 2. The article includes a list of the attendees at the inaugural meeting.

rivalry with Launceston, but optimistically said that 'there was ample room for both'. William Hammond had a contrary view and thought that the smelter should be at Georges Bay, close to the mines, and indicated that he had heard that some mines at Weldborough and Georges Bay were planning to erect small furnaces for smelting their ore. The meeting could not agree on the location for the proposed smelter and appointed a committee to investigate the merits of Hobart, Georges Bay and Ringarooma.

A party of Hobart gentlemen, which included John Perkins, inspected the Mount Bischoff smelter on 16 June 1876 and were 'much pleased with what they saw'.⁴² They were in Launceston for the official opening, by the Governor of Tasmania, of the works of the British and Tasmanian Charcoal Iron Company the following day.⁴³

The Sydney metal brokers, who purchased Tasmanian tin ores for the Sydney smelters, responded to the threat of increased competition for the ores from a new smelter by increased advertising in the Tasmanian newspapers. For example, the Sydney metal brokers, Hardie and Gorman, advertised to buy tin ore on 'specially favourable terms', while a similar firm, Henry Beit and Co, advertised that 'account sales will be promptly rendered'.⁴⁴ The advantages of selling tin ore to the Sydney smelters were highlighted in a letter by W Tulloh, a tin buyer from Sydney.⁴⁵ These included the seller receiving an additional £2 per ton. While welcoming the competition from the Sydney smelters as 'competition prevents imposition', the *Launceston Examiner* cautioned that the advantage to Sydney may be short-lived as the large smelters in Sydney had lowered the charge for smelting from 50 shilling to 30 shillings per ton, in order to drive out the smaller smelters and thus obtain a monopoly after which prices would increase.⁴⁶

The proposal to establish a smelter in either Hobart or Georges Bay was attacked in a letter to the *Launceston Examiner* as being driven by politicians, who had either a vested interest in the tin mines about the Blue Tier, Georges Bay

⁴² *Mercury*, 17 June 1876, p. 2.

⁴³ *Mercury*, 20 June 1876, p. 3.

⁴⁴ *Launceston Examiner*, 24 August 1876, p. 1; *Mercury*, 24 August 1876, p. 1.

⁴⁵ W Tulloh, 'Tin and Tin Ore', *Launceston Examiner*, 31 August 1876, p. 3.

⁴⁶ *Launceston Examiner*, 26 August 1876, p. 2.

and Goulds Country or shares in the Tasmanian Steam Navigation Company.⁴⁷ The attack was based on the lack of action by the government to build a road over the Blue Tier and to provide jetty facilities at Georges Bay. These were a continuing grievance for the miners on the north-east coast of Tasmania.⁴⁸ In a more conciliatory tone a correspondent from Georges Bay advised that the miners of Georges Bay 'would gladly deal with the South, but no effort is being made to retain their custom by assisting them to obtain a passable road from the Blue Tier and Gould's Country to George's Bay and by providing them with smelting facilities'.⁴⁹ In evidence of the poor conditions for shipping at Georges Bay the vessel *St Helens* had to jettison 7½ tons of tin ore when it struck the bar at the entrance to the harbour.⁵⁰

After the initial meeting in June 1876 enthusiasm for the proposed smelter appeared to wane, as there was no progress for more than six months. In the interim the *Mercury*, in August 1876, deplored the lack of progress.⁵¹ Hobart Town, it suggested, was the 'natural receptacle of the tin products of the East Coast, the natural mart from which to draw supplies of the miners, whose wages are paid from Hobart Town capital'. The people of Hobart, however, it considered by 'their sheer sleepiness' had let nearly all the Georges Bay trade slip through their fingers to the benefit of Launceston. The *Mercury* believed that a smelter would be profitable, irrespective of where it was built. In Hobart, labour would be more plentiful and the smelter would be under the eye of the shareholders, while at Georges Bay cartage costs would be 25 to 30 per cent less and the tin could be shipped directly to market, thus saving double freight. Finally, it asked is there 'sufficient spirit in Hobart Town to set agoing so promising an undertaking?' The *Mercury* was apparently trying to provoke Hobart-Launceston rivalry, by inferring that as Launceston had a tin smelter then Hobart should have one too.

In December 1876, six months after the initial meeting, an advertisement in the *Mercury* advised that it was proposed to form a company to build a smelter in

47 'Janus', 'Consistency – What Does it Mean?', *Launceston Examiner*, 13 June 1876, p. 3.

48 *Mercury*, 11 August 1876, p. 2.

49 *Mercury*, 21 August 1876, p. 3.

50 *Launceston Examiner*, 21 July 1877, p. 5.

51 *Mercury*, 11 August 1876, p. 2.

Hobart.⁵² The company was to have a capital of £10,000, comprising 1,000 shares each of £10, but to call up only £2 10s per share, which it indicated would be more than sufficient to fund the estimated cost of £1,500 for the erection of a smelter to treat 50 tons of tin ore per week. The company had also obtained the services of a gentleman with significant experience in the reduction of tin ores in Cornwall and New South Wales. In support of the proposal Hardie and Gorman, Sydney metal brokers, reported that all the smelters in Sydney were fully employed and would be for some time.⁵³ The *Mercury* thought this should be splendid encouragement to the promoters of the smelter and persuade the public to take up shares.

A private meeting of gentlemen interested in the formation of the proposed company was held in January 1877 and £1,000 subscribed.⁵⁴ The prospectus of the Hobart Town Tin Smelting Company (Limited) was finally issued on 25 January 1877.⁵⁵ The capital of the company was to be £5,000 in 500 shares of £10 each, with an initial call up of £4 per share, payable in four equal instalments over six months. The prospectus advised that a site in Gladstone Street (then George Street), near the New Wharf, had been secured at a modest rental of £40 per annum with the option to purchase for £600 and that a large number of shares had already been taken up by the directors. The provisional directors were James Lord, the member for Pembroke in the Legislative Council, William Hammond, Philip McArdell, Thomas Giblin and Henry Marsh, with Richard Butler as the company solicitor and John Cole as the company secretary. Applications for the shares closed five days later on 30 January 1877. The shares, however, attracted limited interest and the *Mercury* expressed regret that the application for shares was not as numerous as expected.⁵⁶ The reason for this, it believed, was apathy as they anticipated that with the flourishing state of the tin market that there would be no difficulty in forming the company. The limited interest contrasts with the float of the Mount Bischoff Tin Mining Company, where all the shares were

⁵² *Mercury*, 28 December 1876, p. 3.

⁵³ *Mercury*, 30 December 1876, p. 2.

⁵⁴ *Mercury*, 10 January 1877, p. 2.

⁵⁵ *Mercury*, 25 January 1877, p. 1.

⁵⁶ *Mercury*, 29 January 1877, p. 2.

subscribed in two days.⁵⁷ The provisional directors may have anticipated the poor response for the shares, because the company's capital was reduced from £10,000 in the original proposal of the previous month and the call up of funds was reduced from £2,500 to £2,000.

The inaugural meeting of the Hobart Town Tin Smelting Company was held on 30 January 1877 at the offices of Alfred Butler, a lawyer and investor, in Collins Street, Hobart.⁵⁸ Only twelve people attended the meeting and only 366 out of 500 shares had been taken up. A total of nearly £1,500 had been raised, which was sufficient to cover the estimated cost of £750 for building two furnaces, a chimney, an office and a shed, according to the newly appointed smelting manager, Thomas Carpenter. The provisional directors were confirmed as directors of the company, with the addition of Richard Crosby.

The Articles of Association of the Company were signed on 4 April 1877.⁵⁹ It listed the directors of the company as William Hammond, Richard Crosby, Edward Crowther, Alexander Ireland, Henry Marsh and Philip McArdell. In the three months since the inaugural meeting Thomas Giblin and James Lord had left the board of directors and been replaced by Edward Crowther and Alexander Ireland. Their departure was, perhaps surprising, as James Lord was a large shareholder in the company owning 5 per cent of the shares and Thomas Giblin was a speculator in mining companies, being the chairman of the Ruby Extended Tin Mining Company.⁶⁰

The board of directors was made up of experienced businessmen and speculators. William Hammond, who was the company's chairman, was a partner in the firm Huybers and Hammond, general merchants and importers.⁶¹ He was also interested in mining and was the chairman or a director of a number of mining companies, including the Cumberland Tin Mining Company and the Blue Tier Tin Mining Company.⁶² Richard Crosby and Henry Marsh were both

⁵⁷ *Cornwall Chronicle*, 5 September 1873, p. 3

⁵⁸ *Mercury*, 31 January, 1877, p. 2.

⁵⁹ Tasmanian Archive and Heritage Office (TAHO) SC323/1/23, Articles of Association p. 11.

⁶⁰ *Mercury*, 28 July 1876, p. 3.

⁶¹ *Mercury*, 19 July 1880, p. 3.

⁶² *Mercury*, 28 July 1880, p. 3; *Mercury*, 24 July 1880, p. 2.

businessmen: Crosby was a merchant, while Marsh operated an ironmongery.⁶³ The other directors, Edward Crowther, Philip McArdell and Alexander Ireland were speculators.⁶⁴ Ireland was also the headmaster of the Collegiate School in Davey Street, Hobart. The paid officers were Richard Butler as the company's solicitor and John Cole as the general manager. However, Cole was in this position for only six months, before being replaced by Richard Butler.⁶⁵ Henry Marsh resigned as a director in April 1877 and was replaced by John Perkins, who was also a businessman in Hobart.⁶⁶ When Perkins left Tasmania for England in March 1878 he was replaced by Charles Knight, who was a fruiterer and the company's major shareholder with 26 per cent of the shares.⁶⁷ Perkins rejoined the board when Edward Crowther resigned in August 1878.⁶⁸

No register has been found of the original shareholders, but a register of the shareholders in 1878 exists.⁶⁹ All of the forty shareholders lived in Hobart, except for James Lord who resided in New Town. Hence the company was solely a Hobart establishment and had no shareholder support in Launceston, where most of the tin mining companies had their headquarters. In contrast the Mount Bischoff Company had shareholders across Tasmania. Surprisingly, some of the businessmen, such as James Bayley, Alexander McGregor and Alexander Webster, who attended the initial meeting in June 1876, did not become shareholders, perhaps having a premonition of the troubles ahead for the company.

One resident of Hobart, while supporting the proposed smelter, expressed concern at the proposed location near the New Wharf as 'fumes from smelting process are well known to be deleterious to health'.⁷⁰ The resident requested that Dr Edward Hall, as protector of the health of the city, provide an opinion. Dr Hall apparently did not respond, as no response has been found in the *Mercury*. A correspondent to the *Mercury* advised, in a rebuttal, that 'no fumes of a noxious

63 Occupations of Crosby and Marsh are from the company's shareholder register in TAHO SC323/1/23.

64 *Mercury*, 16 June 1876, p. 1; *Mercury*, 22 August 1907, p. 6; *Mercury*, 12 July 1877, p. 3.

65 *Mercury*, 31 August 1877, p. 3.

66 *Mercury*, 31 August 1877, p. 3.

67 'The Trifler', *Tasmanian Mail*, 16 March 1878, p. 13; TAHO SC323/1/23.

68 *Mercury*, 31 August 1878, p. 3.

