

The Aldershot Smelter, Queensland

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Until the 1880s Queensland mining companies traditionally established smelters very close to their mines, but from that time the establishment of a central smelters beside a deep-water port to treat ores for all Queensland base metal mines was pursued. Overseas countries such as the United Kingdom and the United States had major central smelters such as those at Swansea and Anaconda, and with very strong British interest in investment in Australian mining in the 1880s, it was decided to establish a central smelter in Queensland. This paper analyses the lifespan of the smelter which commenced with high hopes, overseas investment and a highly regarded management, but which ended when its viability collapsed early in the twentieth century. Also addressed are the reasons for the choice of Aldershot near Maryborough as the smelter site.

There had been a copper smelter in Queensland at Peak Downs from November 1864 to 1877¹ and at Mount Perry from 1872 to 1911.² The rich ore at Mount Morgan had been discovered in 1882 and the Mount Morgan company was mining the gold, but not the copper.³ A bill for a proposed transcontinental railway from the Darling Downs to Wyndham on Cambridge Gulf in Western Australia via Cloncurry, which would have developed that region's copper deposits, had been defeated in the Queensland Parliament in 1883.⁴ There was a very short-lived copper smelter at Cloncurry in 1885.⁵ Irvinebank Mining Company commenced its very successful tin smelter at Irvinebank on 10 December 1884,⁶ and the Mount Albion Silver Mining Company opened its silver smelter six miles west of Irvinebank in September 1886.⁷ Therefore, prospective international investors interested in refining Queensland's base metals, turned their attention to having a smelter at a deep-water port that had access to coal supplies. Such a port would save high transport costs, and Queensland ores would not need to be exported to Swansea in Wales or Freiberg in Germany. There were extensive coal resources at Howard and Torbanlea so they believed Maryborough was a good choice.

Maryborough flourished as a port for the Gympie goldfield from its discovery in 1867 and expanded when John Walker and Thomas Braddock, engineers of Ballarat, established the Union Foundry (later Walkers Limited) there in 1868 to service the goldfield and burgeoning sugar industry in the Maryborough district.⁸ Maryborough businessmen had been promoting the idea of a regional smelter since the copper boom of the late 1860s, while following numerous discoveries of lead and copper in the region, the *Maryborough Chronicle* newspaper promoted the idea in 1869.⁹ Two smelters had been developed in the Black Snake Range south of Kilkivan, west of Gympie, in the early 1870s - Mount Clara (two furnaces) from 1873 to 1875,¹⁰ and Mount Coora (seven furnaces) from 1872 to 1875.¹¹ Mount Clara Copper Mining Company, with £40,000 nominal capital, was financed by Maryborough businessmen including William Southerden,

George Horsburgh and Thomas Braddock,¹² Mount Coora Copper Mining Company was the larger venture with £75,000 nominal capital. The investors included two New South Wales Cabinet Ministers, G.A. Lloyd and G.W. Allen, both businessmen and Allen was the founding solicitor of Allens.¹³ The Mount Coora Company was a private company in Sydney, chaired by L.E. Threkeld, son-in-law of G.A. Lloyd,¹⁴ and it took over the Mount Clara mine in May 1875.¹⁵

In the late 1880s, to overcome the lack of smelting facilities in Queensland for a range of base metals, a British company decided to construct a smelter to treat auriferous sulphide ores and base metal concentrates from Queensland mines. The decision evolved out of prudent property purchases in the Maryborough region by the wealthy and influential Clayton family, funded by British capital. This view is supported by strong evidence of private purchases of land near Maryborough by the company proponents, although Maryborough itself had no base metal deposits in close proximity. These purchases determined the smelter location, 11 miles north of Maryborough and 171 miles north of Brisbane in southern Queensland.¹⁶ The second strong reason for the construction of a smelter near Maryborough was the extensive coal deposits nearby at Howard and Torbanlea to use as fuel.

