

## **Australian Capital in New Zealand: The Te Aroha Silver and Gold Mining Company**

By PHILIP HART  
*University of Waitako*

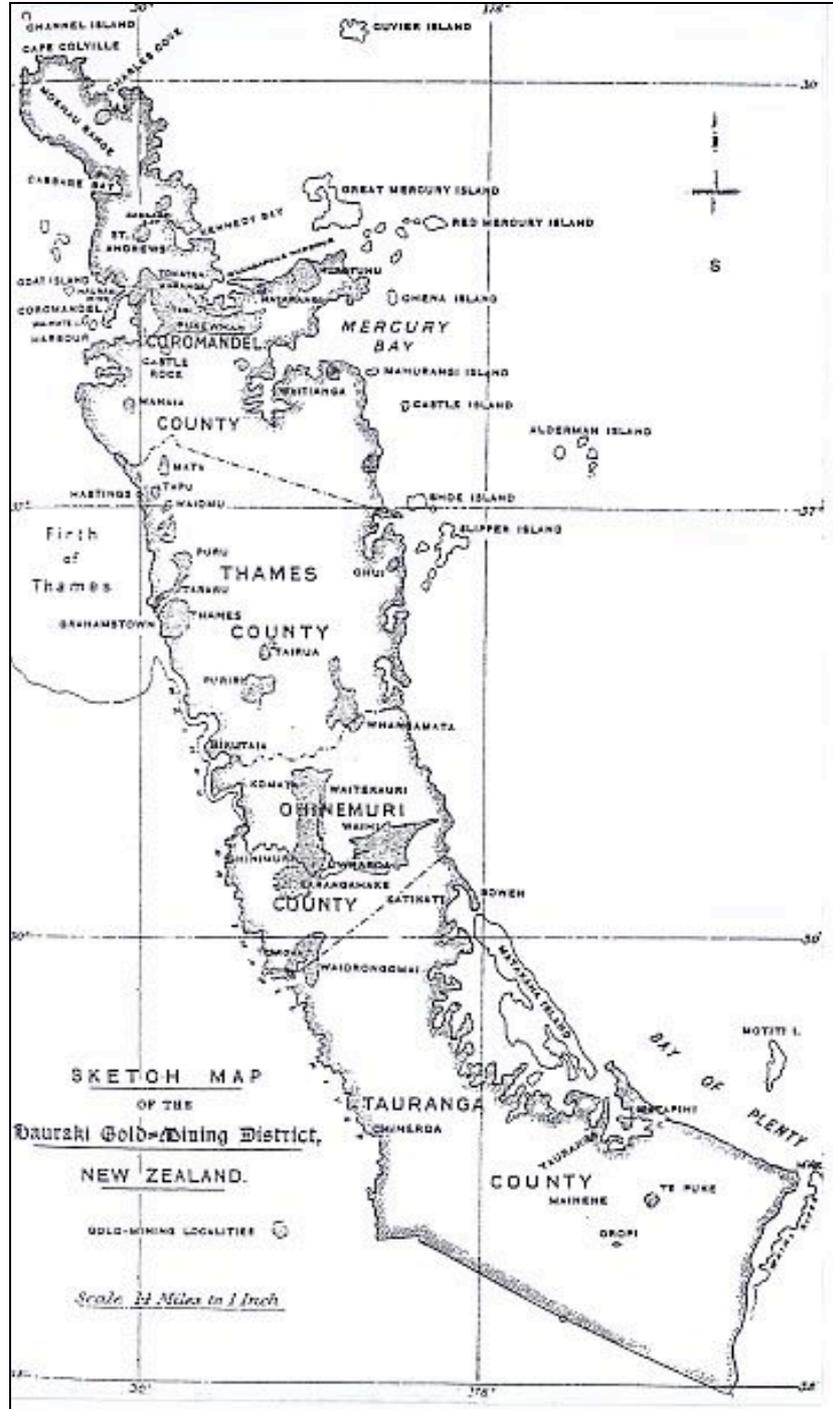
The Waiorongomai goldfield on the slopes of Te Aroha mountain at the southern end of the Coromandel Peninsula in the North Island, was the most southerly field of any significance in the Hauraki district. It went through the normal pattern of development. First individual prospectors, then small parties of miners with their expenses being paid by sleeping partners, then small under-capitalised New Zealand companies, succeeded by larger but still under-capitalised ones, and finally attempts to interest wealthier overseas syndicates. As even the most 'sanguine' miners came to understand, most of the ore was refractory and of generally low grade,<sup>1</sup> requiring costly treatment by companies with large capital. As one of the wardens explained, the 'appliances' needed were 'so expensive that it is impossible for men with small means to work small holdings'. Only capitalists 'prepared to expend large sums of money in erecting machinery, and constructing tramways, shoots, and easements can develop this industry to advantage'.<sup>2</sup>

The lack of local capital meant that the Australasian colonies were dependent on the London market, without which major developments were impossible.<sup>3</sup> It has been estimated that private capital amounting to £33 million came to New Zealand between 1840 and 1886, but very little went to mining.<sup>4</sup> Not until the start of the 1880s did mining become an important part of English overseas investment.<sup>5</sup> This involvement in Hauraki mining became significant in that decade, and the following one saw a big increase in mining speculation, as in Australia and South Africa.<sup>6</sup>

Australian investors, principally based in Sydney and Melbourne, were a minor component of foreign investment in New Zealand. Insufficient information prevents precision about the amount of private investment in the colony in general and in mining in particular, but it is clear that the latter was a lesser component than investment in agriculture and housing.<sup>7</sup> During the late 1880s, Australian investors were interested in some Te Aroha mines, but principally in other parts of the Hauraki district.<sup>8</sup> Some New Zealanders suspected that Australian capital would be of 'very great advantage to the

promoters' but 'of little benefit to the community at large', for the Australians wanted profit not the development of the fields.<sup>9</sup>

**Map 1:** *The Hauraki Gold-Mining District New Zealand.*



Source: Joseph Campbell, 'The Gold-Fields of the Hauraki Peninsula, New Zealand', *Transactions of the Federated Institution of Mining Engineers*, vol. XII, 1896-97, p. 482.