69 TAHO SC323/1/23 and Table 1 in Appendix 2.

70 'R', 'Smelting Works', *Mercury*, 29 January 1877, p. 2.

character are produced in the process of tin smelting'.⁷¹ The correspondent cited examples in Launceston and Sydney, where tin smelters were located in populated areas, and with respect to the Mount Bischoff smelter indicated that there were no complaints by the residents in adjacent houses. The correspondent further advised that if smelters were harmful health officials would have taken steps to remove them to less populated areas.

The location of the smelter in Gladstone Street, near the New Wharf, was not the company's original preference. It had tried to obtain a twenty-one year lease on a site on the Domain adjoining the Cattle Jetty for its operations.⁷² To this end a delegation of Hammond, McArdell and Cole visited the Minister of Lands and Works, Christopher O'Reilly. The Minister indicated that a long term lease was not possible, but a year to year lease, similar to those held by the Bathing Company and the Derwent Rowing Club, was possible. He advised that, while supportive, the proposed lease had to be submitted to his parliamentary colleagues. However, when the matter was subsequently raised in Parliament, the Minister denied any intention to alienate a portion of the Domain.⁷³

In contrast to the slow start in forming the company, once formed it moved quickly to establish the smelter. In February 1877 construction started on the furnaces, chimney, office and shed, under the supervision of Thomas Carpenter.⁷⁴ The following month further tenders were advertised for the erection of a fence and gates and for the supply and installation of flagging stone.⁷⁵ Construction progressed and by the end of March 1877 the chimney was almost complete, as well as one furnace, with the other furnace expected to be finished in another three weeks.⁷⁶ The chimney was 70 feet high and 7 feet square at the base and 5 feet square at the top.⁷⁷ The area occupied by the furnaces and chimney was 60 feet by 50 feet and there was room for the installation of more furnaces. A substantial

71 'X.Y.Z.', 'The Tin Smelting Works', *Mercury*, 30 January 1877, p. 3.

72 *Mercury*, 18 January 1877, p. 2.

73 *Mercury*, 23 January 1877, p. 3.

74 *Mercury*, 10 February 1877, p. 2.

75 *Mercury*, 17 March 1877, p. 3.

76 *Mercury*, 23 March 1877, p. 2.

77 *Mercury*, 5 June 1877, p. 3.

wooden building 25 feet high with gable ends covered the furnaces.⁷⁸ The smelter was erected on land leased from Charles Knight and was at the rear of the stores of Messrs W. Knight and Co.⁷⁹

In readiness for starting, coal from Bulli arrived at the Argyle Street pier, Hobart, in April 1877.⁸⁰ Coal was used for both reducing the tin ore and for heating and approximately one ton of coal was required per ton of tin ore smelted. At the end of May 1877 four practical smelter-men arrived from Sydney and commissioning of the furnaces started, as the *Mercury* reported smoke issuing from the chimney.⁸¹ The furnaces were tested with two tons of slag, from the old iron works on the Castray Esplanade, which was successfully smelted to the state of bottle glass in about three hours.⁸² One of the smelter-men appears to have only stayed a short time, as a later report indicates that the smelter employed three skilled workmen from Sydney, two of whom had worked before with Thomas Carpenter, and six labourers. Carpenter, as the smelting manager, was paid a salary of £10 per week, while the labourers were each paid 30 shillings per week.⁸³

The production of tin began on 4 June 1877, when the furnaces were charged with two tons of tin ore, which was reduced to tin metal in eight hours.⁸⁴ Carpenter optimistically stated that 'when the furnaces are in full working order there will be none in the colonies equal to them'. The *Mercury* predicted that once established and profitable the Hobart Town Tin Smelting Company 'will become one of our most valuable industries'. To celebrate the event Sir James Wilson, William Hammond, Edward Crowther, Philip McArdell and Mrs McArdell and several others visited the smelter and a case of champagne, provided by Mrs McArdell, was opened. The company sent its first shipment of tin (55 tons) to Melbourne on the *SS Tamar* in July 1877.⁸⁵ The *Mercury* declared that now there

78 *Mercury*, 5 June 1877, p. 2.

79 *Mercury*, 5 June 1877, p. 2.

80 *Mercury*, 2 April 1877, p. 2.

81 *Mercury*, 28 May 1877, p. 2.

82 *Mercury*, 5 June 1877, p. 2.

83 J Webber, 'The Tin Smelting Works', *Mercury*, 18 April 1878, p. 3; *Mercury*, 11 November, 1878, p. 1.

84 *Mercury*, 5 June 1877, p. 2.

85 *Mercury*, 5 July 1877, p. 2.

was no reason why any Tasmanian ore should be sent to Sydney, as it could be smelted in Tasmania as cheaply.⁸⁶ However, this was optimistic because large quantities of tin ore continued to be exported for another year and only stopped after the Tasmanian Tin Smelting Company in Launceston started.⁸⁷ The smelter was, however, not a success and after a number of temporary closures, it closed permanently in October 1885.⁸⁸

Tasmanian Tin Smelting Company

In March 1878 Launceston had its second tin smelter when the Tasmanian Tin Smelting Company commenced smelting.⁸⁹ The smelter was owned by Andrew Low and Thomas Kelly of Sydney, who were also co-owners of the Australian Tin Smelting Works in Pyrmont, as well as other business interests.⁹⁰ Hence this smelter was built by entrepreneurs, whereas all the other Tasmanian smelters were built by companies. It appears that the ownership of the smelter was only divulged after smelting had commenced, as newspaper reports before then referred to it as being owned by either the Associated Smelters, Sydney or the Sydney Associated Smelting Works.⁹¹

The smelter, which was located between William Street and the Wharf Esplanade in Launceston, had two reverberatory furnaces, similar to those at the Mount Bischoff smelter and a 71 foot high chimney stack.⁹² These were built by W Orchard and each furnace had a capacity of 2½ tons of ore. Messrs Gardner and McKenzie were the business managers for the owners, while H Burns was the smelting manager. The smelter superintendent and assayer was George Latta, who was only nineteen years old.⁹³ He had learnt the craft of smelting from his father, who was the manager of the Pyrmont Works. Four skilled workmen for the

86 *Mercury*, 16 July 1877, p. 2.

87 Tables 2 and 3 in Appendix 3.

88 *Mercury*, 12 October 1885, p. 4.

89 *Mercury*, 11 March 1878, p. 2.

90 *Sydney Morning Herald*, 25 November 1878, p. 1; C Humphreys, 'A.S.Low – Investor and Property Owner', *The Granville Guardian*, vol. 18, issue 2 (2011), p. 3; G Walsh, 'Kelly, Thomas Hussey (1830-1901)', *Australian Dictionary of Biography* at website <http://www.adb.anu.edu.au/biography/kelly-thomas-hussey-3935> accessed 17 August 2014.

91 *Launceston Examiner*, 14 February 1878, p. 2; *Cornwall Chronicle*, 15 February 1878, p. 2.

92 *Launceston Examiner*, 8 March 1878, p. 2.

93 *Mercury*, 11 March 1878, p. 2.

smelter also came from Sydney.⁹⁴

The smelter was established to save shipping the ore to Sydney, which it did successfully.⁹⁵ In 1877 3,526 tons of tin ore were exported from Tasmania, which went mainly to Sydney. In 1878 the export of tin ore halved and in the first full year of the smelter's operation only 75 tons of ore were exported.⁹⁶ The smelter achieved a monopoly for its owners of the ore that previously went to Sydney, where it was shared with the other Sydney smelters. The smelter prospered and in April 1878 another furnace was built.⁹⁷ In June 1878 the *Launceston Examiner* noted that the Mount Bischoff smelter was only treating its own ore and the Tasmanian Tin Smelting Company was buying ore from the north-east mines, but that a lot of ore was being stored in bags awaiting a rise in the tin price.⁹⁸

In April 1879 the Tasmanian Tin Smelting Company made an audacious offer to takeover the Mount Bischoff smelter on a seven year contract.⁹⁹ It offered to smelt Mount Bischoff ore for 45 shillings per ton and return 70 per cent of the ore as refined tin—a saving of three shillings per ton and a 3 per cent increase in the recovery of tin. This would, it was claimed, save the Mount Bischoff Company £6,000 per annum. The offer was rejected by the directors of the Mount Bischoff Company as 'not likely to produce the savings promised'.¹⁰⁰ The offer was part of an unsuccessful campaign by dissident Hobart shareholders of the Mount Bischoff Company, aided by Robert Gardner of the Tasmanian Tin Smelting Company, to attack the company's management.¹⁰¹ They presented the Mount Bischoff Company with a list of demands, including a reorganisation of the smelter, the employment of a smelting manager at a lower salary and the employment of a qualified assayer.¹⁰² The directors of the Mount Bischoff Company defended the performance and competency of William Jenkin, but did agree to the appointment

94 *Launceston Examiner*, 8 March 1878, p. 2.

95 *Launceston Examiner*, 8 March 1878, p. 2.

96 Table 2 in Appendix 3.

97 *Tasmanian Mail*, 20 April 1878, p. 16.

98 *Launceston Examiner*, 8 June 1878, p. 1S.

99 *Mercury*, 28 April 1879, p. 1; *Mercury*, 29 April 1879, p. 3.

100 *Mercury*, 29 April 1879, p. 3.

101 *Launceston Examiner*, 4 August 1879, p.2, 5 September, p. 2.

102 *Launceston Examiner*, 4 August 1879, p. 2

of Edward Woodgate as its assayer.¹⁰³

In July 1886 Gardner, on behalf of the Tasmanian Tin Smelting Company, offered to exchange 15 tons per week of north-east ore for Mount Bischoff ore, which was agreed to as the Mount Bischoff ore was, at the time, very refractory and proving difficult to smelt.¹⁰⁴ This was perhaps an unsuccessful attempt by Gardner to stop the Mount Bischoff Company from purchasing ore from north-east Tasmania. The Tasmanian Tin Smelting Company closed its smelter in December 1887, after reaching an agreement with the Mount Bischoff Company.

Anchor Tin Smelter

The Anchor tin mine was the largest and most important mine on the Blue Tier. It was initially owned by a Tasmanian company, but was sold to an English syndicate in 1895, who formed the Anchor Tin Mine Company.¹⁰⁵ In 1899 the company embarked on an ambitious plan to increase ore production. This involved constructing a water race from the George River to ensure a regular supply of water to power the mine machinery and to process the ore, as the mine was frequently idle during dry periods due to insufficient water.¹⁰⁶ The water race, which was not finished until June 1902, was a failure and the only effective section was the last few kilometres that brought water from the Groom River and Crystal Creek.¹⁰⁷

In anticipation of increased ore production the company built a smelter at St Helens.¹⁰⁸ In May 1899 it applied for a portion of the Government reserve at St Helens on which to build a smelter.¹⁰⁹ The smelter, designed to process 40 tons of tin ore per week, was expected to generate a profit of £14 per ton by avoiding the heavy deductions for smelting and other charges.¹¹⁰ Work started on the site in

103 *Launceston Examiner*, 28 July 1879, p. 3; *Mercury*, 26 July 1879, p. 2.

104 *Launceston Examiner*, 31 July 1886, p. 3.

105 *Mercury*, 17 June 1896, p. 4.

106 *Mercury*, 4 November 1899, p. 4; *Report of the Secretary for Mines for 1900-1901* (Hobart, 1901), p. xi.

107 *Mercury*, 23 June 1902, p. 2; J Lewis, 'Exploitation of a Large Low-Grade Tin Deposit', *Chemical Engineering and Mining Review*, vol. 17 (1924), p. 466.