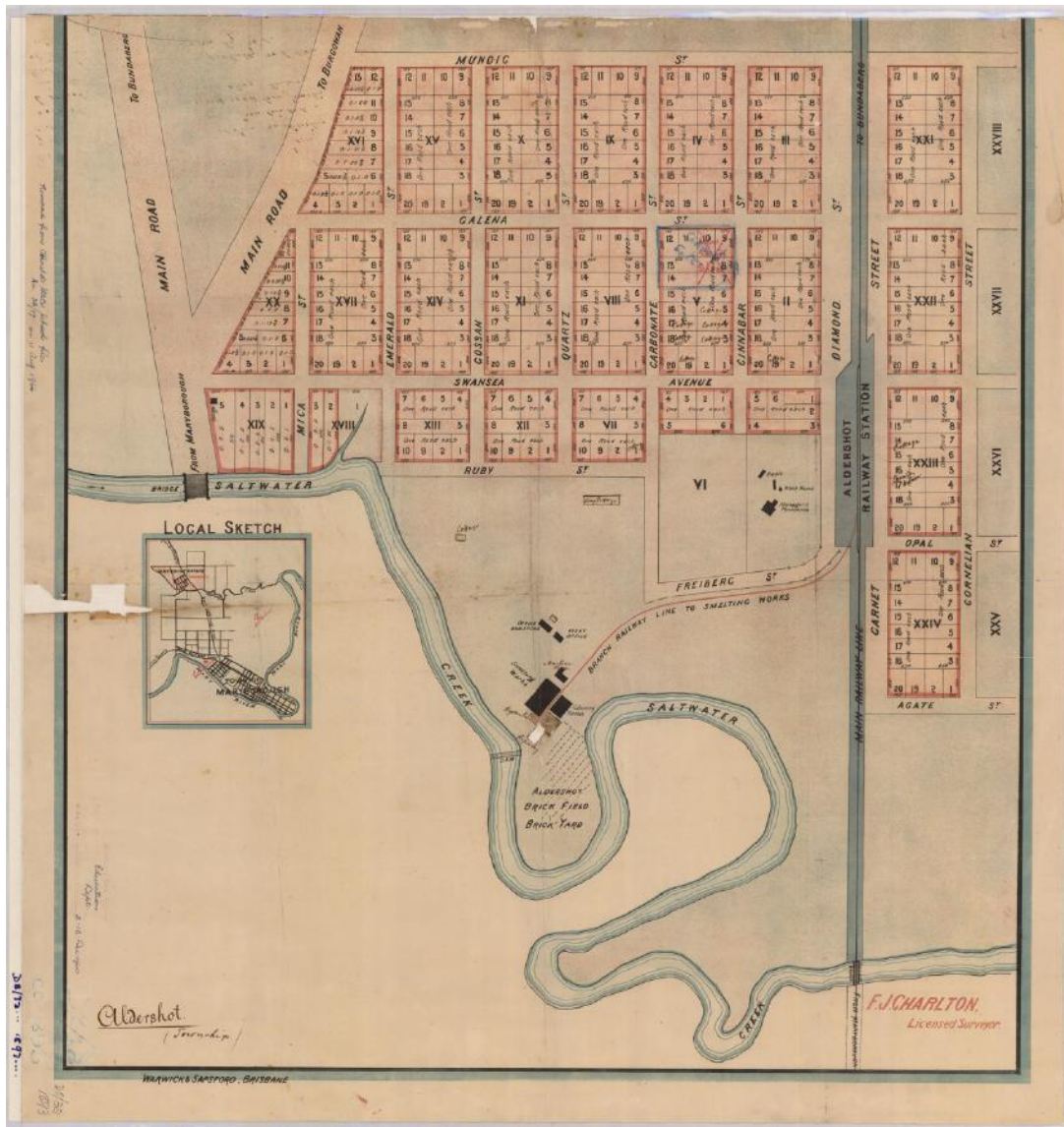
In 1882 a square mile of land with stockyard and cottage at Aldershot, 6 miles from Maryborough, was advertised for rent by one of the region's leading landholders, Dan McTaggart of Kilkivan,¹⁷ and soon after, in September 1883, a brick and tile works was established by Clayton and Company at Aldershot.¹⁸ In March 1884 the proponents invited James R.M. Robertson,¹⁹ a leading mining engineer, coal mine owner and company promoter from Mount Kembla, New South Wales, to inspect and advise on the nearby coal measures; this was the only time he ever visited Queensland coal mines. Described as 'the eminent geologist, whose close connection with this colony has largely aided progress', he visited Maryborough after two years absence, to evaluate whether the Burrum coal fields in the Howard - Torbanlea area could provide a suitable fuel for a smelter at Aldershot.²⁰ In 1885 the topic of building a smelter was raised again as a possible justification for construction of the Urangan Railway to join the main line at 11 miles from Maryborough.²¹ The enveloping boom in British capital investment in Australia from 1886, along with the development of new mines in the area, added more support for smelters to be constructed near the Burrum coalfields. These would treat auriferous ores from around Australia using the chlorination method similar to that method used at Mount Morgan.²²

On 22 September 1887, Walter Adams MLA, Member for Mulgrave which encompassed the Bundaberg area, moved in the Queensland Parliament that £50,000 be placed on the Estimates for the erection of smelters to treat auriferous sulphide ores in Queensland instead of sending them to Germany or England for treatment. He saw it as an opportunity for the Government to stimulate private enterprise development using British capital in the Bundaberg area;²³ a scheme also supported by the Bundaberg Chamber of Commerce. D.F. Johnston of *Kolan* station had presented a paper on the Bundaberg region's resources and opportunities to the Bundaberg Chamber of Commerce, based on a paper by Robert L. Nash, author of *The Australasian Joint Stock Companies Year Book*, presented on 5th July 1887 at the Colonial and Indian Exhibition. This reported that

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Queensland's exports of between £15 and £16 per head of population were the largest in the world and compared them with the United Kingdom's figures of £6 to £7 per head. Nash had also stated that in 1884 Queensland's gold reefs yielded as free gold per ton of quartz nearly four times as much as Victoria, almost 2.5 times New South Wales production and double New Zealand production. In 1886, at the Colonial and Indian Exhibition, the Queensland government exhibited a trophy 21 feet high with a volume of 332 cubic feet representing the 4,846,560 ounces of gold valued at £17,623,284, produced in Queensland since 1861.²⁴ Johnston advocated that the smelters suggested by Walter Adams should treat the mineral resources of the Bundaberg region as there were numerous mines in the area that were lying idle: in particular Gigoomgan, Teebar, Biggenden, Mount Shamrock, Cania and Reid's Creek near Eidsvold. The Hon. J.M. Macrossan MLA saw Johnston's advocacy as an opportunity to utilize German scientific skills and Premier Griffith suggested that the German government smelting works at Freiberg could be a model to copy.²⁵

Figure 1: Map of Town of Aldershot 1893.



Source: ID 623516, Queensland State Archives.

Local people considered that the ownership of land in the Aldershot and Maryborough areas by Reginald Byard Buchanan Clayton, one of the directors of Queensland Smelting Company, was the strongest reason for selection of that area as a smelter site in 1888. On 9 July 1881, describing himself as 36 years old and living in Maryborough, Clayton had purchased Selection 1054 in the Parish of Broomfield from selector, Stephen Charles Broom.²⁶ He progressively bought much more land in the Parishes of Ferguson, Tinana, Vernon and Walsh in 1882–1883, giving his address as *Alpha* sugar plantation.²⁷

The Queensland Smelting Company selected the smelter site on Saltwater Creek at Aldershot north of Maryborough on the Maryborough–Bundaberg Railway in 1888. The land on which the smelter was constructed was Portion 58, of 665 acres in the Parish of Walliebum, County of Lennox. It had been selected under the *Crown Lands Alienation Act 1868* on 20 November 1876 by John Appel.²⁸ This property was transferred to Hugh Monckton on 29 May 1882 and on 6 September 1882 was designated as freehold.²⁹ By the time the company was being incorporated Clayton held two-thirds ownership of this land, to be used as location of the smelter.³⁰ This local opinion about land ownership was vindicated when a prospectus for the Queensland Smelting Company Limited was published in London in early July 1888.³¹ The driving forces behind the company were Reginald B.B. Clayton and Sidney S Clayton. An agreement was signed on 13 July 1888 between Reginald B.B. Clayton and Coultas Price Almond on behalf of the company for the formation of the company.³² The directors were Major-General the Hon William Henry A. Fielding, James Henry Mace and John Nickisson. The company was incorporated in London on 27 July 1888 and registered on 22 October 1888 in Brisbane with its office at Flower and Hart, Solicitors, at 150 Queen Street, while N.M. Rothschild and Sons were the company's 'financial agents and bullion buyers in London'. The company's capital was £80,000 in £1 shares.³³ The principal metallurgical reason for the formation of the company was to be a central smelters complex treating silver-lead ores from Bowen area, Herberton, Irvinebank, Montalbion six miles west of Irvinebank, Muldiva, Chillagoe, and other north Queensland localities and mines of the Burnett region. Reginald Clayton (using the address, 85 Edith Road, Kensington) was also a subscriber to the Mount Albion Silver Mining and Smelting Company formed in 1888 in London and he subsequently held one share only.³⁴ Clayton would have known that the Montalbion silver smelter was struggling with the local metallurgy. Chillagoe was a fledgling field and Clayton no doubt hoped to treat the field's ores before a large company was formed to take over and smelt the ores on the field. So, the Maryborough regional option with its coal supplies looked very attractive for smelting Queensland ores.