The Battery Company, an Auckland-based firm that by 1887 had taken over most of the Waiorongomai mines after they had proved unprofitable in the hands of smaller

companies, had used the cheapest possible mining techniques and replaced cheap wages men with cheaper contractors.<sup>10</sup> Even these methods, combined with central and local government meeting the cost of constructing and repairing the tramway to their battery, the only one on the field, could not make the company profitable. It was recognised that the capital was insufficient.<sup>11</sup> Accordingly, the directors sought to find new technology that would extract a greater amount of the value more cheaply and also to attract overseas investment. 'A gentleman representing a number of mining capitalists of Victoria' visited nine months after crushing commenced, took samples, and was encouraged by the warden and leading mine managers to invest; his principals were not tempted.<sup>12</sup> Five years later, in 1887, a representative of London capital unsuccessfully offered to float a company on terms that provided the maximum possibility of share manipulation for the London speculators and the minimum amount of cash for the vendors.<sup>13</sup> At the same time, the company considered the possibility of driving a low level tunnel to open up the ground more systematically and economically.<sup>14</sup>

### **William Robert Wilson**

Nothing came of these plans until Josiah Clifton Firth, the principal director of the Battery Company, with his manager, Henry Hopper Adams, went to America in late 1886 to inspect the latest treatment processes. By coincidence, William Robert Wilson, a founder of the Broken Hill Proprietary [BHP] and actively involved in the development of the mines at Broken Hill,<sup>15</sup> was visiting America at the same time for the same purpose and to obtain the services of the best American experts.<sup>16</sup> All three became acquainted whilst returning on the same boat, and the New Zealanders impressed Wilson with the possibilities of the Waiorongomai field.<sup>17</sup> Naturally they were impressed with him and the resources he could command. An English mining correspondent who met Wilson when he was involved with Western Australian mining described him as one of 'the very ablest men I have ever met outside London and New York'.<sup>18</sup> A newspaper published near Te Aroha, over-awed by the capital he could introduce to a fading goldfield, described him as 'second to none as an expert in the treatment of ores and the value of mineral stone'.<sup>19</sup> Believed to be 'one of the leading mining capitalists of Australia' and 'one of the wealthiest' of the Broken Hill investors, he had access to 'unlimited capital'.<sup>20</sup>

Wilson's connection with New Zealand had begun in 1867 when, aged 17, he went to the West Coast of the South Island, where he mined for the next five years.<sup>21</sup> He returned in 1883 and 1888 to visit Rotorua because of his rheumatism.<sup>22</sup> Wilson was also interested in acquiring New Zealand horses for his racing stud, and would buy several in the 1890s.<sup>23</sup> In March 1888, at Adams' prompting, he spent two days inspecting the Waiorongomai mines, personally selecting samples for testing. Before these were made, he declared himself 'favourably impressed', but citing his Broken Hill experience, considered that the ore required 'skilful and correct treatment'.

In this district, more than any I have yet visited, the *best* skill is needed, as beyond question a very large proportion of the ores are extremely base and refractory. Of course after a two days visit I cannot give a very decided opinion, but if the values stated are correct (and I have no reason to doubt them) there are many thousands of tons of ore in sight, in more claims than one, that should give a fair profit, *if properly treated*.<sup>24</sup>

Adams produced a most favourable report on the prospects: in addition to the auriferous reefs already discovered, there was 'no doubt' that further prospecting would produce 'satisfactory results'. He was 'quite sure' that adequate development coupled with the right machinery would 'prove a very profitable investment and return a satisfactory interest on the capital expended'.<sup>25</sup>

Wilson offered to purchase Battery Company's mines and plant for £25,000, a price rejected because the owners valued their property at least three times higher. They then dropped their price from their hoped-for \$75,000 to £30,000, which Wilson declined, announcing that he would return to Australia. 'Only a short time before the advertised hour of the vessel's departure an agreement was arrived at' whereby the company received £25,000 in cash and a one-fifth interest represented in paid-up shares.<sup>26</sup> The news caused local ecstasy: the *Te Aroha News* reported it under the headline 'The Coming Mining Boom'. It was in no doubt that 'no more bona fide mining property has ever been floated in the Colony', and warranted 'the expenditure of very large capital for its development, and in the introduction of scientific knowledge and appliances'.<sup>27</sup> Its editorial stated that Wilson had 'thoroughly inspected the property',<sup>28</sup> a questionable assessment of a two day visit and the testing of a small number of samples.

### **Wilson's company**

Wilson had bought the properties 'on behalf of himself and two or three friends', not for BHP.<sup>29</sup> In late April, when he floated the limited liability Te Aroha Silver and Gold Mining Company 'privately' in Melbourne, all the shares were instantly allotted.<sup>30</sup> The nominal capital was £200,000 in £1 shares but as these were issued as paid up to 15s, it was really a quarter of that amount.<sup>31</sup> This company, therefore, provided a minute percentage of Australian investment in New Zealand mining. The prospectus explained that the public paid 5s on application and another 5s on allotment, after which their shares would 'rank alike' with those received by the promoters. The vendors took 'no profit in cash, being satisfied to await results and profits'.<sup>32</sup> As the promoters received half the nominal capital and provided only £21,000 in working capital, one Auckland newspaper commented that 'If that is not coining money with a vengeance we don't know what is'.<sup>33</sup>

On 30 November 1889 there were 157 shareholders; in the preceding six months another 21 had sold their interests or had had them forfeited for non-payment of calls. There were 26 New Zealand shareholders, another was a former New Zealander living in London, and the remaining 130 were Australian, as were all bar one of the 21 who had ceased to hold interests: the one was a New Zealander. Their occupations were not recorded. The first directors were Wilson, who was the chairman, William Peter McGregor, William Jamieson, all actively involved in Broken Hill mining; the local director, James McCosh Clark of Auckland, formerly a director of the Battery Company; and Charles William Chapman of Melbourne. Although there were only supposed to be five directors, Alexander Campbell of Melbourne and the first secretary of the company William Knox who was actively involved with BHP, were also listed as directors later in 1888 but not in the following year. Several other shareholders were closely linked with BHP,<sup>34</sup> others with interests in BHP whose careers have not been traced also probably held shares. These investors were not naïve innocents but experienced mining men who anticipated making a profit through mining, for they had not sold their interests even when the company faced difficulties. They were as serious about this venture as about Broken Hill, and the engineers who developed the mine and plant there had the same roles at Waiorongomai.

Even before purchasing the properties, Wilson had emphasized that, while his syndicate had ‘no intention of removing’ Adams as manager, the new owners would send ‘a skilled expert’ to ‘inspect and advise us’.<sup>35</sup> This expert was an American, John Howell, who in Wilson’s opinion was ‘one of the foremost Mining Engineers’.<sup>36</sup> Howell had much experience as a metallurgist and in erecting and supervising reduction plants.<sup>37</sup> He was ‘the patentee of the White and Howell Revolving Roaster’, which Adams had recently added to the battery.<sup>38</sup> When he arrived from California, *en route* for Broken Hill, he inspected the property with Adams.<sup>39</sup> Howell had been instructed to determine what machinery was needed and subsequently erected the first vanner used at Waiorongomai reporting positively on the ‘character and composition of the ores’ and their ‘concentrating qualities’.<sup>40</sup> Assisted by two Auckland scientists, he spent five weeks experimenting and also consulted with Wilson and Clark.<sup>41</sup> Howell was optimistic that low-grade ore could ‘be treated to advantage by concentrating and smelting’, to provide a profit of 30s per ton which would ‘yield large and profitable returns’.<sup>42</sup> Wilson declared himself ‘well satisfied’ with tests that showed that by smelting the concentrates there would be an ‘enormous saving in fluxes and fuel’, removing silica and retaining the ‘essential portion of the ore’.<sup>43</sup> The new plant, erected under the supervision of Adams, was expected to treat refractory ores ‘not amenable to the ordinary methods’ received from all parts of the peninsula. Ore ‘in any quantities’ would be purchased for cash, ‘on a sliding scale of prices, according to assay value’.<sup>44</sup>