108 In the 1880s the town of Georges Bay was renamed St Helens.

109 *Mercury*, 9 May 1899, p. 3.

110 *Mercury*, 9 May 1899, p. 3.

December 1899 following the appointment of Edward Woodgate as the smelter manager.¹¹¹ The contract to build the smelter was awarded in March 1900 to Messrs Stabb Bros. of Hobart.¹¹² They made good progress and by May the concrete foundations for the furnace were finished, the excavation for the chimney stack had commenced and the brick walls of the assay office were up and ready for the roof.¹¹³ The finished chimney was 75 feet in height. The smelter only had one furnace, but included provision to install a second one if warranted.

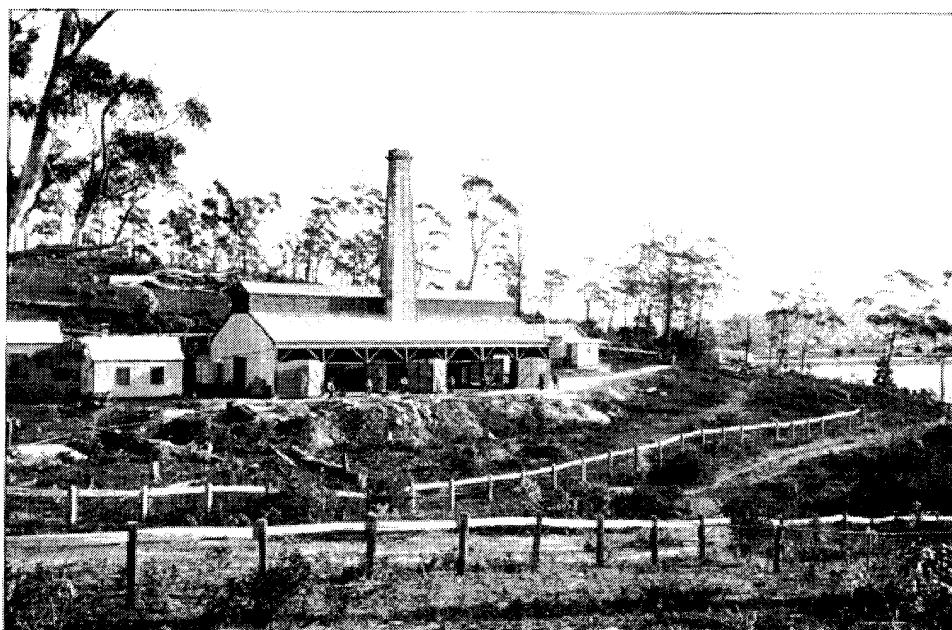


Figure 1 – The Anchor Tin Smelter at St Helens¹¹⁴

The opening of the smelter was anticipated by the tin miners of the area, as a means of obtaining 'fuller value for their tin'.¹¹⁵ It was also expected to 'revive business at St Helens and bring prosperity to our district generally'.¹¹⁶ In preparation for the smelter's start the company advertised for 'two good furnace hands' in both the *Mercury* and *Examiner* newspapers.¹¹⁷ It also advertised to

111 *Mercury*, 5 December 1899, p. 3; *Launceston Examiner*, December 1899, p. 2.

112 *Mercury*, 17 March 1900 p. 4.

113 *Examiner*, 9 May 1900, p. 3.

114 *Report of the Secretary for Mines for 1900–1901* (Hobart, 1901), p. xiv.

115 *Report of the Secretary for Mines for 1899–1900* (Hobart, 1900), p. 27.

116 *Mercury*, 5 December 1899, p. 3.

117 *Mercury*, 1 September 1900, p. 6; *Examiner*, 29 August 1900, p. 7.

purchase tin ore.¹¹⁸

The smelter, which cost £3,397 to build, started production on 30 September 1900 and the first ingots of tin metal were on display the next morning.¹¹⁹ A small ingot was also sent to the Secretary for Mines, William Wallace.¹²⁰ The smelter closed in April 1901 after operating for less than six months.¹²¹ It treated only 191 tons of tin ore and produced 124 tons of tin.¹²²

The Anchor smelter was the last tin smelter built in Tasmania. The decreasing production from the Tasmanian tin mines and the dominant position of the Mount Bischoff smelter would have deterred new smelters from starting.¹²³ The Anchor smelter was built close to its mine, as was the Stanhope smelter. The other smelters, which were built in Launceston and Hobart, treated ore shipped to the smelter. All the smelters used reverberatory furnaces and all had smelting managers, who originally came from outside Tasmania. All, except the Stanhope smelter, used imported coal for both heating the furnace and for reducing the tin ore to tin metal. The Stanhope smelter, because of its remote location used local wood for heating and charcoal for the reductant.

118 *Mercury*, 24 September 1900, p. 1.

119 *Examiner*, 4 January 1907, p. 2; *Examiner*, 10 October 1900, p. 5.

120 *Mercury*, 29 October 1900, p. 3.

121 *Examiner*, 29 April 1901, p. 4.

122 *Examiner*, 2 January 1903, p. 2.

123 Table 3 in Appendix 3.

CHAPTER 2 – CLOSURE DUE TO INTERNAL FACTORS

Both the Hobart Town Tin Smelting Company and the Anchor smelter closed due to internal factors, including the competency of the smelters' management, the competency of the smelting managers and the capitalisation of the smelter. These factors are assessed in this chapter.

Hobart Town Tin Smelting Company

The Hobart tin smelter started in June 1877 and was owned by the Hobart Town Tin Smelting Company. When it closed in 1885 it was a private company. In the intervening period it had at least five crises and closed temporarily on several occasions. Three of the crises were due to internal factors and two to external factors. The former were the failure of the original furnaces and loss of tin on two separate occasions. These were due to the failure of the management and directors of the Hobart Town Tin Smelting Company to exercise control over the company's affairs. The shareholders in appointing the company's directors had failed to heed the caution provided by Sir James Wilson in June 1876. He warned the shareholders to be 'especially careful in the appointment of a committee [directors]...because unless that was properly attended to success would be almost impossible'.¹

At the first half-yearly meeting of the Hobart Town Tin Smelting Company, which was held in August 1877, the shareholders were informed that the smelter had cost £1,350 to build, considerably more than the original estimate of £750, and that the company had not made a profit.² The latter was blamed on the need to repair the furnaces, due to defective construction. The repairs were initially successful and no further problems were encountered in the next ten weeks. However, in November and most of December 1877 one furnace was rebuilt to a new design and the other modified, during which time the smelter was idle.³

John Webber, who replaced Thomas Carpenter as the smelting foreman in January 1878, detailed the problems with the furnaces, which were more serious

1 *Mercury*, 7 June 1876, p. 2.

2 *Mercury*, 31 August 1877, p. 3.

3 J Webber, 'Hobart Town Tin Smelting Works', *Mercury*, 23 March 1878, p. 3.

and required further repairs than had been previously indicated at the first half-yearly meeting.⁴ In the four months after the smelter started one-third of the time was taken up repairing the furnaces. They were also inefficient requiring sixteen to twenty hours to reduce the charge of tin ore, instead of the normal eight to ten hours. After persisting for four months, Webber informed the directors of these problems and was given one furnace to modify.⁵ This furnace was rebuilt on the Cornish principle and smelted satisfactorily, according to Webber, apart from the need to replace some fire-bricks near the flue.⁶ This was the basis for the erroneous allegation by Carpenter that Webber's furnace had collapsed costing the company between £300 and £400.⁷ Webber claimed that following the success of his furnace Carpenter modified the other furnace to the same design. This claim was rejected by Carpenter, who had previously advised that the original furnaces would have a long life and only the linings would need to be replaced, periodically, at a relatively slight cost.⁸

Carpenter vigorously defended both the design of his furnaces and his smelting ability.⁹ The design was based on Vivian's copper reducing furnaces in England, which he claimed used one-third less fuel than the traditional Cornish reverberatory tin furnaces. Carpenter blamed the failure of his furnaces on the poor quality of the firebricks that he had to use and the corrosive nature of the Tasmanian tin ores. In defending his ability to smelt tin ore, he stated that he had smelted some thousands of tons of tin ore for Messrs Mort and Co and Messrs Amos and Co. He failed, however, to mention that he had been dismissed from both these smelters.¹⁰ He unsuccessfully sued Messrs Mort and Co., the owners of the Pymont Tin Smelting and Refining Company, for wrongful dismissal in the New South Wales Supreme Court.¹¹ After a two day trial the jury found for the

4 J Webber, 'Hobart Town Tin Smelting Works', *Mercury*, 23 March 1878, p. 3. John Webber was born in Cornwall in 1848 and had twelve years' experience in tin smelting in England and another two years' in Australia.

5 J Webber, 'The Tin Smelting Works', *Mercury*, 18 April 1878, p. 3.

6 J Webber, 'Hobart Town Tin Smelting Works', *Mercury*, 23 March 1878, p. 3.

7 'The Trifler', *Tasmanian Mail*, 9 March 1878, p. 13.

8 *Mercury*, 31 January, 1877, p. 2; T Carpenter, 'The Smelting Works Mr. Carpenter in Reply', *Mercury*, 9 April 1878, p. 3.

9 T Carpenter, 'The Smelting Works Mr. Carpenter in Reply', *Mercury*, 9 April 1878, p. 3.

10 J Webber, 'The Tin Smelting Works', *Mercury*, 18 April 1878, p. 3.

11 *Sydney Morning Herald*, 16 November 1876, p. 7; *Evening News*, 16 November 1876, p. 2.

defendants and against Carpenter. Evidence during the trial indicated that the smelter cost £5,805 to build, compared with an estimate by Carpenter of £1,500. The furnaces, which Carpenter designed, required rebuilding after only thirteen hours operation and again after thirty hours. Thomas Mort claimed that the smelter was so badly constructed and managed that Carpenter appeared to be ignorant of smelting. A similar claim was made by Webber, who asserted that 'Mr. Carpenter's work and the results of his smelting shew him to have very little knowledge of furnace building, or of the smelting of tin ores'.¹²

These comments are not surprising as Thomas Carpenter was a mining engineer, not a smelter-man. He was born in Cornwall and emigrated to Australia in 1851 as the mining engineer for the Australasian Gold Mining Company.¹³ When this company failed he moved to Bendigo, where he established a business for the refining of gold.¹⁴ He twice represented gold mining electorates in the Legislative Assembly in the Victorian Parliament.¹⁵ His knowledge of tin smelting was probably acquired during his early life in Cornwall and during a visit to Europe in 1868, when he unsuccessfully attempted to obtain capital for the Winter's Freehold Company (a gold mining company).¹⁶ In 1873 Carpenter entered into an arrangement with Thomas Mort, who was a successful businessman in New South Wales, and others to build a tin smelter in Sydney.¹⁷ He designed the furnaces, which he advised incorporated improvements that he had seen in England in 1868.¹⁸ When the Pymont smelter experienced difficulties Carpenter blamed them on the inexperience of the smelter-men and the colonial tin ores, which apparently required different treatment to ores in Cornwall. After he left the Hobart smelter he returned to Victoria and died in Ballarat in October 1882.¹⁹ His obituary indicated that he was 'an original character, enthusiastic and

12 J Webber, 'Hobart Town Tin Smelting Works', *Mercury*, 23 March 1878, p. 3.

13 Parliament of Victoria website at <http://www.parliament.vic.gov.au/re-member/bioregfull.cfm?mid=270> accessed 10 June 2014.