The first statutory meeting of the company was held at Clayton and Rawson's office at 83 Bishopgate Street, London on 9 November 1888.³⁵ Ernest Albert Weinberg from the United States, who had trained at Frieberg in Germany, was appointed General Manager. After several minor appointments in the United States, Weinberg had joined the largest mining firm in the United States, Haggan and Lewis, and was then appointed manager of the Anaconda works, the largest in the Americas. After some years he returned to Germany and subsequently accepted a position at the Carlisle Gold Mining Company's smelters. He left that company to come to Queensland, but he had already made his

world-wide reputation at Anaconda.³⁶

The perceived advantage for the company was its proximity to the Burrum coalfield, and it planned to bore for coal immediately. A dam was built, and a branch railway from Aldershot railway station into the smelting works was surveyed and constructed. The perceived advantage for the company was its proximity to the Burrum coalfield, and it planned to bore for coal immediately. The perceived advantage for the company was its proximity to the Burrum coalfield, and it planned to bore for coal immediately. A dam was built, and a branch railway from Aldershot railway station into the

Figure 2: *E.A. Weinberg.*



Source: State Library of Queensland – IE387367_FL387794_jpg.jpg

smelting works was surveyed and constructed. The smelter was erected during 1889 on the western side of the Burrum railway line beside Saltwater Creek, and above tidal water. The machinery had already been purchased in 1888 from Sydney and Fraser and Chalmers of Chicagounder the supervision of the firm, Newberry and Vautin.³⁷ The two main large white galvanized iron buildings housed the assay office, blacksmith shop, machine shop and laboratory. The largest one of these buildings was 140 X 70 feet.³⁸ Bricks for the furnaces were made locally. and a local supplier provided the bricks for the furnaces and chimneys that rose 70 feet high. The machinery comprised Blake and Dodge crushers, Huntingdon mill, Frue Vanners, and both reverberatory and water jacket furnaces, while sufficient blast was to be provided by two Roots

Blowers, each with a separate driving engine. About 40 men erected the smelters and the workforce was expected to total 60 when the plant was operating. The permanent staff included the Managing Director, Francis Gill, a former Mining Warden in Queensland, Manager Fishborne, engineer McPherson, clerk Osborne, and E.A. Weinberg. The latter had a fine house constructed for him and received a salary higher than that of the Premier of Queensland. The total cost of the Aldershot works had been approximately £45,000. The 28 chains siding into the smelters was constructed in February 1889 and financed separately in association with Queensland Railways.³⁹

The large furnaces were each capable of treating 1,500 tons of ore per month and the small cupola furnace could treat 450 tons., and on average the company put through 50 tons of ore to 80 tons of charge in 24 hours. The technical and metallurgical processes used in the Aldershot smelter were described by J. Malcolm Maclaren in his 1901 *Report on Queensland Mining Practice* using information provided by Sheddan T. Burgh, the company's metallurgist:

All ores on arrival at the works are divided into two classes - (a) those which may be immediately sampled, and (b) those which require a preliminary crushing. Of the first class are concentrates and slimes, and of the second are all coarse ores. The latter are crushed through two breakers 'in tandem', the coarse crusher being a

large Blake-Marsden, and the fine crusher a smaller machine of the Dodge type. From the latter the ore passes through a pair of rolls set to crush 3/16th inch. After sampling, the 'parcels' are binned according to their value and chemical composition as determined by the Assay Office. Such ores as require roasting, preliminary to smelting, are roasted in reverberatory furnaces of the ordinary type, with three hearts and capable of roasting 8 tons of heavily mineralised ore per day. To permit of subsequent handling, the roasted ore is trucked to the roast-yard and there cooled. From the roast-yard it is conveyed to the feed-floor of a large blast-furnace, and there fed in with the necessary charge of coke and fluxes. This furnace is 36 by 100 inches at the level of the tuyeres, and has a daily capacity of about 80 tons. It is furnished with wrought-iron water-jackets and a brick shaft, and is used mainly for smelting gold and silver lead ores. A smaller circular water-jacketed wrought-iron furnace, of a capacity of 30 tons per day and a diameter of 36 inches at the tuyeres, is chiefly used for the re-treatment of by-products and for the smelting of copper ores. The total capacity of the works is about 65 to 70 tons of ore per day, the remainder of the total furnace capacity being absorbed by fluxes and fuel.

In the smelting of auriferous and argentiferous galena and pyrites three products are sought for - a lead bullion carrying all the gold and most of the silver; a low grade matte, with proportionately small quantities of copper, silver, and lead and finally a worthless (in Queensland) slag, which is thrown over the dump. The low-grade matte is re-smelted, and the resultant lead bullion, containing gold and silver, is refined by several processes, the products being soft marketable lead, silver and doré bullion. The first operation in the refining of base lead bullion is the 'softening', or calcination process, carried out in a reverberatory furnace of a capacity of 30 tons. Here, by exposure to an oxidizing flame, the lead is calcined to remove foreign substances, the copper, zinc, iron, and antimony rising to the top of the molten lead as a pasty dross, which may be raked off, to be afterwards re-treated. From the 'softening' furnace the lead is run to the 'zincing' kettles, where it is desilverised by Parkes's process, which depends on the fact that when argentiferous lead and zinc are melted together and allowed to cool, the zinc alloys with a certain proportion of the lead, solidifying on the surface and collecting at the same time the greater proportion of the silver originally scattered throughout the molten mass. If this alloy, therefore, be skimmed off, the resultant 'zinc crusts', will contain nearly all the silver. The proportion of zinc necessary depends on the richness of the lead bullion, from 20 to 100 ozs of silver requiring 1.5 per cent to 2 per cent of zinc. The lead remaining after skimming the 'zinc crusts', however, contains a little zinc which must be removed in the 'refinery furnace' - a reverberatory of 15 tons capacity - by exposing the lead for some time at a red heat. The 'refined' lead is deprived of its gold by cupellation in English cupel furnaces, which, by the assistance of an air blast, oxidize the molten lead to litharge, leaving the doré bullion on the hearth. The litharge [*sic*] is reduced to soft 'marketable lead' as may be convenient. The 'zinc crusts', mentioned above, are purified by distillation in tilting furnaces, the zinc being received in suitable condensers, and the lead and silver left behind for further treatment.