While waiting for the battery to be reconstructed, additional claims were acquired, giving the company 225 acres.<sup>45</sup> It immediately employed 40 miners, let contracts requiring another 30, and anticipated a future workforce of from 200 to 300.<sup>46</sup> Wilson announced that he would spend £20,000 on mines, water races, and battery, and immediately after purchasing the property sent ore to an Adelaide smelter to ascertain ‘the necessary fluxes’.<sup>47</sup> New tunnels were driven and winzes sunk in several mines.<sup>48</sup> More prospecting was done, a new reef was found, and by July from 130 to 150 men were prospecting and mining.<sup>49</sup> Development was restricted to developing existing mines, with ‘favourable results’ reported.<sup>50</sup> In early 1889 the company employed 216 men, including carpenters and others rebuilding the battery, and by the middle of the year almost 2,000 feet [610m] had been driven on various reefs, and some ore stoped out.<sup>51</sup> Systematic work was confined to the two best mines.<sup>52</sup>

### **The best battery in Australasia**

The new battery added stonebreakers that reduced the ore until it could pass through a two-inch [five cm] grating, and an extra 20-head of stampers was added to the existing 40. From the stampers, the 'pulverised material' was forced through gratings that were much finer than was normal in New Zealand. It then went over 'quicksilvered-copper plates' which retained most of the free gold. Coarser particles and sulphides containing gold and silver went to the concentrating plant, which contained Frue concentrators, or vanners. From these they went to a 'Howell patent revolving-cylinder furnace' and then to a reverberatory furnace. Once cooled, the ore received its final treatment in a wet jacket smelting furnace, which produced bars of bullion for shipping to refineries. The residue remaining after the concentrates had been separated from the pulverised ore was sent to the tailings plant where part was put through berdans and the remainder treated by 'a Boss Continuous Pan Plant'.<sup>53</sup> The enlarged buildings were lit by electricity for the first time, and Adams designed a double Pelton wheel with a speed 'as steady and regular as possible'.<sup>54</sup> The Inspecting Engineer of the Mines Department considered that no other plant in Australasia was capable of treating refractory ore 'with the same probability of success'.<sup>55</sup> His purchasing 500 shares in the company showed that Howell expected his battery would succeed.<sup>56</sup> He was 'sanguine of being able to treat at a profit ores of a grade that would not pay under any other treatment', including ore from Australia.<sup>57</sup> When Wilson inspected the completed plant, he described it as 'by far the most complete combination plant in the whole of the Australasian Colonies', thus reflecting the greatest credit on Howell.<sup>58</sup>

A reporter who visited the district while the plant was being constructed noted that 'many people' considered there would 'never be enough gold found there to pay expenses'.<sup>59</sup> However, 'everyone' expected the new appliances to succeed.<sup>60</sup> Being the first 'combination plant' in New Zealand, meaning that it could treat all types of ore, it was expected to bring great changes to the industry and make unprofitable mines profitable.<sup>61</sup> A Sydney reporter considered that this 'most complete, most perfect, and ... most extensive' plant could 'revolutionise the mining industry in the southern hemisphere'.<sup>62</sup>

Despite the earlier assurances that Adams would be retained as general manager, he was replaced in December 1888 when Howell returned from Broken Hill. Adams and his mine manager immediately resigned.<sup>63</sup> Although Howell's changes to the plant

created some interest in other mining districts,<sup>64</sup> most mine and battery managers were not convinced of the benefits of sending concentrates for further treatment at Waiorongomai. According to the local newspaper, which supported Howell in the hope that he would create a mining recovery, there was ‘a great and unaccountable dislike’ of changing ‘from the old method’ to ‘what some are pleased to term “new fangled notions”’.<sup>65</sup>

### **The battery in operation**

The reconstruction took a long time to complete. Not until late June 1889 did the battery commence operating with 35 stampers, the extra stampers not being tested until a month later. Using stamp-mortars patented by Howell in America, they were reportedly ‘in every way a great improvement’.<sup>66</sup> Lead flux was imported from Broken Hill,<sup>67</sup> and skilled men were also imported to assist with completing the plant and supervising its operations. Matthew Buchan Jamieson, a Melbourne engineer and a shareholder, assisted its construction.<sup>68</sup> An American analyst and assayer working for BHP, J.G. Poage, supervised smelting during Howell’s absence.<sup>69</sup> William Adams, Jr., who had helped Howell erect and operate similar plants in America over the previous 16 years, was appointed battery manager.<sup>70</sup> In September the plant was in full operation, working 24 hours a day, and ‘clearly’ demonstrating that the ‘general run’ of Waiorongomai ore was ‘suitable for concentration, and more cheaply treated by this method’.<sup>71</sup> The first meeting of shareholders held after production commenced was told that the bullion bars produced contained ‘over 99 per cent of the assay values of the crude concentrates and ore smelted ... [mostly] obtained from ores with the most refractory character which by ordinary methods of treatment would have been lost’.<sup>72</sup> Howell and shareholder William H. Patton, who had been appointed general manager of BHP by Wilson in 1887, reported to Wilson on the first two months of operation. The period had shown that the plant could successfully treat ‘the most refractory ores from the Company’s mines and other mining Districts at a cost per ton far below our former estimates’. A ‘high percentage’ of silver and gold had been extracted from previously valueless ‘base ores’ at a cost of under 7s per ton of crude ore.<sup>73</sup>

William Adams later provided details of the costs of each part of the process: the combined costs of crushing, concentrating, roasting, cindering, and smelting came to £3.1s.10d per ton. ‘About 99.5 per cent of the assay value of all ores, concentrates, and

base bullion' treated had been saved.<sup>74</sup> The warden interpreted these figures as providing 'a substantial profit to the shareholders' and proving that this if possibly modified, the process would be 'universally used' for all classes of base ore.<sup>75</sup>

### **Processing of ore ceases**

Despite its apparent success, the battery ceased to operate at full capacity from the beginning of November 1889, after two months of full-scale working, and was shut down completely in the middle of the following January, 'having treated all the ore they had on hand'.<sup>76</sup> The value of the ore 'in sight' was insufficient to pay for working.<sup>77</sup> Mining had been severely cut back in September for this reason, the sudden reduction in the number of miners casting 'quite a damper over the place, being quite unlooked for'.<sup>78</sup> The following month saw a visit by Patton, already responsible for significant improvements in BHPs mining methods.<sup>79</sup> Officially he had 'come to New Zealand entirely on account of his health' and to visit his 'very old friend' Howell, but soon made 'a careful examination of the property and the prospects of the mine'.<sup>80</sup> The local newspaper reported that he appeared to be 'favourably impressed with Waiorongomai as a field for mining operations on a large scale', and spoke 'in high terms' of the plant, but did 'not wish to express any decided opinion respecting the mine, not having gone much into the subject'.<sup>81</sup> At the beginning of November, Patton, Howell and Pogue left for Broken Hill, the plant being largely shut down. A large number of workers were dismissed and only a 'comparatively small' amount of mining continued, pending further instructions from the directors.<sup>82</sup>