14 *Argus*, 28 December 1855, p. 5.

15 Parliament of Victoria website at <http://www.parliament.vic.gov.au/re-member/bioregfull.cfm?mid=270> accessed 10 June 2014.

16 *Ballarat Star*, 11 September, 1868, p. 4.

17 *Evening News*, 16 November 1876, p. 7.

18 *Sydney Morning Herald*, 4 February 1874, p. 7.

19 *Bendigo Advertiser*, 18 October 1882, p. 2.

ingenious, gifts which would have commanded a solid success in life, but all more or less neutralised by a too voluble command of language and want of judgement'.

Carpenter's performances in Sydney and Hobart were similar—poor design of the furnaces, more expensive to build than estimated and poor knowledge of smelting practice. The appointment of Carpenter as the smelting manager of the Hobart Town Tin Smelting Company, after his unsuccessful attempt to sue Messrs Mort and Co, which was reported in the NSW newspapers, suggests that the company's directors did not carry out any check on Carpenter prior to his appointment. The directors, however, may not have had a choice, because the large number of tin smelters established in the period 1872 to 1876 would have resulted in a dearth of experienced smelting managers.

Carpenter was also blamed for the loss of between 27 and 40 tons of tin, which the company reported at its second half-yearly meeting in February 1878. Carpenter, who as a shareholder was at the meeting, denied responsibility. He suggested that the secretary's report was a tissue of lies and blamed two unnamed directors for acting against the interests of the company and alleged that they had brought a most promising speculation to the verge of ruin. Carpenter also accused the directors of demolishing one of the original furnaces, even though, according to him, it was doing excellent work. The meeting did not accept the secretary's report and a committee was appointed to examine the report. 'The Trifler' in the *Tasmanian Mail* asserted that 'nowhere else on the globe could the management be equalled for audacity and incompetency'.²⁰

The loss, which came as a surprise to the company's chairman, William Hammond, was blamed by him initially on 'the mismanagement by somebody', who was not named. Later at an extraordinary general meeting in April 1878 he was more forthright and advised that 'Mr. Carpenter was to be alone held responsible' for the loss.²¹ It is interesting that the directors accepted no responsibility for the loss, but in their defence they received no payment for being directors. A later attempt to pay them was not pursued, due to the company's

20 'The Trifler', *Tasmanian Mail*, 9 March 1878, p. 13.

21 *Mercury*, 19 April 1878, p. 3.

financial position.²² Webber defended the directors in a letter to the *Mercury*.²³ He advised that they 'could not have done more for the company's good than they did'. He claimed that Carpenter had tried to prevent the directors from finding out the true state of the company's affairs, a claim rejected by Carpenter.²⁴ One of the directors, Philip McArdell, was credited with preventing a worse loss by his constant supervision of the company's affairs, which apparently upset Carpenter, who complained that McArdell was 'obnoxiously officious' to him.²⁵ When McArdell advised that he could not continue to devote so much time to the company without remuneration, he accepted an offer of 30 shillings per week to manage the outdoor business of the company under the direction of the board of directors. This was an attempt by the shareholders to provide more direct supervision of the smelter.

Attempts to find the missing tin were unsuccessful. McArdell suggested that it was either stolen or lost through the poor construction of the original furnaces.²⁶ Carpenter stated that it was in the slag, but chemical analysis of the slag indicated that it was not therein.²⁷ In support of Carpenter's view the company sold 110 tons of slag in 1878 and 172 tons the following year to the Sydney smelters, which indicates that the slag contained realisable tin.²⁸

To save money the company reduced the wages of employees and arranged, in February 1878, for Dagobert Lewald, who had an analytical laboratory in Hobart, to do their assays for nothing in return for using the company's premises for his laboratory.²⁹ 'The Trifler' in the *Tasmanian Mail* warned against this arrangement as 'that which costs nothing will likely to be found to be worth nothing'.³⁰ How long this arrangement lasted is not known, because in August 1879 Lewald was

22 *Mercury*, 28 February 1879, p. 3.

23 J Webber, 'Hobart Town Tin Smelting Works', *Mercury*, 23 March 1878, p. 3.

24 T Carpenter, 'The Smelting Works Mr. Carpenter in Reply', *Mercury*, 9 April 1878, p. 3. The letter from Carpenter wrongly named the director as J McArdell rather than his brother P McArdell.

25 *Mercury*, 19 April 1878, p. 3; T Carpenter, 'The Smelting Works Mr. Carpenter in Reply', *Mercury*, 9 April 1878, p. 3.

26 *Mercury*, 19 April 1878, p. 3.

27 *Mercury*, 19 April 1878, p. 3.

28 R Johnston, *Systematic Account of the Geology of Tasmania* (Hobart, 1888), p. 31.

29 *Mercury*, 30 March 1878, p. 3; *Mercury*, 11 February 1878, p. 2; *Mercury*, 9 August 1877, p. 1.

30 'The Trifler', *Tasmanian Mail*, 6 April 1878, p. 13.

being paid £2 2s per week.³¹ The services of an assayer were required, after Carpenter was dismissed, as presumably Webber was not competent to do the assays, which were a critical part of the smelting process.

The loss of the tin, valued at £1,800, together with a decrease in the price of tin placed the company in a difficult financial position, which was outlined to the shareholders at an extraordinary general meeting held in March 1878 and attended by nineteen shareholders representing 270 shares.³² Hammond advised that the company owed the bank £7,958 and had assets of £5,228 in tin and uncalled capital of £3,000. Hence they had £8,228 to pay the claim of the bank, leaving a balance of £270. This was deemed insufficient and he considered that the shareholders had two options; either to wind up the company or to increase the capital of the company. The shareholders decided on the latter and the capital was increased by the issuance of an additional 500 shares at £10 each and these shares were to be issued as paid up to £4. The shareholders further resolved to make a call of £1 per share upon the whole capital of the company, payable in four equal instalments over six months. The increase in the company's capitalisation was an acknowledgement that the company was initially under-capitalised at only £2,000. Hammond considered it unlikely that the general public would take up any of the new shares, as the course adopted was simply to regain what had already been lost. The directors were, nevertheless, optimistic that the company had a bright future before it and had a chance of redeeming the losses already sustained. The shareholders shared the directors' optimism as 465 out of the 500 newly issued shares were taken up. Only one shareholder did not take up his allocation.³³

The efforts of the company to redress its poor performance were successful. At its third half-yearly meeting in August 1878 the company announced it had assets of £36,733 and liabilities of £33,426, leaving a balance of £3,307.³⁴ As this included the money raised by the share issue and the call on shareholders, the profit for the six months was about £500.³⁵ In the next six months, July to

31 *Launceston Examiner*, 5 August 1879, p. 2.

32 *Mercury*, 30 March 1878, p. 3.

33 *Mercury*, 19 April 1878, p. 3.

34 *Mercury*, 31 August 1878, p. 3.

35 The profit was calculated based on the issuance of 465 shares at £4 each, raising £1,860 and a

December 1878, the company made a profit of £857, which it attributed to a reduction in working expenses through the efforts of McArdell.³⁶ McArdell was rewarded with an increase in his salary to 50 shillings per week. This was approved at the fourth half-yearly meeting held in February 1879, despite Charles Davies, who was the co-owner of the *Mercury*, questioning whether McArdell could be both a paid servant of the company and a director. He unsuccessfully called on McArdell to resign as a director. A salary increase for the general manager, Richard Butler, from £2 to £3 per week, was also approved, but a proposal from Webber to purchase a disintegrating mill for £600 to process the slag and waste bricks was defeated.

The success of 1878 was short-lived as by April 1879 the company was again missing tin.³⁷ The deficiency was then five tons and according to Butler the directors were informed of this. However, the directors, who were allegedly informed—Ireland, Knight, Crosby and McArdell—denied receiving any notification and there was nothing recorded in the board minutes. By August the deficiency had increased to 25 tons, but 7 tons were subsequently recovered when the accumulated slag was processed leaving a deficit of about 18 tons.³⁸ The loss of tin forced the closure of the smelter in September 1879 and it was advertised for lease or sale.³⁹ The smelter remained closed until it was sold in September 1880, when presumably the Hobart Town Tin Smelting Company was wound up.⁴⁰

An acrimonious general meeting of shareholders was held in November 1879.⁴¹ It was chaired by Hammond and twenty-five shareholders attended. Hammond indicated that the company's liabilities exceeded its assets by £2,600 and the directors proposed to make a call of £3 per share to meet the liability. The directors expressed surprise at the parlous state of the company, as up until April they thought that the company was making a profit of about £80 per month.

£1 call per share on all shares raising £930. It is assumed that only the shareholders who bought the newly issued shares paid the £1 call.

36 *Mercury*, 28 February 1879, p. 3.

37 *Mercury*, 4 November 1879, p. 3.

38 *Mercury*, 4 November 1879, p. 3.

39 'Mohican', 'Hobart Town Tin Smelting Company', *Launceston Examiner*, 11 September 1879, p. 3; *Launceston Examiner*, 25 September 1879, p. 2; *Mercury*, 1 October 1879, p. 1.

40 *Mercury*, 4 September 1880, p. 2.

41 *Mercury*, 4 November 1879, p. 3.

Hammond said that 'the directors disclaimed any blame' for the situation, as they were simply businessmen with no knowledge of smelting operations. He believed that the shareholders had appointed a general manager and one of the directors, Philip McArdell, to look after their interests. Hammond, surprisingly, advised that McArdell, although a director, was 'in no way connected with the directors, but was forced upon them' by the shareholders. Edward Crowther, who had proposed that McArdell be paid to manage the outdoor business of the company, indicated that he had made a mistake in 'giving that gentleman a billet'. When McArdell also expressed surprise at the deficiency a shareholder remarked, that as a paid director, he 'could not have been paying much attention to his duties'. McArdell replied that 'he had been at the company's works night and day'.

John Webber suggested that the loss had been slowly accumulating, which he attributed to assay error by Lewald, but paradoxically he did not question Lewald's ability and believed that he was 'a thoroughly efficient assayer'.⁴² In a later letter to the *Mercury*, Webber reiterated that the loss of tin had been accruing since March 1878, but was not detected earlier because of the amount of slag accumulated waiting for a crushing plant.⁴³ The loss was about 0.75% per cent of the tin ore smelted and would have been detected earlier if the company had engaged in a monthly clean-up of the smelter. He was positive that with an impartial assayer and less officers the company could have been a 'grand success' and proposed that the company undertake a smelting trial of 100 tons of ore, which he said should generate a profit of £112. McArdell attacked Webber's suggestion and considered that it would prove nothing, as he believed that the tin was stolen.⁴⁴ In support for McArdell's supposition two ingots of tin were later recovered from the River Derwent off the Powder Jetty.⁴⁵ Patrick Flack and John Taylor were subsequently remanded on a charge of stealing tin from the Hobart Town Tin Smelting Company and William Hackett, a plumber, was charged with receiving the same.⁴⁶ However, when the matter was brought to court the police

42 *Mercury*, 4 November 1879, p. 3.

43 J Webber, 'Hobart Town Tin Smelting Co.', *Mercury*, 17 November 1879, p. 3.

44 P McArdell, 'Tin Smelting Works Again', *Mercury*, 21 November 1879, p. 3.

45 *Launceston Examiner*, 18 March 1880, p. 3.