In addition to the smelters a compact milling and cyanide plant is attached to the works. The former consists of a 5-foot Huntindgon mill and copper plates of the same type as that described as being worked at the Brilliant and St George Mill. Concentration is effected, to the best of the writer's belief, by the only two Frue vanners in operation in a gold mill in Queensland. The cyanide plant was erected to treat a heap of tailings already on the ground, but afterwards found to be too poor to work at a profit. This auxiliary milling plant has been of considerable service to the management in advising mineowners as to the suitability of their ores for concentration and subsequent smelting of concentrates.⁴⁰

When the company actually commenced operating in 1890 the Queensland economy was in poor shape. The maritime strike of 1890 and the shearers' strike of 1891 fractured colonial society and the stock market fell. Commerce was severely restricted by the closure of the Queensland National Bank, the official bank to the colonial government.

At the third annual meeting of the company held in Mason's Tavern, Mason's Avenue, Basinghall Street, London in May 1891, the company resolved to increase the capital to £200,000. John Nickisson, acting chairman, foreshadowed plans to have a line of steamers plying to and from South Australia taking coal and bringing back lead ores. He also postulated a North Queensland branch to treat the complex ores that the Company were not able to handle. He hoped to see 'at a not very distant future, Swansea, as it were, raising on their freehold property at Aldershot'.⁴¹

The fourth annual meeting was held on 28 June 1892 at the Cannon Street Hotel, EC, London. The Chairman, John Nickisson, thought that the debt balance of £10,000 was very heartening. He referred to the dead time between incorporation on 14 July 1888 and the first experimental smelt on 21 August 1890. He also referred to the excellent business advice of obtaining the best practical man as the first manager -

... never mind what you pay him; all will depend on his industry, integrity and scientific knowledge and business-like habits, and the way in which he obtains the respect of the Queensland mine owners and agents.⁴²

The company's next major difficulty was the 1892 flood in the Mary River – 'one of the largest floods probably ever known in the colony and the most gigantic strike ever known in the world'. Floods stopped the ore supplies by train and this continued to be a problem.⁴³

The new 80-ton furnace was blown in on 18 March 1892 in the presence of the Queensland Premier, Sir Samuel Walker Griffith MLA. Weinberg reported it

a great success, but it is consuming the ores more quickly than I can supply them in Queensland. It will therefore be necessary to adopt some definitive steps towards extending our trade to the southern mining districts before long.⁴⁴

To overcome this the company immediately opened ore purchasing depots at Port Pirie, South Australia, Zeehan and Emu Bay (Burnie) in Tasmania, and ore agencies in Broken Hill, Thackaringa, Sydney and Strathbogie in New South Wales, as well as in Adelaide and Gippsland.

The main Queensland suppliers to the smelters were the Biggenden magnetite mine,⁴⁵ Mount Shamrock, Cania, Reid's Creek near Eidsvold, Gympie miners whose ore was unsuitable for David Reid's⁴⁶ Glasgow assaying process of refractory ores, Charters Towers, Herberton, Mackay, Paradise (north of Biggenden),⁴⁷ Mount Morgan⁴⁸ and the New Normanby Copper Company's mine in the Mount Perry district. Ore also arrived in barrels from the Old True Blue mine near Croydon. Over the whole life of the Aldershot smelters there was a multiplicity of small miners sending ore to Aldershot including Mount Cannindah, Lappa, Gurrumbah, Enoggera in Brisbane, Hillsborough ('prill' ores), Wexford, Mount Usher, Woodlark Island, Mount Orange, Mount Molloy, and Mount Morgan (gold from by-products).⁴⁹

The 2,000 tons of ore per month capacity of the smelter was greater than the rate of

ore supplies in 1892. The average cost of ore was £10 per ton and the cost of smelting in the new furnace was 30 shillings per ton compared with £2.19.6 in the old. Coke cost 34 shillings per ton, limestone 13 shillings per ton, and customers paid £3 per ton smelting charges.⁵⁰ Although the slimes in the ore were proving difficult, Chairman Nickisson felt that the company was capable of making substantial profits as the first public smelting works in Queensland, treating silver, lead, gold and copper ores. The chairman was very willing to explain away the problem of the slimes and said the cleaned-out water jacket furnaces were as good as new. Also, the company had improved the property by erecting several workmen's cottages which had an 8 per cent to 10 per cent return. For bringing a good deal of business to the company, 250 fully paid shares were voted for each of Hon A.H. Wilson MLC and Isidor Lissner MLA in Queensland, and 500 fully paid shares were voted to E.A. Weinberg for his managerial services.⁵¹

There was another debit balance for the fifth annual meeting, held in October 1893 at Winchester House, Old Broad Street, London. Circumstances had been against the company because of the economic depression and closure of mines. Chairman Nickisson, reported that £500 worth of damage had been incurred in the very serious 1893 floods when water came up to five feet deep in the smelting works. The huge fall in lead and silver prices had serious implications for the company as well as for the Queensland colony as a whole.⁵²

Company director and international mining investor, General Fielding, inspected the smelter in 1894. At the AGM that year chairman Nickisson still optimistically highlighted the encouraging results during the year, pointing out they had sold £50,000 more bullion than in the previous year. Weinberg had economised by removing the assayer and doing the work himself, and Directors' fees were abolished. The machinery upgrade costing £2,000 was also done.⁵³

Reginald B.B. Clayton presided at the seventh AGM in December 1895, where he praised the staff for economical management through such a severe depression. The cost of the southern ore agencies was still high but the London bullion agents, N.M. Rothschild and Son, were economical. Weinberg undertook very judicious buying of ore to ensure profitability. The soft lead sold well but Weinberg was still able to keep the works fully operational, but the company had sustained a huge loss following the fall in silver prices. Another downside was that both General Fielding and John Nickisson had died during the year.⁵⁴

Although the company owned 1,200 acres of freehold coal lands as one of its substantial assets, the company's mortgages and loans continued to rise, from £42,901 to £61,846 in 1896.⁵⁵ Weinberg presented a detailed report on Aldershot smelting to the sixth meeting of the Australasian Association for the Advancement of Science in 1895 in Brisbane, and also visited Britain in 1896 after having significantly reduced the deficits.⁵⁶ Chairman Clayton boasted how it was not a market oriented company constantly restructuring.