### **A low level tunnel and seeking government assistance**

The *Te Aroha News*, while proclaiming that this 'comparative stoppage' would be only temporary and that work would soon recommence 'on a very large scale indeed', admitted there were other difficulties apart from the immediate shortage of payable ore. Transporting ore by the tramway was not only 'far too expensive' but it could only carry half the amount that the battery could treat: 'Waiorongomai ores not being rich, makes it all the more necessary that large quantities be dealt with'. As well, 'the old system of working the mines by means of short crosscuts, tunnels, shoots, and branch tramlines' was 'too costly for the quantity of ore obtained'. If the cost of extraction could be 'greatly reduced, large quantities of low grade ore, that at present will not pay

for sending down for treatment, could then be treated at a profit'. The best mine had been 'pretty thoroughly exhausted' before the company acquired it, but the newspaper claimed that there was 'good reason to assume that valuable bodies of ore would be intersected at ... depth'. It had heard that the company was planning a low level tunnel, and enthusiastically supported the notion.<sup>83</sup>

The shareholders' meeting at the end of November was told that, although 'the body of refractory but payable ore which was first exposed had not proved of a permanent character', the battery had worked so well that the directors were to make 'a determined effort' to prevent its closure. Wilson would revisit New Zealand 'with a view of inducing the Government to subsidize the costly work of driving the low level tunnel' that they believed would best open up their ground.<sup>84</sup> Wilson and his brother Samuel spent two days at the beginning of January 1890 inspecting the mines and plant. He announced that nothing definite had been decided apart from the low level drive, which would be 'the most important work ever entered upon on this gold field'.<sup>85</sup>

This tunnel had been recommended to Wilson by Howell and Patton in early December. They proposed driving a crosscut from the main tramline at a point 450 feet [137m] above the battery for 5,000 feet [1,524m] along the lode, cutting all the lateral veins with their better quality ore at a depth of from 1,000 to 1,600 feet [305 to 488m] from the surface. This low level, it was stated, would reduce the cost of mining and transporting ore by over a half, and also drain the mines, the water so extracted being used 'as a motive power for increased ore reducing facilities'. They 'had reasons for believing that immense bodies of a grade of ore that will leave a fair profit' would be found, that mining could continue 'for many years', and the battery successfully treat 'ores of all classes from all parts of the country'. They contrasted this prospect with abandoning the property and dismantling the plant, a 'blow' to New Zealand mining that would be 'felt for many years'. It was therefore 'advisable to use every endeavor to procure aid from the Government and people of New Zealand in the prosecution of an enterprise that promises so much good to the country at large'.<sup>86</sup>

As had happened before and would recur whenever private enterprise struck financial difficulties, the government was asked to assist. Clark had made the first request for aid in October, when, after only three weeks of smelting, he informed the Minister of Mines that there was a 'probability' of the company going into voluntary liquidation and the plant 'dismantled and dispersed' because the ore had 'proved much

lower in quality than previous tests indicated'. The Melbourne directors were not interested in running a plant that merely treated ore supplied by other goldfields. Clark argued that the battery was of 'Colonial importance' because it had proved the benefits of the chlorodising, roasting, and smelting processes, and its loss 'would be a public calamity'. His recommendation that the government either subsidise or purchase the plant received no response.<sup>87</sup> Undeterred, in January Wilson provided the Acting Premier with details of the low level drive which he estimated would cost £40,000, and asked the government to meet half this amount. Government backing 'would mean the finding of many years work for at least two thousand miners', whereas rejection of the application would mean the dismantling of the plant.<sup>88</sup> Wilson personally interviewed the Acting Premier, whom he claimed was 'most favourably impressed with the proposal'.<sup>89</sup> Naturally there was local support and claims that it would be a 'public calamity' if the government did not provide assistance to prevent the plant being sold abroad.<sup>90</sup>

The Inspecting Engineer, accompanied by the mining inspector and a professor of geology, inspected the site in February. The revised plan was to drive 5,600 feet [1,707m] at a cost of about £30,000, dispensing with 'two steep grades' of the tramway and 'considerably' lessening the cost of transit.

Indeed the project now proposed ought to have been undertaken by the present company before erecting such an extensive plant, and even at the present time it would be better for them to do this and thoroughly test the ground before taking into consideration the removal of their plant.

Removing it would be 'a loss to the District', for it was 'questionable' whether 'so extensive a plant' would ever be re-erected, but at the same time the company would lose four-fifths of its value by taking it to Australia. He warned that the proposed subsidy 'would no doubt open up a precedent and other Companies throughout the Colony would make similar applications which would be difficult to refuse'.<sup>91</sup> Using lack of funds as the excuse, Cabinet decided that the request could not be granted.<sup>92</sup> Despite local laments, it refused to alter its decision.<sup>93</sup>

### **End of the company**

All but one of those who had run the plant had already found positions at Broken Hill.<sup>94</sup>

The company obtained protection for its mines and continued to pay its rents, but the only mining consisted of one party of tributers putting in a prospecting drive and another party crushing tailings.<sup>95</sup> Miners complained that it had locked the ground up, forcing men to leave the district.<sup>96</sup> In June, one of the rotary furnaces was dismantled in readiness for sending to Australia.<sup>97</sup> Four months later, the company sought another four months' protection, but the warden only granted two, and stated that the directors 'must decide something definite as to their future action within that time'.<sup>98</sup> Within three days a cable was received instructing that both plant and mining leases be auctioned.<sup>99</sup> At the auction at the beginning of December, all the mining leases, the stampers, berdans, furnace, and 'the greater part of the plant', along with all the buildings, attracted a bid of only £3,010, which was declined.<sup>100</sup> Four days later, the company accepted £3,500 from Adams and his partner. The concentration plant was not sold but was to be removed to Australia.<sup>101</sup> At the beginning of 1891, shareholders resolved to wind up the company.<sup>102</sup> Howell offered employment to 'any of the old hands' at Broken Hill, at good wages, and several accepted.<sup>103</sup>