46 *Launceston Examiner*, 20 March 1880, p. 2.

offered no evidence and the accused were discharged, when the company could not identify the tin as being theirs.⁴⁷ This was because the face of the ingots was rough and bore no brand, which was attributed to the lettering in the mould being filled with sand to prevent the brand from showing.⁴⁸ Although, the tin found in the River Derwent must have come from the company, it is unknown who in the company was complicit in its theft.

The company's net liability of £2,600 was almost twice the value of the missing tin, which was worth about £1,400.⁴⁹ The reasons for this difference of about £1,200 was, inexplicably, not raised at the general meeting held in November 1879. The £1,200 was not due to a decrease in the price of tin, as at this time tin prices were increasing, not falling.⁵⁰ Potential reasons to account for the £1,200 range from poor accounting procedures of the tin received in the ore or sold in the slag through to misappropriation of the company's money.

A correspondent to the *Mercury* suggested two other reasons for the company's failure. First, was the high cost of officials of £12 12s per week, made up of a general manager £3 per week, a paid director £2 10s per week, a smelter manager £5 per week and an assayer £2 2s per week.⁵¹ In contrast William Jenkin at the Mount Bischoff smelter apparently combined all these functions at a lower weekly salary.⁵² Second, was the 'quantity of metal in the slag, as ascertained by repeated analyses, and which...went to swell the coffers of the Sydney smelters'. This tin would have been recovered at the Hobart smelter if the shareholders had approved the purchase of a crushing plant. In 1878, 172 tons of slag were sold to the Sydney smelters.⁵³

The *Mercury* lamented the closure of the smelter and blamed the company's

47 *Mercury*, 20 March 1880, p. 2.

48 *Launceston Examiner*, 23 March 1880, p. 2.

49 The missing tin was valued at £69 per ton, which was the average price realised in 1879 as given in Table 2 in Appendix 3.

50 Table 2 in Appendix 2.

51 'Advance Tasmania', 'The Hobart Town Tin Smelting Company', *Mercury*, 30 August 1880, p. 3.

52 *Launceston Examiner*, 1 February 1881, p. 3. In 1880 Fred Kayser, the mining manager at Mount Bischoff, was being paid £10 per week. Jenkin, the smelting manager, with less responsibility based on the number of employees at the mine and smelter, would presumably have been receiving a lower salary.

53 Johnston, *Geology of Tasmania*, p. 31.

management, which had been so faulty as to reflect on the business capacity of the city.⁵⁴ It wondered at the 'laxity of control; at the want of unison; at the absence of all sense of duty' and at 'the spirit of antagonism on the part of those the company had a right to rely on'. The *Mercury* commented that the smelter was not started as a speculative venture, but in the public interest to attract business to the city.

The closure was also lamented by the tin miners who shipped through Georges Bay. James Bonnar of Goulds Country claimed that since the closure of the smelter the tin miners had received a lower price for their ore, the assays of the ore were lower and the weights of ore less than they should be.⁵⁵ He suggested that the larger mining companies should do their own smelting and break the monopoly of the Launceston tin buyers. Bonnar's letter provoked a swift response from Augustus Simson, a Launceston tin buyer.⁵⁶ He believed that any discrepancy in the weights of tin ore was due to inaccurate spring balances used by the miners. With respect to the price paid by the buyers, Simson explained why there was a perceived problem, but he did not directly address the concerns on low assays, apart from stating the problems in obtaining representative samples for assay. Simson's defence of the Launceston tin buyers did not satisfy a number of tin miners and the complaints continued. 'A Tin Ore Producer' from Georges Bay, repeated the claims of Bonnar on low assays and short weights.⁵⁷ A 'Mining Manager' from Thomas Plains went further and accused the Launceston tin buyers and smelters of fleecing the mining companies.⁵⁸ He complained that since the closure of the Hobart smelter the assays of the ore had decreased by at least 3 per cent. He did not believe that the Hobart smelter's assays were too high, as similar values were obtained by the Sydney smelters. There were no complaints from the miners who shipped through Bridport and Boobyalla indicating that they were unaffected by the closure of the Hobart smelter.

The letters from the Georges Bay tin miners tended to provide support to Webber's view that Lewald's assays on the tin ore were too high and overgenerous

⁵⁴ *Mercury*, 5 November 1879, p. 2.

⁵⁵ J Bonnar, 'Price, Assay, and the Weight of Tin Ore', *Mercury*, 22 July 1880, p. 3.

⁵⁶ A Simson, 'Price, Assay, and the Weight of Tin Ore', *Mercury*, 29 July 1880, p. 3.

⁵⁷ 'A Tin Ore Producer', 'Price, Weight, and Assay of Tin Ore', *Mercury*, 30 July 1880, p. 3.

⁵⁸ 'Mining Manager', 'Our Tin Assays', *Mercury*, 23 August 1880, p. 3.

to the tin miners. Lewald should have been a competent assayer, as he was a graduate of the Universities of Berlin and Breslau, and had worked in England and Victoria.⁵⁹ He came to Tasmania in February 1875, as the analyst for the Tamar Hematite Ironworks Company.⁶⁰ After that company closed, he moved to Hobart and began advertising his services to perform metallurgical assays.⁶¹ He became the assayer for the Hobart smelter in February 1878 and the next month he was appointed as the honorary government analyst.⁶²

None of the reasons advanced to explain the closure of the Hobart Town Tin Smelting Company involved external factors. They all relate to the competency of the company's management by the shareholders, directors and paid officials.

The fate of the Hobart Town Tin Smelting Company was similar to that of the Lal Lal iron smelter in Victoria, which was built in February 1874 to exploit the iron deposits in the Ballarat area.⁶³ The Lal Lal smelter was idle for prolonged periods and was owned by a number of companies; some of whom appeared to be under-capitalised, before it finally closed in 1889. The initial failure of the smelter was blamed on a lack of entrepreneurial and technical ability. The subsequent failure was attributed to managerial ineptitude.

Anchor Tin Smelter

The smelter of the Anchor Tin Mine Company started production on 30 September 1900.⁶⁴ The smelter, however, was soon shut-down, although temporarily, for lack of tin ore as dry weather restricted production at the Anchor mine.⁶⁵ In desperation the Company unsuccessfully advertised to buy tin ore of any quantity for 'best terms and cash payments'.⁶⁶ The smelter closed permanently in April 1901 after operating for less than six months.⁶⁷ However, it was not

59 *Mercury*, 9 July 1877, p. 1; *Mercury*, 25 September 1877, p. 2.

60 *Cornwall Chronicle*, 29 March 1875, p. 1; *Australasian*, 13 February 1875, p. 13.

61 *Mercury*, 9 August 1877, p. 1.

62 *Mercury*, 5 March 1878, p. 2.

63 G Linge, *Industrial Awakening: A Geography of Australian Manufacturing 1788 to 1890* (Canberra, 1979), pp. 347–348.

64 *Examiner*, 10 October 1900, p. 5.

65 *Zeehan and Dundas Herald*, 30 October 1900, p. 2.

66 *Mercury*, 29 October 1900, p. 1.

67 *Examiner*, 29 April 1901, p. 4.

demolished, because there was a proposal, in 1915, for the government to re-open the smelter.⁶⁸

After the closure of the smelter the London Board of the Anchor Tin Mine Company commissioned Captain James Harvey, a mining engineer, to provide a report on the company's operations.⁶⁹ He found that the furnace had a number of structural defects and the first 20 tons of ore smelted went straight through the furnace because of faulty construction. He also criticised the competence of the smelting manager, as Edward Woodgate was an assayer not a metallurgist. Harvey highlighted that costs could have been reduced by 16s 6d per ton by using wood instead of coal as the fuel and reductant. He recommended that the smelter remain closed until there was a guaranteed supply of 60 tons of tin ore per month—40 tons from the Anchor mine and 20 tons purchased. He was, however, pessimistic that the required tonnage could be found and concluded that the 'smelter must follow the mine, and not the mine the smelter'. After the closure of the smelter the company sent their ore to the Mount Bischoff smelter in Launceston.⁷⁰

The company's management was remiss in building the smelter, before the completion of the water race and the expected increase in ore production. The water race was not completed until June 1902 after the smelter had closed. Prior to the completion of the water race, in the period 1899 to 1902, the mine only produced 3 tons of ore per week, on average, whereas the smelter was designed to smelt 40 tons of ore per week.⁷¹

The Anchor smelter was similar to the Hobart smelter. Both experienced furnace problems due to faulty construction, both had smelting managers, who were criticised for their lack of knowledge of smelting practice and both ultimately failed due to the lack of tin ore to sustain the smelter. Hence the lessons of the Hobart smelter were either not known or not appreciated by the Anchor Tin Mine Company.

68 *Daily Telegraph*, 15 January 1915, p. 2.

69 *Examiner*, 2 January 1903, p. 2.

70 *Mercury*, 4 June 1903, p. 6.

71 S Fawns, *Tin Deposits of the World, with a Chapter on Tin Smelting* 2nd edition (London, 1907). p. 106. In the financial year 1898–9 the Anchor mine produced 131 tons of ore. In the next three years it produced 153 tons, 141 tons and 146 tons, respectively.

CHAPTER 3 – CLOSURE DUE TO EXTERNAL FACTORS

Three Tasmanian tin smelters—the Stanhope smelter, the Hobart tin smelter and the Tasmanian Tin Smelting Company smelter—closed because of external factors, which were beyond the control of the smelter. These include the price of tin, the availability of tin ore and the availability of a competent smelter manager. In this chapter the reasons for closure of the three tin smelters are assessed and, where applicable, compared with the experience of other smelters in Australia.

Stanhope Smelter

The Stanhope smelter at Waratah started in January 1876, but was idle for at least two months in mid-1876, before restarting at the end of August 1876.¹ The smelter was again idle in early 1878, before restarting in February 1878.² It shipped 11½ tons of tin in September 1878, which was probably its last shipment.³ Nothing has been found in either the primary or secondary sources to suggest that the smelter was operating after September 1878. It was definitely closed by February 1879, as the Stanhope company was sending its ore to Launceston.⁴ In April 1879 the Stanhope mine stopped work and the company was apparently in financial difficulties as a mortgagee's sale was advertised.⁵ The mine was idle for over a year, before restarting in July 1880.⁶ The following year the company reported at its half-yearly meeting that it was 'just getting "out of the wood"' and hoped to start paying a dividend before too long.⁷ The smelter, although closed, was not demolished, as the furnaces were listed in the assets of the company when it was advertised for sale in 1888.⁸

Tin was an internationally traded metal and Tasmanian tin was sold based on the price on the London market. This price was regularly reported in the Tasmanian newspapers, indicating the importance of tin to the Tasmanian

1 *Launceston Examiner*, 8 July 1876, p. 4; *Mercury*, 29 August, 1876 p. 3.

2 *Launceston Examiner*, 18 February 1878, p. 2.

3 *Cornwall Chronicle*, 10 September 1878, p. 2.

4 *Mercury*, 18 February 1879, p. 3.

5 *Mercury*, 29 April 1879, p. 2; *Launceston Examiner*, 16 May 1879, p. 4.

6 *Mercury*, 22 July 1880, p. 3.

7 *Argus*, 11 August 1881, p. 6.