The maintenance and expansion of the Aldershot works had been paid for out of revenue and the company had received increased rents from its town cottages. The company by working its coal reserves had financed the construction of their railway siding. However, Stg£3,000 had been reserved for the gold refining plant and there was a debt of

Stg£58,448 to Rothschild and Sons. At the same time income rose Stg£24,000 to Stg£108,269. Meanwhile the Bundaberg Chamber of Commerce was still very supportive of the company and proposed that the Queensland Government should erect central smelting works elsewhere in Queensland to foster the mining industry on the same legal and business principles as it had done with the sugar industry.⁵⁷

Figure 3: *Goldfields of Queensland 1858-1899* by William Lees.



Source: National Library of Australia Digital Copy.

Throughout much of its life, the Queensland Smelting Company found it difficult to maintain the steady flow of ore to make its custom smelter consistently profitable. Queensland mining companies with the largest productions — Mount Morgan, Chillagoe and Mount Perry — each had their own private smelters and took business away from Aldershot by also treating the material of other mines nearby. At

the Queensland Royal Commission into mining in 1897, Weinberg gave detailed explanations about the operation of the smelters. He left the question as to his opinion about the location unanswered when he said that he came to Queensland in 1889 to take charge of the business, and the site had already been chosen, the buildings were partially erected, and the machinery had arrived.⁵⁸ Thus, his first task was to obtain supplies for the smelter. Having travelled all over the colony to obtain ore he could still only give a discouraging report to the directors, but they had already decided to go ahead. Weinberg had to obtain a matrix of copper and lead ores from wherever he could. The best supply was from Montalbion in north Queensland but by then the whole of the mining there was in the hands of small parties. This made it difficult to negotiate contracts for reliable supplies, and he had to obtain ore in five, 10 or 20 ton lots from many places. In fact, in eight years the company could only increase the ore supplies from 1,000 to 2,000 tons of ore from Queensland. Meanwhile the newly established works at Lake Illawarra in New South Wales were competing with Aldershot, when it could only just pay its way.

The main ores the Queensland Smelting Company bought in Queensland were concentrates freed of a portion of quartz. One of Weinberg's difficulties was that the concentrates produced elsewhere in Queensland by Brown and Stansfield concentrators consisted of 50 per cent silica and quartz. The other half composed of iron pyrites, lead sulphide, arsenical pyrites, zinc sulphide and antimony sulphide was all sampled when it arrived on the railway trucks. For quantities of more than 50 tons the smelting charges were £2 per ton. The company also crushed ore through the Cornish rollers for small miners on the Ravenswood and Charters Towers fields. Ore was further concentrated in the Huntingdon mill, and Weinberg and his staff provided metallurgical advice gratis over many years to hundreds of miners and companies on the best methods to use to locate impurities, of which bismuth was the worst. The smelters discarded tin and endeavoured not to have zinc impurities in the concentrates. Sellers could also exchange assays with the Queensland Smelting Company or send a representative to a public sampling procedure. Southerden, a Maryborough businessman, was an ore buyer retained by the banks, many miners and the Day Dawn and Wyndham Company for the purchase of ores.

All the profits of the Aldershot smelters were invested in new machinery. The Queensland Smelting Company investigated erecting a 10 head quartz crushing battery at Ravenswood but there was insufficient ore. It also investigated purchasing the Queensland National Bank's mines but these were marketed at what was considered an extortionate price. Weinberg's view was that smelters should not be established unless the proprietors could negotiate contracts with mining companies for all their ore. He had talked to all the leading miners and mill owners at Charters Towers and showed them how to produce clean concentrates rather than use the old system of grinding; but it had taken nearly eight years to convince them. He reported that he had never had any ore from the Etheridge field.⁵⁹

Weinberg went on a very significant trip to London in January 1898 and met with the Rothschilds, financial agents for the Queensland Smelting Company, to discuss obtaining finance for the extension of the Aldershot operations. Engineering companies' order books in Britain were full after the settlement of the engineers strike so he had to arrange manufacture in Australia. On his return to Brisbane in April 1898 he met with a

journalist from the *Telegraph* at Lennons Hotel and announced that he had been appointed consulting engineer to the Consolidated Mines Selection Company in Australia.⁶⁰

Weinberg resigned from Aldershot within a month to become manager of the Illawarra works at Dapto. On 30th May the management and employees of the Aldershot smelting works and townspeople gave him a farewell at the smelters. They presented him with an illuminated address created by Alf Wilmot and a banquet was held in his honour in Maryborough's *Royal Hotel*. The Mayor, O.S. McGhie, stated that when he was an employee of Queensland Railways' he advocated unsuccessfully that the smelters be sited closer to the Aldershot railway station and above flood level. He praised Weinberg for his metallurgical skill and thanked him for organizing ore supplies to the smelters by visiting mines all over Queensland. Weinberg was presented with a 108 ounces silver salver which had been beautifully chased. In expressing his thanks Weinberg described how on arrival as manager of the smelters nine years earlier he was not confident of success, and that he was now the largest shareholder in the Queensland Smelting Company. He noted how the works were now on a sure footing financially, that he had received strong support from the company directors, and the Queensland economy was improving.⁶¹

G.V.S. Dunn, Broken Hill-trained Queensland Smelting Company's Melbourne manager for eight years, and T.I. Dyson, formerly manager of Mount Morgan and of the Northern Territory Mines of Australia Limited, became managers after Weinberg left and W.H. Clark became the accountant.⁶²