### **Why did the company fail?**

Wilson, who had initially been 'struck with the apparent richness of the rock, had realised by November that the process 'was too costly for the amount of gold obtained'.<sup>104</sup> The Inspecting Engineer criticised the American experts because their 'most expensive' plant was not suitable to deal with a class of ore that they had never treated previously.<sup>105</sup> He claimed that 'Further additions' to the plant were required 'to make it suitable for treating every class'.<sup>106</sup> It had quickly been discovered that the plant was not suitable for all types of ore, and especially not for that from the Tui mines on the opposite side of Mount Te Aroha.<sup>107</sup> The first month-and-a-half of full operation had revealed the battery to be unprofitable because of insufficient ore, an inappropriate process, and in particular the cost of fluxes. 'Each ton of local ore and concentrate smelted required a ton of Broken Hill lead-ore, as well as other fluxes. The plant was erected on the assumption that the Tui Mine', which contained 'large amounts of lead-ores, would supply part of the smelting-charge. But the Tui ore was found to carry as much zinc as lead, and could not be used as a flux'.<sup>108</sup> Clark stated in 1892 that the company had wanted to purchase concentrates from other districts 'to assist in fluxing dry ores', but despite offering generous terms, mine managers either did not send

samples, or sent the very poorest.<sup>109</sup> Being forced to import fluxes made the process too costly for treating any but exceptionally high-grade ore.<sup>110</sup> It was also discovered that the gold was so fine that it ‘would not concentrate’, and the plant ‘could not save what gold was won’.<sup>111</sup> The *Te Aroha News* argued that the process was from a quarter to a half more expensive than was necessary.<sup>112</sup> One historian has argued that using chlorination increased total labour costs ‘and pushed the company into deficit’.<sup>113</sup>

One particularly important criticism made by the Inspecting Engineer was that the company had erected the plant ‘without ascertaining whether the quantity of ore necessary to keep it going could be procured from their mine’. It was ‘the same old story - instead of spending several thousands of pounds in prospecting and testing the mine, the company had full confidence in the information they received, and spent their capital in the erection of a plant’.<sup>114</sup> He even incorrectly stated that the company had done no prospecting.<sup>115</sup> There was general agreement that there had been inadequate development of the mines.<sup>116</sup> One leading New Zealand mine manager cited Waiorongomai as ‘another example of extravagance and waste of money on milling and smelting works’. The plant was ‘in complete working order before any efforts were made to ascertain whether the prospective output of ore from the mines adjacent thereto was sufficient in quantity to warrant such lavish expenditure’. Consequently, ‘the whole concern’ was ‘disposed of for less than *one tenth* of its original cost’.<sup>117</sup> As well, metallurgists should have experimented more thoroughly on local ores and local fluxes to ensure that the process would succeed.

A New Zealand mining commentator considered that the battery manager’s salary of £2,000 and the mine manager’s £500 had been excessive burdens.<sup>118</sup> However, Wilson believed in paying his experts well, and these costs did not fundamentally affect the outcome. Insufficient working capital was also blamed, although the initial expectation that only £20,000 would be spent<sup>119</sup> was wrong. The *Te Aroha News* estimated that the company spent between £50,000 and £60,000 within a year and a half.<sup>120</sup> Without its records this cannot be confirmed, but £22,780 was spent just on erecting the plant, repairing and extending the water races and repairing the tramway.<sup>121</sup> Within a year of operation, the company had to request an overdraft limit of £20,000, and after its collapse ‘lack of capital’ was cited as to why the property had not been more fully developed.<sup>122</sup> Shareholders were required to pay three calls totalling 2s between December 1888 and the following June and while this produced an extra £17,088.9s, many were unwilling to pay. By November 1889, £2,991.11s remained unpaid and 44,630 shares had been forfeited.<sup>123</sup>

### **Impact on the field and Australian investment after the Company's failure**

After all the 'high expectations', the company's failure was regarded by the local newspaper as 'the most serious check' yet to mining at Waiorongomai.<sup>124</sup> Because the government would not assist their proposed low level tunnel, the owners 'preferred the first, certain loss, to risking further capital', and 'the way in which they afterwards did their best to damage the place as a gold producing field, showed neither justice nor generosity on their part'. This appears to be a reference to the plant being removed to Australia.<sup>125</sup> The Inspecting Engineer wrote that the company had proved a curse not a blessing 'and put back the development of the field for many years'.<sup>126</sup> Nevertheless, mining did continue on a much smaller scale, with some miners finding patches of ore that could be profitably treated.

Wilson invested £5,000 in 1890 in another unsuccessful New Zealand mining venture.<sup>127</sup> Five years later, during the mining boom, a Thames newspaper wrote that he had 'speculated a little too early in our district, and in consequence was hard hit at Te Aroha. It was a thousand pities as he is a fine fellow and if he had had decent luck he would most likely now have been one of our foremost mining speculations'.<sup>128</sup> Instead of again investing in New Zealand mines, he became one of the pioneer investors in the Murchison and Coolgardie fields.<sup>129</sup>

During the mining boom of 1895, it was reported that Australians had invested a considerable but unspecified amount in Hauraki mines.<sup>130</sup> Even in the following year, after the boom was over, capital was being provided by Australian as well as English investors.<sup>131</sup> Investment in districts other than Te Aroha has not been traced, but must have continued. Although Waiorongomai was one of the least favoured fields, a representative of Australian capital investigated prospects there in 1897.<sup>132</sup> That year, a self-proclaimed Australian 'expert' in treating refractory ore inspected these mines and claimed to be able to introduce Sydney capital. However, the unsuccessful British company he formed had only eight Sydney shareholders, who held a mere 3,600 of the 27,371 shares issued by the end of 1898.<sup>133</sup> Attempts to obtain Australian capital for this district continued in the early twentieth century.<sup>134</sup> The last such futile attempt was in 1931.<sup>135</sup>

### **A typical scenario**

Although the details varied from other companies and other goldfields, the failure of this company was typical. Most mines throughout the world were unsuccessful, and

most mining companies failed.<sup>136</sup> Before foreign capital was introduced into the Waiorongomai field, all the local companies had failed within a few years. The fundamental reason was that its low-grade ore was difficult to treat profitably. As a consequence, only two local companies paid dividends: one paid a single dividend, of 6d per share, and the other paid four dividends totalling 4s 6d.<sup>137</sup> The small number of other foreign companies tempted to invest there were no more successful, for similar reasons. The inadequacy of preparatory investigations was repeated during the mining boom of the mid-1890s, when a company formed by English and French investors repeated the fundamental mistake of, in the words of the *Te Aroha News*, ‘putting the cart before the horse, or the plant before the quartz’.<sup>138</sup> Whilst many failures, especially of local companies, could be explained by lack of skill combined with insufficient capital, the Te Aroha Silver and Gold Mining Company was notable for the competence of its managers and its significantly larger capital resources. Nonetheless, these managers overestimated the value of the ore and constructed a plant that did not fulfill their expectations.

---

## Endnotes

<sup>1</sup> John Henderson, assisted by John Arthur Bartrum, *The Geology of the Aroha Subdivision, Hauraki, New Zealand: Geological Survey Bulletin no. 16 (New Series)*, Wellington, 1913, pp. 89-90, 93, 97-98, 109; J.F. Downey, *Gold-Mines of the Hauraki District, New Zealand*, Wellington, 1935, p. 261.

<sup>2</sup> H.A. Stratford to Minister of Mines, 2 February 1887, Mines Department, MD1, 87/89, Archives New Zealand, Wellington Office [hereafter ANZ-W].