8 *Argus*, 8 November 1888, p. 3.

economy. In the 1870s and 1880s the tin price fluctuated widely, due in part to market speculation.⁹ In this period the maximum price was £160 in 1872, before dropping to a low of only £53 in October 1878.¹⁰ This low price was probably the reason why the Stanhope smelter closed, as it was not financially viable. The use of wood, instead of coal, did not save the company money, because for every ton of tin ore smelted about four tons of wood and half a ton of charcoal were required, compared with one ton of coal.¹¹

The smelter may also have had technical problems in smelting the ore from the Stanhope mine. When the Mount Bischoff smelter processed this ore it took twelve to fourteen hours to smelt, instead of the normal eight hours, because of the high levels of impurities in the ore and the slag was too refractory to remelt.¹² The slag also had a high level of tin, which was used by the opponents of the management of the Mount Bischoff smelter to attack the competency of William Jenkin, the smelting manager. The long smelting time increased the cost of wood used in the furnace as fuel, while the high level of tin in the slag decreased the amount of tin recovered. Both would have adversely impacted on the company's financial position. In 1877 the Stanhope smelter produced only 203 tons of tin and was probably too small to be economically viable, irrespective of the tin price.

The experience of the Stanhope smelter appears similar to that of the Tent Hill tin smelter in New South Wales, which was built three months earlier, in October 1875. Both smelters were in remote locations where coal was either difficult or expensive to obtain and both used wood for fuel and charcoal for smelting. The Tent Hill smelter had metallurgical problems, due to using wood and charcoal, which coupled with the low tin price resulted in the smelter having financial difficulty.¹³

There is no indication that the Stanhope smelter was closed, because of internal factors, such as the competence of the smelter-men, even though Nicol

9 Table 2 in Appendix 3.

10 S Fawns, *Tin Deposits of the World, with a Chapter on Tin Smelting* 2nd edition (London, 1907), p. 268; *Cornwall Chronicle*, 29 October 1878, p. 3.

11 *Launceston Examiner*, 17 February 1876, p. 2; *Mercury*, 14 March 1876, p. 2.

12 *Mercury*, 2 June 1879, p. 3.

13 *Brisbane Courier*, 13 October 1876, p. 3; G Blainey, *The Rush That Never Ended: A History of Australian Mining* 4th edition (Melbourne, 1993), p. 129.

Turner, one of the smelter-men was originally a stone mason, who had emigrated from Scotland in 1854 aged 23.¹⁴ After a period on the Victorian gold-fields he became one of the proprietors of the Wellington Tin and Gold Mining Company at El Dorado, where he presumably learnt the craft of smelting. Following the closure of the Stanhope smelter he worked in the north-east tin mines for a number of years. For example, in 1881 he was appointed to the local board of the Wyniford River Company.¹⁵ He died at Lilydale in 1924, aged 94. No information has been found on Scott, the other smelter-man.

Hobart Tin Smelter

The Hobart tin smelter, which started in June 1877, was initially solely a custom smelter in that it bought tin ore and sold the tin metal, based on the tin price on the London market. Hence any change in the price of tin between when the ore was bought and the tin sold gave the smelter either a loss or a windfall profit. The smelter suffered both, but overall the effect of price changes was small, although it caused short term difficulty. In the second half of 1877 the tin price fell, which contributed adversely to the company's financial position by about £1,500.¹⁶ The decrease in the price of tin also forced the closure of a number of the mines in the north-east of Tasmania, while others were let out on tribute.¹⁷ During the second half of 1878 the price of tin fell to a low of £53 per ton in October, but by November the price had increased to £64 per ton.¹⁸ In response to the fall in the price the company started toll smelting, where the risk of a fall in the price of tin was borne by the mining company. In the six months to the end of December 1878 the company smelted a total of 488 tons of tin ore, which was split equally between purchased ore and ore that was toll smelted.¹⁹ The rise in the price of tin after October 1878 benefited the company by £1,000. Hence overall the fluctuations in the price of tin cost the company about £500, which it could

¹⁴ *Daily Telegraph*, 9 July 1924, p. 2. In this article El Dorado was spelt as Eldorado.

¹⁵ *Launceston Examiner*, 11 November 1881, p. 3.

¹⁶ *Mercury*, 30 March 1878, p. 3.

¹⁷ *Launceston Examiner*, 1 September 1877, p. 3.

¹⁸ *Cornwall Chronicle*, 29 October 1878, p. 3; *Launceston Examiner*, 15 November, 1878, p. 2.

¹⁹ *Mercury*, 28 February 1879, p. 3.

have weathered but for other difficulties.

The smelter had a capacity to smelt 50 tons of tin ore per week, but never operated at this rate, because it could not obtain sufficient ore. In the thirteen weeks up-to the first half-yearly meeting in August 1877 the Hobart Town Tin Smelting Company purchased 324 tons of ore for an average smelting rate of 25 tons per week.²⁰ The furnaces only operated at half of their capacity. The low furnace utilisation continued in 1878 when it smelted 932 tons of tin ore or about 18 tons per week to produce 646 tons of tin metal.²¹ This was the most it ever produced in a calendar year, but it was only 15 per cent of that year's Tasmanian production of 4,440 tons.

In an attempt to obtain more tin ore the company in January 1879 increased its payment for ore and also paid the cost of shipping the ore to Hobart.²² It paid 3d more per unit of tin than the Launceston smelters; 10s per unit compared with 9s 9d per unit.²³ These efforts were not successful as only 482 tons of tin were produced in 1879, although the smelter was closed in the latter part of the year.

The smelter remained closed for most of 1880 and the Hobart Town Tin Smelting Company was wound up, due to internal factors, as discussed in Chapter 2. In September 1880 the smelter was purchased by Richard Butler for about £500.²⁴ The reopened smelter, which was known as the Hobart Tin Smelting Works, despatched its first tin the following month.²⁵ The restart of the smelter was welcomed, as its closure had diverted considerable trade away from the merchants and storekeepers of Hobart.²⁶ The smelter was soon leased to John Webber and his brother William, who made a number of improvements.²⁷ They started a blacksmithing business, but it was short-lived closing in June 1881.²⁸ They also installed a three head quartz crushing battery for the crushing of slag

20 *Mercury*, 7 September, 1877, p. 2.

21 *Statistics of the Colony of Tasmania for the year 1878* (Hobart, 1879), p. 92.

22 *Mercury*, 8 January 1879, p. 2.

23 A unit of tin contained one-hundredth of a ton of tin.

24 *Mercury*, 4 September 1880, p. 2; 'Advance Tasmania', 'The Hobart Town Tin Smelting Company', *Mercury*, 30 August 1880, p. 3.

25 *Mercury*, 11 October 1880, p. 2.

26 *Mercury*, 7 September 1880, p. 2.

27 *Mercury*, 24 December 1880, p. 1.

28 *Mercury*, 13 November 1880, p. 1; *Mercury*, 24 June 1881, p. 1.

and waste bricks.²⁹

The change in ownership of the smelter resulted in no increase in the tonnage of tin produced and the smelter was not financially viable. In 1881 and 1882 only 371 tons and 257 tons of tin were produced, respectively, whereas a production of at least 400 tons per annum appeared to be required to cover costs. The break-even production was calculated based on fixed weekly costs of £20 for wages and £2 10s for incidentals and variable costs per ton of ore of £1 for coal and 2 shillings for wear and tear.³⁰

The Hobart smelter throughout its life treated only ore from the north-east mines that was shipped through Georges Bay, except for a very small quantity of ore from the west coast mines. In the first two months of the smelter's operation the Hobart Town Tin Smelting Company purchased 190 tons of ore sourced from more than thirty mines.³¹ These mines were all on the tin-fields near Georges Bay and hence shipped their ore through that port, as the poor state of roads in north-east Tasmania in the 1870s and 1880s forced the mines to ship from the nearest port. Three-quarters of the 190 tons of ore came from just nine mines and these were managed by non-Launceston companies or individuals and four of them—Ruby, Emu, Albert and Blue Tier mines—were managed by Arthur Butler, who was a shareholder in the Hobart Town Tin Smelting Company and the brother of Richard Butler.³²

Ore shipped from Georges Bay went to smelters in both Hobart and Launceston, because the distances by sea were similar. The two other north-east ports of Bridport and Boobyalla were much closer, by sea, to Launceston than Hobart and ore shipped through these ports went exclusively to Launceston. In 1882 the four tin-fields near Georges Bay produced slightly less than one-third of

29 *Mercury*, 25 June 1881, p. 2.

30 'Advance Tasmania', 'The Hobart Tin Smelting Company', *Mercury*, 30 August 1880, p. 3. The weekly wage cost comprised £5 for a smelting manager and assayer, £6 for two smelter-men at £3 each, £4 for two labourers at £2 each, £2 for two boys at £1 each and £3 for a general manager. The cost of £5 for incidentals and wear and tear per 25 tons of ore was assumed to be split between fixed and variable costs.

31 *Mercury*, 7 September 1877, p.2; 12 September, 1877, p. 3; 20 September 1877, p. 3; 27 September 1877, p. 2; 2 October 1877, p.2; 9 October 1877, p.2; 16 October 1877, p. 3; 25 October 1877, p. 2.

32 *Walch's Tasmanian Almanac 1878* (Hobart, 1879), pp 156 and 157.

the ore from the north-east mines—822 tons of ore out of a total of 2,656 tons—and only about half of this came to Hobart.³³ The Hobart smelter was unable to monopolise the ore shipped from Georges Bay, because the mines in the Georges Bay area that were managed by Launceston interests presumably sent their ore to Launceston, and also there was no advantage in shipping to Hobart compared to Launceston. The interrupted operation of the Hobart smelter would also have resulted in a loss of confidence by the miners.

The other potential source of tin for the Hobart smelter was the Mount Heemskirk tin-field on the west coast of Tasmania. At the inaugural meeting to establish the Hobart tin smelter in June 1876 Sir James Wilson envisaged that the west coast could supply tin ore to the Hobart smelter.³⁴ In 1878 the management of the Hobart smelter was optimistic that towards the end of the year large quantities of ore would be received from the west coast mines, which would require the erection of additional furnaces.³⁵ However, this did not eventuate and in 1882 the west coast mines only produced 27 tons of tin ore, despite the expenditure of over £40,000 on their development.³⁶

Presumably in anticipation of an increase in production from the Mount Heemskirk mines Messrs Riddoch, Watchorn and Wise purchased the smelter in April 1883. The new owners were shareholders in the west coast tin mines and in the ships that serviced these mines.³⁷ John Watchorn was a shareholder in the Extended All Nations Prospecting and Mining Company, Alex Riddoch was a director of the Orient Tin Mining Company, while Fred Wise was the chairman of directors of the Hobart Steam Navigation and Trading Company.³⁸ Riddoch was also a director of this company, which had purchased both the *Amy* and the *Wakefield* to service the west coast.³⁹ The *Mercury* expressed the hope that under new management the smelter would be more popular than hitherto and that the large quantities of tin ore being sent to Launceston would instead come to Hobart.

33 R Johnston, *Systematic Account of the Geology of Tasmania* (Hobart, 1888), p. 30.

34 *Mercury*, 7 June 1876, p. 2.

35 *Mercury*, 31 August 1878, p. 3.

36 Johnstone, *Geology of Tasmania*, p. 30; *Launceston Examiner*, 14 June 1882, p. 3.

37 *Mercury*, 18 April 1883, p. 2.

38 *Mercury*, 1 April 1882, p. 3; *Mercury*, 1 February 1883, p. 2.

39 *Mercury*, 29 May 1883, p. 3.