In September 1898 the Queensland Smelting Company Limited went into liquidation. A new Queensland Smelting Company was formed and registered on 3 January 1899 with a nominal capital of £50,000 divided into £1 shares.⁶³

After the Chillagoe smelters were established in 1901 one of Aldershot's main supplies was cut off. The Queensland Smelting Company was then only able to operate the works by arranging to purchase ores from Ravenswood miners and elsewhere in the state – 504 tons in 1901, 812 tons in 1902, 2,780 tons in 1903, 2,040 tons in 1904, and 1,515 tons in 1905.⁶⁴ In fact the Queensland Smelting Company had been highly influential in the formation of the New Ravenswood Limited in March 1899,⁶⁵ and subsequently the company sent its mundic ore to be processed at Aldershot exclusively between 1899 and early 1906. When Ravenswood ores declined, the Queensland Smelting Company had to buy Charters Towers ores in competition with Cockle Creek near Newcastle and other southern smelters, causing them to spend large sums of money to alter their machinery to treat the ores. In 1903 a new Cornish boiler with Galwey tubes and 150 pounds pressure was ordered from Walkers Limited of Maryborough, a new sampling house was erected, and the assay office expanded. The assay office was re-equipped as well as the balance room and metallurgical rooms with an Oertling assay and analytical balance.⁶⁶ Some of the newest American sampling machines were added. The smithy was enlarged, and a new carpenter's shop was erected, while the main chimney was lengthened by 11 feet, reaching a height of 80 feet. The copper smelting furnace was overhauled and fitted with a cast iron outer hearth to hold four to 10 tons of matte; the 80 tons blasting furnace was entirely rebuilt, including a new shaft, and a complete set of water jackets supplied by Walkers Limited. Three calcining furnaces were added, an ore-receiving shed to hold 1,000 tons of ore was constructed, and an automatic train operated to feed ore into the furnaces.⁶⁷

An additional furnace was added in 1905, although by then it was public knowledge in the industry that manager, Eric E. Watson, had some of the most difficult metallurgical problems in Australia.⁶⁸ Nevertheless, by treating more ore in a month than Weinberg treated in 12 months Watson demonstrated the public confidence in the smelters.⁶⁹

By 1906 the smelters were unprofitable. Operations ceased in March, and the debenture holders took possession on 7 April 1908, disposing of saleable buildings.⁷⁰ Previous to this, efforts were made in 1907 to reopen the smelters by buying a controlling interest in Broken Hill Pinnacles Limited as a supply source. The Queensland Smelting Company Limited proposed the erection of a new concentrating mill process.⁷¹ However the plan did not proceed, and the smelters remained closed even though overtures were made to the state government in 1908 to take them over.⁷²

In his Report on 25 April 1910 on the proposal to purchase the Aldershot Smelting Works, C.F.V. Jackson, Chief Inspector of Mines, stated that the smelters were primarily a lead smelting works with equipment for calcination of lead-silver ores and concentrates, lead blast furnace, lead softening and refining plant, and cupelling furnaces used for recovering any gold and silver contained in the above ores. There was also a small circular copper furnace for copper recovery, and a small amalgamating and concentrating plant for testing gold ores. He assessed three main problems: the position of the smelters, six miles from a trans-shipping port; the lack of a sufficient lead supply and; the fact that there were then scarcely any lead ores in Queensland requiring public smelting works. He expressed the predicament succinctly:

... the works are situated in the wrong place for a custom smelter i.e. for a smelter having no ore source such as a mine to rely upon for its ore supplies. In the first place the District and Port would appear to be wrong for economic reasons, or if the District and Port were right, then the works were improperly placed six miles from port instead of being right on the river bank; consequently all ores had to be landed at port, handled and railed to smelters; and then resulting products handled and railed back to the port for shipment abroad.⁷³

Although close to a coalfield, the cost of coal was still higher than that in New South Wales. By comparison Cockle Creek smelter near Newcastle had its own supply mine and could handle five or six times the quantity of ore that Aldershot could.

Jackson reported that the enterprise could not pay under either private or public ownership and 'they are not of very much importance in the development of the industry'. He thought that the amalgamating and concentrating plants for gold ores were old and not of much value, and the lead smelting works were worse than useless. He confirmed that by 1910 it was an accepted principle that an establishment like Aldershot smelting works could not exist in Australia without being situated beside an operating mine to supply it.⁷⁴

Local businessmen advocated that the operation of the smelter would encourage mineral prospecting in Queensland and the development of new mines. It could also treat trial parcels of ore from around Queensland. A further opportunity contemplated was the teaching of mineralogy to technical college students.⁷⁵

In March 1910, tenders were called through Pryce and Netterfield, auctioneers of Maryborough, for the removal of the Aldershot smelting works.⁷⁶ Flour miller, Dominion

Milling Company bought the old chimney at Aldershot some time before March 1920. The company felled it and used the bricks for a chimney and retaining wall at their mill in Kent Street, Maryborough in 1920.⁷⁷ The points of the 28 chains long Aldershot Smelting Works railway siding were taken up in 1920 and the Gatekeeper position was removed from there from 1 April 1921.⁷⁸ Since then the smelter foundations and building ruins have decayed. On a visit on 4 September 1985, Don Chaput of the Los Angeles Natural History Museum reported seeing an 80 feet slag dump beside the creek, foundations of miscellaneous buildings and the railway formation. Subsequent visits by the author indicated that the land is overgrown and fenced off. The abandoned Aldershot township was rejuvenated in the 1970s and allotments sold to newcomers.

The whole Aldershot development had little chance of success because of its isolation from large base metal mines and low cost of production coal mines. The development is indicative of overseas investment without sufficient local knowledge of Australian resources, transport infrastructure and services. The investment shows that even with some of the best North American technical input, the enterprise could not succeed when sited inappropriately on land that the directors had purchased beforehand and then sold into the company in formation.

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Units used in this paper:

1 inch = 25.4 mm, 1 foot = 0.3048 m, 1 mile = 1.609 km, 1 chain = 20.12 metres.
1 troy oz (the standard measure of gold and silver) = 20 dwt = 31.10348 g;
1 pound (lb) = 0.454 kg, 1 ton (long) = 2,240 pounds (lbs) = 1.01604 tonnes.