<sup>3</sup> H.J. Hanham, ‘New Zealand Promoters and British Investors, 1860-1895’, in Robert Chapman and Keith Sinclair (eds), *Studies in a Small Democracy: Essays in Honour of Willis Airey*, Auckland, 1963, p. 56; J.W. McCarty, ‘British Investment in Western Australian Gold Mining, 1894-1914’, *University Studies in History*, vol. 4, no. 1, 1961-62, p. 7; W.J. Gardner, ‘A Colonial Economy’, in G.W. Rice (ed.), *The Oxford History of New Zealand*, 2nd edn, Auckland, 1992, pp. 69, 71, 74, 76-78.

<sup>4</sup> William Rosenberg, ‘Capital Imports and Growth – The Case of New Zealand – Foreign Investment in New Zealand, 1840-1948’, *Economic Journal*, vol. LXXI, no. 281, March 1961, p. 94; see also C.G.F. Simkin, *The Instability of a Dependent Economy: Economic fluctuations in New Zealand 1840-1914*, Oxford, 1951, pp. 83-85, 90.

<sup>5</sup> McCarty, ‘British Investment’, p. 8; Matthew Simon, ‘The Pattern of New British Portfolio Foreign Investment, 1865-1914’, in A.R. Hall (ed.), *The Export of Capital from Britain 1870-1914*, London, 1968, pp. 23-24, 34.

<sup>6</sup> J.H.M. Salmon, *A History of Goldmining in New Zealand*, Wellington, 1963, pp. 12, 206, 250.

<sup>7</sup> J.A. Downie, ‘Inverse Relations of the Australian and New Zealand Economies, 1871-1900’, *Australian Economic Papers*, vol. 2 no. 2, December 1963, pp. 155, 158-159, 175; Downie, ‘The Course and Character of Capital Formation in New Zealand, 1871-1900’, *New Zealand Economic Papers*, vol. 1, no. 1, Spring 1966, pp. 45-47.

<sup>8</sup> For instance, *Te Aroha News*, 14 January 1888, p. 2, 12 September 1888, p. 2; *Auckland Weekly News*, 21 April 1888, p. 3; *Thames Advertiser*, 6 July 1888, p. 2.

<sup>9</sup> *Bell* (Auckland), n.d., reprinted in *Waikato Times*, 26 April 1888, p. 2.

<sup>10</sup> Downey, *Gold-Mines of the Hauraki District*, p. 255.

<sup>11</sup> *Te Aroha News*, 14 April 1888, p. 2, 12 May 1888, p. 7.

<sup>12</sup> *Thames Star*, 20 July 1882, p. 2, 21 July 1882, p. 2, 27 July 1882, p. 2; *Thames Advertiser*, 25 July 1882, p. 2; *Auckland Weekly News*, 29 July 1882, p. 9.

- <sup>13</sup> 'Piako County Council', *Te Aroha News*, 29 January 1887, p. 2, 18 June 1887, p. 2; H.A. Gordon to Under-Secretary, Mines Department, 1 May 1888, *Appendices to the Journals of the House of Representatives* [hereafter *AJHR*], 1888, C-5, p. 29.
- <sup>14</sup> Editorial, *Te Aroha News*, 15 January 1887, p. 2; H.A. Stratford to Minister of Mines, 2 February 1887, Mines Department, MD1, 87/89, ANZ-W.
- <sup>15</sup> *Sydney Morning Herald*, 29 May 1900, p. 6; *Bulletin*, 16 June 1900, p. 13; Roy Bridges, *From Silver to Steel: the romance of the Broken Hill Proprietary*, Melbourne, 1920, pp. 44, 46-47, 74, 89, 92, 144, 146-147, 176; Geoffrey Blainey, *The Rise of Broken Hill*, Melbourne, 1968, pp. 39-40.
- <sup>16</sup> Bridges, *From Silver to Steel*, p. 174.
- <sup>17</sup> *Te Aroha News*, 14 April 1888, p. 2; H.A. Gordon to Minister of Mines, 1 June 1890, *AJHR*, 1890, C-3, p. 42.
- <sup>18</sup> Raymond Radclyffe, *Wealth and Wild Cats: travels and researches in the gold-fields of Western Australia and New Zealand*, London, 1898, p. 113.
- <sup>19</sup> Editorial, *Waikato Times*, 22 March 1888, p. 2.
- <sup>20</sup> Editorial, *New Zealand Herald*, 23 March 1888, p. 4; *Te Aroha News*, 1 September 1888, p. 2.
- <sup>21</sup> *Age*, 29 May 1900, p. 6; *Auckland Weekly News*, 31 March 1888, p. 21.
- <sup>22</sup> *Auckland Star*, 21 March 1888, p. 8; *Te Aroha News*, 24 March 1888, p. 8; *Auckland Weekly News*, 31 March 1888, p. 21.
- <sup>23</sup> *Te Aroha News*, 8 January 1890, p. 2, 25 January 1890, p. 2, 4 June 1890, p. 2; *Observer*, 11 January 1890, p. 6, 18 August 1892, p. 12; 'Mercutio', 'Local Gossip', *Auckland Weekly News*, 14 November 1891, p. 7; *Sydney Morning Herald*, 29 May 1900, p. 6; *Thames Star*, 20 June 1900, p. 2.
- <sup>24</sup> *Te Aroha News*, 21 March 1888, p. 2.
- <sup>25</sup> *Ibid.*, 21 April 1888, p. 4, 25 April 1888, p. 3.
- <sup>26</sup> *Thames Advertiser*, 22 March 1888, p. 2; *Te Aroha News*, 24 March 1888, p. 2.
- <sup>27</sup> *Te Aroha News*, 24 March 1888, p. 2.
- <sup>28</sup> *Ibid.*, Editorial, 24 March 1888, p. 2.
- <sup>29</sup> *New Zealand Herald*, 23 March 1888, p. 5.
- <sup>30</sup> *Te Aroha News*, 14 April 1888, p. 2, 25 April 1888, p. 3.
- <sup>31</sup> F.W. Pulleine, *The Australasian Mining Directory*, Adelaide, 1888, p. 397; *Evening News* (Sydney), 4 June 1889, p. 2.
- <sup>32</sup> Prospectus of Te Aroha Silver and Gold Mining Company, *Te Aroha News*, 21 April 1888, p. 4.
- <sup>33</sup> *Bell*, n.d., reprinted in *Waikato Times*, 26 April 1888, p. 2.
- <sup>34</sup> Pulleine, *The Australasian Mining Directory*, p. 397; 'Memorandum of Association and Articles of Association', p. 19; Share Register of Te Aroha Silver and Gold Mining Company, 30 November 1889, Company Files, VPRS 932, Victorian Public Record Office, Melbourne [Vic. PRO].
- <sup>35</sup> *New Zealand Herald*, 23 March 1888, p. 5.
- <sup>36</sup> W.R. Wilson to Edwin Mitchelson, 6 January 1890, Mines Department, MD1, 90/119, ANZ-W.
- <sup>37</sup> *Te Aroha News*, 14 November 1888, p. 2, 9 November 1889, p. 7; H.A. Gordon to Under-Secretary, Mines Department, 8 June 1889, *AJHR*, 1889, C-2, p. 44; *New Zealand Mining Handbook*, Wellington, 1906, p. 27; Bridges, p. 176.
- <sup>38</sup> *Te Aroha News*, 19 May 1888, p. 2.
- <sup>39</sup> *Ibid.*, 27 June 1888, p. 2.
- <sup>40</sup> *Ibid.*, 9 November 1889, p. 7; *Waikato Times*, 7 July 1888, p. 2.
- <sup>41</sup> *Te Aroha News*, 30 June 1888, p. 2, 21 July 1888, p. 2, 28 July 1888, p. 2, 8 August 1888, p. 2, 1 September 1888, p. 2; F.D. Brown [Professor of Chemistry at Auckland University College] to Minister of Mines, 28 July 1888, Mines Department, MD1, 89/843, ANZ-W.
- <sup>42</sup> *Auckland Weekly News*, 14 July 1888, p. 30.
- <sup>43</sup> *Te Aroha News*, 7 July 1888, p. 2, 11 July 1888, p. 2, 14 July 1888, p. 2.
- <sup>44</sup> *Ibid.*, 1 September 1888, p. 2.
- <sup>45</sup> *Ibid.*, 24 March 1888, p. 2, 11 April 1888, p. 2, 13 April 1889, p. 2; H.A. Gordon to Minister of Mines, 8 June 1893, *AJHR*, 1889, C-2, p. 45.
- <sup>46</sup> *Te Aroha News*, 28 March 1888, p. 2; *Waikato Times*, 11 October 1888, p. 3.
- <sup>47</sup> George Wilson to Under-Secretary, Mines Department, 4 April 1888, *AJHR*, 1888, C-6, pp. 11, 12.
- <sup>48</sup> *Waikato Times*, 27 March 1888, p. 2; 5 April 1888, p. 2; 14 April 1888, p. 2.
- <sup>49</sup> *Ibid.*, 21 April 1888, p. 2; 28 April 1888, p. 2; 12 May 1888, p. 2; 23 June 1888, p. 2; George Wilson to Warden, 2 July 1888, Inspector of Mines, Letterbook 1888-1892, p. 52, YZAB 1240/1, ANZ-A.
- <sup>50</sup> *Te Aroha News*, 1 August 1888, p. 2; 4 August 1888, p. 2; 22 December 1888, p. 2; 26 January 1889, p. 2.
- <sup>51</sup> George Wilson to Under-Secretary, Mines Department, 25 April 1889, *AJHR*, 1889, C-2, p. 101; H.W. Northcroft to Under-Secretary, Mines Department, 26 April 1890, *AJHR*, 1890, C-3, Appendix 1, p. 149; H.A. Gordon to Minister of Mines, 1 June 1890, *AJHR*, 1890, C-3, p. 43.