The new owners hoped to secure for Hobart a fair share of west coast trade and invoked issues of north-south rivalry as the north had the rich gold and tin fields while the south had absolutely nothing.⁴⁰

The smelter was renamed the Hobart Tin Smelting Company and the proprietors were anxious to re-establish an industry to the benefit of the community.⁴¹ They guaranteed correct and prompt returns for tin ore. The new owners tried to form a new company, the Hobart Tin Smelting and Assaying Works Company, with a capital of £4,000 in 40 shares each of £100.⁴² The freehold and plant of the company were also offered for sale at £1,800. However, the freehold was not sold as the *Valuation Roll for 1885* showed that Charles Knight still owned the land on which the smelter was sited, with Frederick Wise, John Watchorn and Alex Riddoch as the occupiers.⁴³ The proposed company also failed to eventuate as the advertisements for the smelter were unchanged in the six months from April 1883, before they stopped.⁴⁴ Despite this in July 1883, the *Mercury* advised that the smelter had been sold to a private company, who had almost entirely rebuilt one furnace and strengthened the other.⁴⁵ The smelter, which had been idle for some time, restarted in mid-July 1883.⁴⁶

The west coast tin mines, which were initially hailed as another Mount Bischoff, all failed and by January 1885 the Mount Heemskirk tin-field was deserted.⁴⁷ Ten companies had built mills to process the mined ore, but not one paid a dividend.⁴⁸ The failure of the Mount Heemskirk tin-field spelt the end of the Hobart smelter, although it continued to operate until October 1885, when it was sold to Frank Bond, who demolished the furnaces and erected a bark mill on the site.⁴⁹ The new owners, therefore, were no more successful in attracting ore to Hobart than the previous owners. In 1883 the smelter produced 156 tons of tin,

40 *Mercury*, 15 August 1882, p. 3.

41 *Mercury*, 30 April 1883, p. 1.

42 *Mercury*, 11 May 1883, p. 1.

43 *Valuation Roll for 1885* (Hobart, 1886), p. 32 (Tasmanian Linc TL.R 336.2209946 TAS 1885).

44 *Mercury*, 7 November 1883, p. 3.

45 *Mercury*, 10 July 1883, p. 2.

46 *Launceston Examiner*, 13 July 1883, p. 3.

47 L Whitham, *Railways, Mines, Pubs and People and other historical research* (Sandy Bay, 2002), p. 27; *Tasmanian Mail*, 17 January 1885, p. 20.

48 Blainey, *The Rush That Never Ended*, p. 209.

49 *Mercury*, 23 October 1885, p. 4; *Mercury*, 13 November, 1885, p. 2.

228 tons the following year and in its final year only 100 tons of tin.

The Hobart tin smelter ultimately closed because it could not obtain sufficient tin ore to be viable. A similar fate befell the Tasmanian Smelting Company at Zeehan, which closed in 1909.⁵⁰ The manager of the smelter, Henry Harris, blamed the closure solely on the company's inability to secure enough ore at a reasonable price. There was sufficient silver-lead ore in Zeehan to keep the smelter operating, but a number of mines were sending their ore to Europe for smelting.

Tasmanian Tin Smelter

The Tasmanian Tin smelter in Launceston, which started in 1878, closed at the end of 1887 after producing 14,662 tons of tin.⁵¹ The closure was a result of an agreement between the Tasmanian Tin Smelting Company and the Mount Bischoff Company. The closure was said to be of mutual benefit to both companies, as it saved the cost of operating two smelters and the avoidance of competition for the limited supplies of ore from the north-east mines.⁵² The Mount Bischoff Company in return agreed to 'special arrangements' to toll smelt ore for Robert Gardner, the local manager and one of the proprietors of the Tasmanian Tin Smelting Works.⁵³ This arrangement continued to at least 1899.⁵⁴ The agreement was announced in October 1887, but the closure did not occur until the end of December. As part of the agreement George Latta, the smelting manager of the Tasmanian Tin smelter, became the smelting manager of the Mount Bischoff smelter replacing William Jenkin who had resigned the previous month, due to ill health.⁵⁵ Latta remained at the Mount Bischoff smelter until his death in 1903 aged 44 years.⁵⁶

The reasons given for the closure do not appear to be valid. There was no

50 P Howard, *The Zeehan El Dorado* (Blackmans Bay, Tasmania, 2006), pp. 88 and 90.

51 Table 3 in Appendix 3.

52 *Launceston Examiner*, 22 October 1887, p. 3.

53 *Launceston Examiner*, 22 October 1887, p. 3; Robert Gardner was not one of the original owners of the Tasmanian Tin Smelting Company and it is not known when he became an owner.

54 *Launceston Examiner*, 11 August 1899, p.3; *Launceston Examiner*, 20 December 1899, p. 2.

55 *Launceston Examiner*, 8 September 1887, p. 3

56 *Examiner*, 24 August 1903, p. 4.

decrease in the amount of tin ore produced in Tasmania in the period 1886 to 1888.⁵⁷ Hence competition for ore was unchanged. Similarly the price of tin was unchanged in this period and therefore there was no obvious increased cost pressure on the Tasmanian Tin Smelting Company.⁵⁸ The real reason for the closure appears to be the resignation of George Latta and the inability to find a suitable replacement, which is considered an external factor as it was outside the control of the company.

The smelter at the Mount Malvern Silver Mine Company in South Australia closed in 1892 in similar circumstances. In July 1892 John Webber, formerly of the Hobart tin smelter, was appointed as the foreman smelter-man to oversee the operation of a new reverberatory furnace.⁵⁹ The directors advised that Webber had considerable experience in lead smelting in England and elsewhere.⁶⁰ The furnace apparently was not suitable and Webber rebuilt it, but the 'slag would not run' and he was subsequently discharged.⁶¹ Although the furnace later produced several tons of bullion, it was shut down permanently when the company could not obtain the services of a 'competent man for the furnace'.⁶² Ironically, the experience of Webber at Mount Malvern was very similar to that of Thomas Carpenter in Hobart; both exaggerated their expertise, both built furnaces that failed and both were dismissed.

After the closure of the Tasmanian Tin smelter the Mount Bischoff smelter received the ore, from the north-east mines, that previously went to this smelter. Combining the siliceous alluvial ore with the ferruginous Mount Bischoff ore improved the metallurgical recovery of tin at the Mount Bischoff smelter.⁶³ The tin lost in the smelter slag decreased by about one-third, as the tin level in the slag decreased from 7.8 per cent to 5 per cent.⁶⁴

The closure of the Tasmanian Tin smelter was due to an external factor, which

57 Table 3 in Appendix 3.

58 Table 3 in Appendix 3.

59 *South Australian Register*, 22 July 1892, p. 3.

60 *South Australian Register*, 22 August 1892, p. 7.

61 'Nil Desperandum', 'Mount Malvern Mine', *South Australian Chronicle*, 15 October 1892, p. 5.

62 *South Australian Chronicle*, 1 April 1893, p. 22.

63 D Groves, E Martin, H Murchie and H Wellington, *Geological Survey Bulletin No. 54: A Century of Tin Mining at Mount Bischoff, 1871-1971* (Hobart, 1972), p. 152.

64 *Launceston Examiner*, 28 January 1888, p. 1S; *Launceston Examiner*, 30 July 1888, p. 3.

was confined to Australia, namely a shortage of skilled smelting managers. In contrast the external factors responsible for the closures of the Hobart and Stanhope smelters were local and international, respectively. The former was the inability to obtain sufficient ore for the Hobart smelter to remain financially viable after the failure of the Mount Heemskirk tin-field, while the latter was a decrease in the price of tin on the London market.

CONCLUSION

The Mount Bischoff Tin Mining Company built the first Tasmanian tin smelter in Launceston in 1874. It commenced operating in January 1875 and smelted ore from both the Mount Bischoff mine and other mines in Tasmania, principally the mines in north-east Tasmania. The monopoly of the Mount Bischoff smelter was soon challenged by smelters in Waratah, Hobart and another in Launceston, which were built in 1876, 1877 and 1878, respectively. Later, in 1900, a smelter was built in St Helens.

Both the Stanhope smelter in Waratah and the Anchor smelter in St Helens were built as the respective mining companies considered it cheaper to smelt their own ore, rather than have it smelted by the Mount Bischoff smelter. The decision to build the Tasmanian Tin smelter in Launceston was also based on economics, as it would save the cost of shipping the ore to Sydney, where the ore would also be shared with a number of smelters. With the construction of the smelters export of tin ore from Tasmania ceased and all the ore was value added in Tasmania to tin metal.

The Hobart smelter, which originally was owned by the Hobart Town Tin Smelting Company, was different. The smelter was built to attract business to Hobart, rather than to make a profit, according to the *Mercury*.¹ It had no close tin-field and there was no advantage to the tin miners to send their ore to Hobart, instead of to Launceston. The smelter depended solely on ore shipped from Georges Bay and most of this came from mines managed by Hobart businessmen. The establishment of the smelter in Hobart was an attempt to ensure that Hobart did not miss out on the mining boom, following the discovery of tin, and invoked Hobart–Launceston rivalry.

The Mount Bischoff smelter operated for fifty-five years until 1929, during which time it produced about 140,000 tons of tin metal. In comparison, the other smelters were short-lived. The Stanhope smelter operated for less than three years and produced about 400 tons of tin metal. The Hobart smelter ran for nine years, but was idle for extended periods, and made 2,694 tons of tin metal. The

¹ *Mercury*, 5 November 1879, p. 2.

Tasmanian Tin smelter in Launceston, which was the most successful of the competitor smelters, made 14,662 tons during its ten years of operation. In this period the Mount Bischoff smelter produced 22,036 tons of tin. The Anchor smelter was the least successful, producing only 124 tons of tin and closing after less than six months.

The Mount Bischoff smelter was successful, while the other smelters failed, for three main reasons. First, it had its own mine, which supplied the majority of the ore smelted. Second, it was much closer to the ports of Boobyalla and Bridport, which shipped most of the ore from the north-east tin-fields, than was Hobart. Georges Bay—the other port—was equidistant, by sea, from Hobart and Launceston and shipped ore to both Hobart and Launceston. Third, it had competent smelting managers in William Jenkin and George Latta. In comparison Thomas Carpenter the first smelting manager at the Hobart smelter was incompetent and his furnaces soon failed.

The Stanhope and Tasmanian smelters closed because of external factors that were beyond the control of either smelter. The decrease in the tin price, on the London market, in 1878 resulted in the closure of the Stanhope smelter and later its mine. The Tasmanian smelter closed when it could not find a smelting manager to replace George Latta, who relocated to the Mount Bischoff smelter. This was attributed to a shortage of skilled smelter-men in Australia. The Anchor smelter failed solely due to an internal factor; in that the Anchor Tin Mine Company built the smelter in anticipation of an increase in ore production from its mine, which failed to eventuate.

The Hobart smelter was again different. It failed for both internal and external reasons and could have survived either one, but not both. The internal reason occurred first and was the mismanagement by the directors and the paid staff of the Hobart Town Tin Smelting Company. This resulted in the failure of the original furnaces and the loss of tin on two separate occasions, which ultimately resulted in the company being wound up. The *Mercury* considered that the company's management had been 'so faulty as to reflect on the business capacity

of the city'.² The smelter was sold, after being closed for one year, to Richard Butler, but was unsuccessful in attracting sufficient ore to Hobart to be financially viable. It was then sold to a group of businessmen, who had interests in the Mount Heemskirk tin-field. The failure of this field—an external factor—led to the permanent closure of the Hobart smelter.