Endnotes:

¹ Alan Barnard, *Visions and Profits: studies in the business career of Thomas Sutcliffe Mort*, Melbourne, Melbourne University Press, 1961, pp. 79-85; *Maryborough Chronicle, Wide Bay and Burnett Advertiser* (hereafter MC), 29 October 1864, p. 2, and 19 November 1864, p. 2, quoting *Peak Downs Telegram; Rockhampton and Central Queensland Advertiser*, 6 December 1864, p. 2 quoting *Peak Downs Telegram; North Australian*, 13 December 1864, p. 3; *Capricornian* (Rockhampton), 8 December 1877, p. 13; *Telegraph* (Brisbane), 1 August 1877, p. 2 and 19 December 1877, p. 2; *Queenslander* (Q), 11 August 1877, p. 6.

² Mervyn Royle, *Perry's Past: a centenary history of Perry Shire*, Mount Perry, Perry Shire Council, 1980 p. 12; Mervyn Royle, 'Mining and Mining Finance at Mount Perry – 1869 – 1919, Royal Historical Society of Queensland, *Journal*, 1981, vol. XI, no. 2, pp. 83-98; Ruth Kerr, 'Determining cultural heritage significance for abandoned mine sites – Mount Perry', *Proceedings of the Workshop on Management and remediation of Abandoned Mines*, 14 November 2003. Australian Centre for Mining Environmental Research; MC 20 February 1872, p. 2 and 3 October 1918, p. 3; *Dalby Herald and Western Queensland Advertiser*, 10 August 1872, p. 3 and 31 August 1872, p. 3.

³ John Kerr, *Mount Morgan: Gold, Copper and Oil*, St Lucia, JD & RS Kerr, 1982, Ch. 4.

⁴ *Queensland Parliamentary Debates*, vol. XXXIX, pp. 60, 66-88, 91-116, 117-147. The division for the defeat of the bill is on p. 147.

⁵ MC, 12 May 1884, p. 3; *Northern Miner*, 19 June 1885, p. 2; Kett Kennedy, 'The Cloncurry Copper Companies', Kett Kennedy (ed.), *Readings in North Queensland Mining History*, Townsville, James Cook University of North Queensland, 1980, vol. 1, pp. 221-250 at p. 222; Perry Hardy, *A Short History of the Cloncurry District*, Cloncurry Shire Council, 1983, p. 30.

⁶ Ruth Kerr, *John Moffat of Irvinebank: a biography of a regional entrepreneur*, St Lucia, J.D. & R.S. Kerr, 2000, Chapter 4; Queensland State Archives (QSA), ID 85662, MWO 12B/29; QSA, ID292465,

- A/44576, Application Areas 12,36 and 38 in Register of Furnace Areas and Water Rights; *Cairns Post*, 18 December 1884, p. 3; *Herberton Advertiser* (HA), 11 March 1885.
- ⁷ *Queenslander* (Q), 9 October 1886, p. 16; HA, 17 and 24 September 1886; Ruth Kerr, *John Moffat of Irvinebank: a biography of a regional entrepreneur*, St Lucia, J.D. & R.S. Kerr, 2000, Chapter 6.
- ⁸ MC, 4 August 1868, p. 2, 22 August 1868, p. 2, 8 October 1868, p. 2 and 10 March 1920, p. 3.
- ⁹ MC, 7 October 1869, p. 2.
- ¹⁰ *Gympie Times and Mary River Mining Gazette* (GT), 24 September 1873, p. 3 and 18 February 1874, p. 2. Mount Clara smelter chimney has been preserved. See GT, 16 February 1978, p. 21.
- ¹¹ MC, 11 September 1875, p. 4.
- ¹² Mount Clara Copper Mining Company file, Shareholder List as at 30 November 1873, QSA, ID283112, A/21306, Company No. 52, Book 1.
- ¹³ G. P. Walsh, 'Lloyd, George Alfred (1815–1897)', *Australian Dictionary of Biography*, National Centre of Biography, Australian National University (ADB), <http://adb.anu.edu.au/biography/lloyd-george-alfred-4029/text6399>, published first in hardcopy 1974, accessed online 25 January 2020; Norman Cowper and Ruth Teale, 'Allen, Sir George Wigram (1824–1885)', *ADB*, Australian National University, <http://adb.anu.edu.au/biography/allen-sir-george-wigram-2877/text4111>, published first in hardcopy 1969, accessed online 25 January 2020.
- ¹⁴ Q, 11 September 1869, p. 9 quoting MC and Q, 27 November 1869, p. 2.
- ¹⁵ *Brisbane Courier*, 27 May 1875, p. 3 quoting MC; Q, 11 September 1875, *Times, Ipswich Herald and General Advertiser*, 12 June 1875, p. 3.
- ¹⁶ This is demonstrated through the land selection and purchases in the Maryborough area by the Clayton family, chiefly Reginald B.B. Clayton and his connections with local politicians and businessmen.
- ¹⁷ *Wide Bay and Burnett News* (WB&BN), 29 August 1882.
- ¹⁸ MC, 28 September 1883, p. 2.
- ¹⁹ Christopher Schmitz, 'Robertson, James Robert Millar (1844–1932)', *ADB*, National Centre of Biography, Australian National University, <http://adb.anu.edu.au/biography/robertson-james-robert-millar-8235/text14417>, accessed 1 August 2019.
- ²⁰ MC, 31 March 1884, p. 3; The Department of Public Instruction was vitally interested in this in 1886 when they were considering opening a school at Torbanlea. They commissioned a report from William Fryar of the Department of Mines, who reported favourably on the coal deposits in July 1886. See, Letter No. 86/4497, QSA, ID 16356, EDU/Z2730.
- ²¹ MC, 12 March 1885, p. 2.
- ²² MC, 17 February 1887, p. 2.
- ²³ *Queensland Parliamentary Debates*, vol. LII, 22 September 1887, p. 680.
- ²⁴ *Ibid.*, vol. LII, 22 September 1887, p. 682.
- ²⁵ *Ibid.*, vol. LII, 22 September 1887, pp. 680–685.
- ²⁶ Portion 57, Parish of Walliebum, County of March; QSA, ID 23651, LAN/P57, Maryborough, p. 2207, Bundaberg, pp. 949, 1471 and 1062.
- ²⁷ QSA, ID7946, LAN/AW2, PRV9932/1/364, Letter No. 76/650 LW; ID78513, LAN/AW11, Letter No. 82/7010 LW; ID78514, LAN/AW11, Letter No. 82/7010 LW; ID78529, LAN/AW11, Letter No. 82/7513 LW; ID78530, LAN/AW11, Letter No. 82/7513LW; ID78533, LAN/AW11, Letter No. 82/7888CT; ID78961, LAN/AW14, PRV9932/1/2379, Letter No. 13955LW; ID78528, LAN/AW11, Letter No. 82/7266L.
- ²⁸ Selection 1019, Maryborough Land Agent's District, QSA, ID53368, LAN/AG584, Z7580. (The land is now described as Lot 2 on RP89993).
- ²⁹ QSA, ID 23485, LAN/P35, Z6167.
- ³⁰ BT31/4194/27126, Agreement between Reginald Byard Buchanan Clayton and Coultas Price Almond dated 15 August 1888, National Archives of the United Kingdom (NAUK).
- ³¹ MC, 21 July 1888, p. 2; For a detailed history see Don Chaput, 'E.A. Weinberg and the Australian Smelting Industry', Australasian Institute of Mining and Metallurgy Reprint, Southern Queensland Conference, July 1985; QSA, Company 199 Book 5; QSA, ID53368, LAN/AG584, Z7580; A copy of the Prospectus is held in the Guildhall Library, London.
- ³² BT31/4194/27126, NAUK.
- ³³ QSA, ID 283321, A/21,514, Company 199 Book 5; The British and French Rothschilds families held extensive interests in mining and exploration companies worldwide.
- ³⁴ BT31/3993/25399, NAUK.
- ³⁵ *Times* (London), 10 November 1888, p. 5; MC, 28 December 1888, p. 3.
- ³⁶ For details see MC, 27 July 1888, p. 2; *ibid.*, 28 December 1888, p. 3; *ibid.*, 18 and 25 March