- <sup>52</sup> *Te Aroha News*, 6 February 1889, p. 2, 5 June 1889, p. 2, editorial, 20 July 1895, p. 2.
- <sup>53</sup> *Ibid.*, 1 September 1888, p. 2; H.A. Gordon to Under-Secretary, Mines Department, 8 June 1889, *AJHR*, 1889, C-2, p. 44; H.A. Gordon to Minister of Mines, 1 June 1890, *AJHR*, 1890, C-3, p. 43; J.M. Clark, contribution to discussion of George J. Binns, 'Mining in New Zealand', *Transactions of the Federated Mining Engineers*, vol. 3, 1891-1892, p. 670.
- <sup>54</sup> *Te Aroha News*, 1 September 1888, p. 2, 13 October 1888, p. 2.
- <sup>55</sup> H.A. Gordon to Under-Secretary, Mines Department, 8 June 1889, *AJHR*, 1889, C-2, p. 45.
- <sup>56</sup> Share Register of Te Aroha Silver and Gold Mining Company, Company Files, VPRS 932, Vic. PRO.
- <sup>57</sup> J.A.H., 'A Glance at Maoriland', *Evening News*, 4 June 1889, p. 3.
- <sup>58</sup> *Te Aroha News*, 8 January 1890, p. 2.
- <sup>59</sup> Our Special Reporter, 'Te Aroha and Waiorongomai', *Waikato Times*, 11 October 1888, p. 3.
- <sup>60</sup> *Ibid.*, 4 October 1888, p. 2.
- <sup>61</sup> Editorials, *Te Aroha News*, 1 September 1888, p. 2, 20 October 1888, p. 2.
- <sup>62</sup> J.A.H., 'A Glance at Maoriland', *Evening News*, 4 June 1889, p. 3.
- <sup>63</sup> *Waikato Times*, 4 December 1888, p. 2; *Te Aroha News*, 8 December 1888, p. 2.
- <sup>64</sup> *Waikato Times*, 23 May 1889, p. 2, 7 September 1889, p. 2; *Te Aroha News*, 16 November 1889, p. 2.
- <sup>65</sup> *Ibid.*, Editorial, 9 November 1889, p. 2.
- <sup>66</sup> *Ibid.*, 22 June 1889, p. 2; 6 July 1889, p. 2; 27 July 1889, p. 2; 3 August 1889, p. 2; H.A. Gordon to Minister of Mines, 1 June 1890, *AJHR*, 1890, C-3, p. 44.
- <sup>67</sup> *Te Aroha News*, 13 July 1889, p. 2.
- <sup>68</sup> *Ibid.*, 17 April 1889, p. 2, 22 May 1889, p. 2; Share Register of Te Aroha Silver and Gold Mining Company, Company Files, VPRS 932, Vic. PRO.
- <sup>69</sup> *Te Aroha News*, 26 September 1888, p. 2, 23 October 1889, p. 2.
- <sup>70</sup> *Ibid.*, 6 November 1889, p. 2, 12 March 1890, p. 2; letter from William Adams, Jr., *Auckland Weekly News*, 14 December 1889, p. 9; H.A. Gordon to Under-Secretary, Mines Department, 26 January 1890, Mines Department, MD1. 6/4/31, ANZ-W.
- <sup>71</sup> *Te Aroha News*, 7 September 1889, p. 2; H.A. Gordon to Minister of Mines, 1 June 1890, *AJHR*, 1890, C-3, p. 45.
- <sup>72</sup> *Te Aroha News*, 21 December 1889, p. 2.
- <sup>73</sup> John Howell and W.H. Patton to W.R. Wilson, 13 December 1889, Mines Department, MD1, 90/119, ANZ-W.
- <sup>74</sup> *Te Aroha News*, 20 November 1889, Special Edition, p. 2.
- <sup>75</sup> H.W. Northcroft to Under-Secretary, Mines Department, 26 April 1890, *AJHR*, 1890, C-3, Appendix 1, pp. 137-138.
- <sup>76</sup> *Te Aroha News*, 9 November 1889, p. 2; 23 November 1889, p. 2; 15 January 1890, p. 2; H.W. Northcroft to Under-Secretary, Mines Department, 26 April 1890, *AJHR*, 1890, C-3, Appendix 1, p. 136.
- <sup>77</sup> H.W. Northcroft to Under-Secretary, Mines Department, 26 April 1890, *AJHR*, 1890, C-3, Appendix 1, p. 149.
- <sup>78</sup> *Te Aroha News*, 18 September 1889, p. 2; Waiorongomai Correspondent, *Thames Star*, 19 September 1889, p. 2; Waiorongomai Correspondent, *Waikato Times*, 21 September 1889, p. 2; 28 September 1889, p. 2.
- <sup>79</sup> Bridges, *From Silver to Steel*, pp. 174-176.
- <sup>80</sup> *Te Aroha News*, 12 October 1889, p. 2; *Auckland Weekly News*, 12 October 1889, p. 22.
- <sup>81</sup> *Te Aroha News*, 2 November 1889, p. 2.
- <sup>82</sup> *Waikato Times*, 9 November 1889, p. 2; *Te Aroha News*, 9 November 1889, p. 2.
- <sup>83</sup> Editorial, *Ibid.*, 9 November 1889, p. 2.
- <sup>84</sup> *Ibid.*, 21 December 1889, p. 2.
- <sup>85</sup> *Ibid.*, 8 January 1890, p. 2.
- <sup>86</sup> John Howell and W.H. Patton to W.R. Wilson, 13 December 1889, Mines Department, MD1, 90/119, ANZ-W.
- <sup>87</sup> J.M. Clark to Minister of Mines, 7 October 1889, Mines Department, MD1, 90/119, ANZ-W.
- <sup>88</sup> W.R. Wilson to Edwin Mitchelson, 6 January 1890, Mines Department, MD1, 90/119, ANZ-W.
- <sup>89</sup> Te Aroha Correspondent, *Waikato Times*, 9 January 1890, p. 2; Hamilton Correspondent, *Auckland Weekly News*, 1 February 1890, p. 13.
- <sup>90</sup> Editorial, *Te Aroha News*, 9 November 1889, p. 2; Te Aroha Correspondent, *Waikato Times*, 9 January 1890, p. 2; Peter Ferguson to Premier, January 1890 [date lost because of water damage], Mines Department, MD1, 90/119, ANZ-W; Hamilton Correspondent, *Auckland Weekly News*, 1 February 1890, p. 13.
- <sup>91</sup> H.A. Gordon to Under-Secretary, Mines Department, 24 February 1890, Mines Department, MD1, 90/119, ANZ-W.