This thesis has shown that the tin smelters required good management, competent smelting managers and an adequate supply of tin ore to succeed. The smelters were also part of a wider economic community than just Tasmania and were dependent on conditions in the rest of Australia and in the then British empire. Hence they were part of the global economy. These factors for success are as important today as they were in the nineteenth century.

2 *Mercury*, 5 November 1879, p. 2.

APPENDIX 1 – DESCRIPTION OF THE TIN SMELTING PROCESS

The process used at the Mount Bischoff smelter for smelting the tin ore was described by George Latta as follows:

The furnaces used are of the reverberatory type, the draught being supplied by a chimney. A charge is made by mixing 50 cwt. [hundredweight or 112 pounds] of the various ores with about 10 cwt. of small coal; this is thrown into a hot furnace and the doors carefully closed to exclude air. The time taken to completely reduce the charge is eight hours, during which time it is subjected to several rabblings or mixings. When properly smelted the metal sinks to the bottom of the furnace, and the slags or impurities float on the top; the metal is then tapped into a float or brick-lined vessel and allowed to cool for some time, and the slags are skimmed out and reserved for further treatment; another charge is thrown in, and the operation repeated. The metal in the float is ladled into a large kettle, where it is refined by sinking billets of green wood under the surface; the heat of the metal converts the moisture or sap of the wood into steam, and causes the contents of the kettle to be violently agitated; this has the effect of releasing any entangled portions of oxide or dross, which float to the surface and are skimmed off. Samples are taken at various times, and, when sufficiently refined, the metal is ladled into moulds. This metal assays 99.80 per cent.

The slags from the ore vary in richness, according to the quality of the ores smelted and the workings of the furnace. These slags are broken up and mixed with small coal and lime and again smelted, the metal produced from them being very impure from the large amount of iron present. The iron is got rid of by smelting with the next charge of ore. ...

Metal is sent from the works in the form of ingots, weighing 75 lbs.: this is for shipment to England. Smaller ingots are also made for

consumption in the colonies.¹

All the Tasmanian smelters used similar technology. Four of the smelters used coal for heating the furnaces and for mixing with the charge, whereas the Stanhope smelter used wood for heating and charcoal for mixing with the charge.

¹ G Latta, 'The Smelting of Tin Ore at the Mount Bischoff Tin Smelting Work, Launceston', *Report of the Secretary for Mines for 1899-1900* (Hobart, 1900), p. 36.

APPENDIX 2 – SHAREHOLDERS IN THE HOBART TOWN TIN SMELTING COMPANY

A list of shareholders in the Hobart Town Tin Smelting Company at 13 March 1879 is provided in Table 1.²

Table 1

Shareholders in the Hobart Town Tin Smelting Company

Surname	Given Name	Occupation	Number of shares
Addison	John	Gentleman	20
Albert Tin Mining Co		Tin mining company	20
Bailey	Henry	Photographer	10
Burgess	William	Grocer	5
Butler	Alfred	Gentleman	10
Butler	Richard	Solicitor	24
Clark	John	Iron monger	6
Crosby	Richard	Merchant	10
Crowther	Edward	Doctor of medicine	10
Currie	Edward	Licensed victualler	22
Davies	John and Charles	Printers	50
Elliot	George	Tanner	10
Foote	Frederick	Gentleman	10
Hall	Robert	Master mariner	20
Hammett	Samuel	Schoolmaster	20
Hammond	William	Merchant	30
Harbottle	Charles	Painter	8
Howard	Thomas	Licensed victualler	20
Ireland	Alexander	Schoolmaster	10
Knight	Charles	Fruit merchant	260
Knight	William	Merchant	5

2 Tasmanian Archive and Heritage Office SC323/1/23 – Company 41 Hobart Town Tin Smelting Company.

Surname	Given Name	Occupation	Number of shares
Lewald	Dagobert	Assayer	10
Lord	James	Gentleman	50
McArdell	Philip	Gentleman	10
McMeckan	James	Gentleman	10
McRorie	Charles	Gentleman	20
Marsh	Henry	Ironmonger	25
Miller	Andrew	Chemist	10
Montgomerie	William	Dealer	60
Page	Grace	Widow	20
Page	Samuel	Deceased	10
Perkins	John	Merchant	60
Proctor	Thomas	Tanner	10
Reynolds	Thomas	Builder	4
Robinson	E	Clerk	4
Snowden	Robert	Draper	20
Urquhart	William	Gentleman	2
Webber	John	Smelter	20
Whitesides	William	Upholsterer	20
Wright	Isaac	Merchant	10

Another listing of shareholders, dated 12 March 1880, is identical except that the occupations of Hammett and Ireland were given as teacher, instead of schoolmaster.

APPENDIX 3 – PRODUCTION DATA FOR TIN ORE AND TIN METAL

Tin exports from Tasmania from 1873 to 1901 are given in Table 2 together with the value of the exported tin.³ The table also includes the calculated value of the exported tin per ton of contained tin, together with the high and low tin prices on the London market.⁴ The good correlation between the value of the exported tin per ton of tin and the London tin price is as expected, since tin was an internationally traded metal and the price paid for Tasmanian tin was determined by the price on the London market.

Table 2
Tin Exports from Tasmania and the Tin Price

Year	Exports (tons)			Value of exports		Tin price on the London Market	
	Slag	Ore	Metal	Total	Per ton of tin	High	Low
1873		4		£220		£148	£114
1874		142		£7,318		£121	£87
1875		0	366	£31,325	£86	£96	£76
1876		544	1,072	£99,606	£69	£81	£70
1877		3,526	2,221	£296,941	£63	£76	£64
1878	110	1,691	4,146	£316,311	£59	£66	£53
1879	172	75	4,316	£303,203	£69	£96	£59
1880		3	3,951	£341,736	£86	£101	£68
1881		4	4,120	£375,775	£91	£110	£86
1882		81	3,589	£361,046	£99	£114	£92
1883		77	4,045	£376,446	£92	£99	£83
1884		32	3,675	£301,423	£82	£87	£73
1885			4,242	£357,587	£84	£97	£74
1886			3,776	£363,364	£96	£103	£97

3 R Johnston, *Systematic Account of the Geology of Tasmania* (Hobart, 1888), p. 31 for years 1873 to 1884 and *Report of the Secretary for Mines for 1901-1902* (Hobart, 1902), p. xiv for the subsequent years.

4 S Fawns, *Tin Deposits of the World, with a Chapter on Tin Smelting* 2nd edition (London, 1907), p. 268.

Year	Exports (tons)			Value of exports		Tin price on the London Market	
	Slag	Ore	Metal	Total	Per ton of tin	High	Low
1887			3,608	£409,853	£114	£167	£100
1888			3,775	£426,321	£113	£170	£75
1889			3,764	£344,941	£92	£100	£88
1890			3,209	£296,368	£92	£104	£88
1891			3,235	£291,715	£90	£94	£89
1892			3,174	£290,083	£91	£103	£88
1893			3,129	£260,219	£83	£95	£74
1894			2,934	£198,298	£68	£74	£61
1895			2,727	£167,461	£61	£69	£59
1896			2,700	£159,036	£59	£62	£56
1897			2,424	£149,994	£62	£63	£59
1898			1,972	£142,046	£72	£87	£63
1899			2,239	£278,323	£124	£150	£92
1900			2,029	£269,833	£133	£152	£108
1901			1,790	£212,542	£119	£132	£101

The production data for tin ore and tin metal are presented in Table 3, together with the production for each smelter.

Table 3
Tasmanian Production of Tin Ore and Tin Metal

Year	Ore (tons)	Total Tin Production (tons)	Tin Production by Smelter (tons)			
			Hobart	Mt Bischoff	Tasmanian Tin	Stanhope
1875	608	426		426		
1876	1,972	1,235	0	1,135		100
1877	2,989	2,277	350	1,724	0	203
1878	6,193	4,440	646	2,411	1,293	90
1879	5,791	4,162	482	2,656	1,025	

Year	Ore (tons)	Total Tin Production (tons)	Tin Production by Smelter (tons)			
			Hobart	Mt Bischoff	Tasmanian Tin	Stanhope
1880	5,844	4,154	104	2,300	1,750	
1881	5,224	4,012	371	2,226	1,415	
1882	5,330	3,725	257	2,079	1,389	
1883	6,010	3,475	156	2,191	1,128	
1884	5,527	3,917	228	2,163	1,526	
1885	5,461	3,902	100	2,080	1,722	
1886	5,728	3,578	0	1,965	1,801	
1887	5,702	3,578		1,965	1,613	
1888	5,245	3,662		3,662	0	
1889	5,550	3,761		3,761		
1890	4,713	3,318		3,318		
1891	4,322	3,195		3,195		
1892	4,463	3,252		3,252		
1893	4,706	3,120		3,120		
1894	4,284	2,956		2,956		
1895	3,865	2,723		2,723		
1896	3,806	2,686		2,686		
1897	3,239	2,435		2,435		
1898	2,837	1,978		1,978		Anchor
1899	3,281	2,238		2,238		
1900	2,650	2,058		1,996		62
1901	2,476	1,799		1,737		62

The production information in Table 3 was collected from a number of sources. First, the tons of ore produced were from the annual *Statistics of the Colony of Tasmania* for 1875 to 1900 and the *Statistics of the State of Tasmania for the year 1901*. Second, the total metal production tons for 1875 and 1876 were from the *Launceston Examiner*.⁵ The data for the total metal production for the

⁵ *Launceston Examiner*, 7 August 1875, p. 2; *Launceston Examiner*, 15 January 1876, p. 2; *Launceston Examiner*, 4 January 1877, p. 2.

subsequent years were from the *Statistics of the Colony of Tasmania* for 1877 to 1901 and the *Statistics of the State of Tasmania for the year 1900*. Third, the production data for the Hobart smelter were from the *Statistics of the Colony of Tasmania* for the years 1887 to 1885. Fourth, the production data for the Mount Bischoff smelter from 1875 to 1890 were from the half-yearly reports of the Mount Bischoff Company in the *Launceston Examiner*, usually in the last weeks of January and July. From 1890 to 1899 the Mount Bischoff production data were from the annual *Statistics of the Colony of Tasmania*. For both 1900 and 1901 the production data for the Mount Bischoff smelter were calculated from the total tin production less 124 tons produced by the Anchor smelter, which was assumed to be split equally between 1900 and 1901. Fifth, the production data for the Tasmanian Tin smelter in Launceston for 1878 and 1879 were from the *Statistics of the Colony of Tasmania*. In the period 1880–1887 the production was calculated from the production data for Launceston in the *Statistics of the Colony of Tasmania* less the production at the Mount Bischoff smelter. Sixth, the production data for the Stanhope smelter for 1876 was calculated from the total tin production less the tin produced at the Mount Bischoff smelter. The *Statistics of the Colony of Tasmania for the year 1877* indicated that 119 tons of tin were produced at Mount Bischoff, which was assumed to be from the Stanhope smelter. The *Statistics of the Colony of Tasmania for the year 1877* also reported that 1,808 tons of tin were produced in Launceston, whereas the Mount Bischoff Company reported a production of 1,724 tons. The difference of 84 tons was assumed to be from the Stanhope smelter making a total of 203 tons produced in 1877. For 1878 the production at the Stanhope smelter was calculated from the total tin produced less that from the other smelters as given in the *Statistics of the Colony of Tasmania for the year 1878*.

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