- 1889, p. 2; WB&BN 22 June 1888; *Engineering and Mining Journal* 19 January 1889, p. 71.
- ³⁷ *Times* (London) 10 November 1888, p. 5; MC, 28 December 1888, p. 3; *ibid.*, 16 January 1889, p. 3.
- ³⁸ *Engineering and Mining Journal*, June 1889; MC, 16 January 1889, p. 3.
- ³⁹ Donald Clark, *Australian Mining & Metallurgy*, Melbourne, Critchley Parker, 1904, p. 296; WB&BN, 22 June 1889 and 5 September 1889, p. 3; *Brisbane Courier*, 13 March 1889, p. 5; MC, 25 February 1889, p. 2 and 5 September 1889, p. 3; George E. Loyau, *A History of Maryborough and Wide Bay Burnett from 1850 to 1895*, Pole Outridge, Brisbane, 1897, pp. 340-44.
- ⁴⁰ J. Malcolm Maclaren, *Report on Queensland Mining Practice*, 1901, p. 32.
- ⁴¹ *London Mining Journal* (hereafter MJ), 16 May 1891, p. 557.
- ⁴² *North Queensland Register*, 17 August 1892, p. 26.
- ⁴³ MC, 9 August 1892, p. 3.
- ⁴⁴ MJ, 2 July 1892, p. 733; MC, 16 August 1892, p. 3 quoting *Financial Times* (London), 1 July 1892.
- ⁴⁵ MC, 23 January 1891, p. 2.
- ⁴⁶ David Elder Reid lived at Chatsworth and was Mayor of Gympie in 1903.
- ⁴⁷ MC, 21 April 1891, p. 3.
- ⁴⁸ MC, 20 July 1893, p. 2.
- ⁴⁹ MC, 18 April 1898, p. 3; Queensland. *Parliamentary Papers*. Mines Department, *Annual Report*, 1906.
- ⁵⁰ *North Queensland Register*, 17 August 1892, p. 26.
- ⁵¹ MJ, 2 July 1892, p. 733; MC, 16 August 1892, p. 3 quoting *Financial Times* (London) 1 July.
- ⁵² MJ, 21 October 1893, p. 1,182; MC, 2 February 1893, p. 3.
- ⁵³ MJ, 8 December 1894, p. 1,350; MC, 23 January 1895, p. 3.
- ⁵⁴ Supplement to the *Mining World and Engineering Record*, 28 December 1895, p. 1,092; GT, 22 February 1898, p. 2.
- ⁵⁵ Stock Exchange *Yearbook* (London) 1895, p. 650 and 1896, p. 729.
- ⁵⁶ *Ibid*, pp. 257-265; MC, 17 January 1895, p. 3.
- ⁵⁷ Supplement to the *Mining World and Engineering Record* 5 December 1896, p. 1050.
- ⁵⁸ Queensland. *Votes and Proceedings, Report with Minutes of Evidence taken before the Royal Commission appointed to Inquire into and Report upon the Laws relating to Mining for gold and other minerals and the best mode in which assistance can be rendered to develop the Mineral Resources of the Colony together with the Proceedings of the Commission and Appendices*, 1897, pp. 423-427, 507.
- ⁵⁹ *Ibid*.
- ⁶⁰ *Telegraph* (Brisbane), 9 April 1898, p. 4; MC, 6 April 1898, p. 3, quoting *British Australasian*.
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- ⁶³ *Australian Mining Standard* (AMS) 2 June 1898, p. 2,971; *London Gazette* 6 September 1898, p. 5,346; QSA, ID 283321, A/21,514, Company 199 Book 5.
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- ⁶⁶ MC, 15 January 1903, p. 3 (referred to 'Oertling' as 'Oerthing in the article); For information on Oertling balances see, Nicola H. Williams, 'Brass Among the Gold', *Journal of the Australasian Mining History Association*, vol. 2, September 2004, pp. 222-230.
- ⁶⁷ MC, 15 January 1903, p. 3.
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- ⁷¹ AMS, 6 March 1907, p. 217.
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- ⁷⁵ MC, 20 January 1910, p. 2 and 13 May 1910, p. 2; *Gympie Miner* 19 January 1910.
- ⁷⁶ MC, 26 March 1910, p. 8.
- ⁷⁷ MC, 13 March 1920, p. 2.
- ⁷⁸ Queensland. Railway Department, *Weekly Notice*, Nos. 637 and 661.