- <sup>92</sup> Memoranda of 3 March 1890; Minister of Mines to W.R. Wilson, 3 March 1890, Mines Department, MD1, 90/119, ANZ-A.
- <sup>93</sup> Letter from W.A. Murray, *Te Aroha News*, 30 April 1890, p. 2; W.A. Murray to Colonial Secretary, 5 May 1890; memoranda of 10, 14 May 1890; Under-Secretary, Mines Department, to W.A. Murray, 14 May 1890, Mines Department, MD1, 90/119, ANZ-W; *Te Aroha News*, 4 June 1890, p. 2 & editorial, 12 July 1890, p. 2.
- <sup>94</sup> *Ibid.*, 26 October 1889, p. 2; 12 March 1890, p. 2; *Waikato Times*, 9 November 1889, p. 2; *Thames Advertiser*, 13 January 1890, p. 4.
- <sup>95</sup> Te Aroha Warden's Court, Hearings 1883-1900, Applications 1-10, 16, 22-31, 34, 45-55 of 1890, BBAV 11505/1a, ANZ-A; Te Aroha Correspondent, *Auckland Weekly News*, 5 July 1890, p. 21; *Thames Star*, 28 July 1890, p. 4, 11 August 1890, p. 2.
- <sup>96</sup> *Waikato Times*, 12 July 1890, p. 2; letter from 'Fair Play', *Thames Star*, 26 July 1890, p. 4.
- <sup>97</sup> *Te Aroha News*, 14 June 1890, p. 2.
- <sup>98</sup> 'Te Aroha Warden's Court', *Thames Star*, 28 October 1890, p. 2; *Waikato Times*, 30 October 1890, p. 2.
- <sup>99</sup> *Thames Star*, 31 October 1890, p. 2.
- <sup>100</sup> *Ibid.*, 4 December 1890, p. 2.
- <sup>101</sup> *Ibid.*, 8 December 1890, p. 2; *Waikato Times*, 9 December 1890, p. 2; *AJHR*, 1891, C-4, p. 42.
- <sup>102</sup> Notice by Secretary, Te Aroha Silver and Gold Mining Company, n.d. [February 1891], Company Files, VPRS 932, Vic. PRO.
- <sup>103</sup> *Te Aroha News*, 29 January 1890, p. 2; Te Aroha Correspondent, *Waikato Times*, 20 February 1890, p. 2.
- <sup>104</sup> *Brett's Auckland Almanac, Provincial Handbook, and Strangers' Vade Mecum for 1896*, Auckland, 1896, p. 142.
- <sup>105</sup> H.A. Gordon to Minister of Mines, 8 June 1893, *AJHR*, 1893, C-3, p. 72.
- <sup>106</sup> H.A. Gordon to Under-Secretary, Mines Department, 24 February 1890, Mines Department, MD1, 90/119, ANZ-W.
- <sup>107</sup> H.A. Gordon to Minister of Mines, 1 June 1890, *AJHR*, 1890, C-3, p. 46.
- <sup>108</sup> Henderson, *The Geology of the Aroha Subdivision*, p. 14.
- <sup>109</sup> Clark, 'Mining in New Zealand', pp. 670-671.
- <sup>110</sup> *New Zealand Mining Handbook*, Wellington, 1906, p. 27.
- <sup>111</sup> Editorial, *Te Aroha News*, 20 July 1895, p. 2; *Auckland Weekly News*, 7 August 1897, p. 13.
- <sup>112</sup> Editorial, *Te Aroha News*, 20 July 1895, p. 2.
- <sup>113</sup> Sybil M. Jack, 'The Introduction of Cyaniding in New Zealand: a case study in the role of technology in history', *Prometheus*, vol. 2, no. 1, June 1984, p. 27.
- <sup>114</sup> H.A. Gordon to Minister of Mines, 1 June 1890, *AJHR*, 1890, C-3, p. 42.
- <sup>115</sup> H.A. Gordon to Minister of Mines, 8 June 1893, *AJHR*, 1893, C-3, p. 72. For examples of its prospecting, see *Te Aroha News*, 21 April 1888, p. 2; 28 April 1888, p. 2, 12 May 1888, p. 2; 23 June 1888, p. 2; 20 April 1889, p. 2, 5 June 1889, p. 2, 15 June 1889, p. 2.
- <sup>116</sup> *Ibid.*, 5 April 1890, p. 2; *Auckland Weekly News*, 16 May 1891, p. 30.
- <sup>117</sup> 'Aboriginal', 'General Notes', *Thames Advertiser*, 8 May 1891, p. 2.
- <sup>118</sup> 'Obadiah', 'Shares and Mining', *Observer*, 14 February 1891, p. 15.
- <sup>119</sup> *New Zealand Herald*, 23 March 1888, p. 5; Special Reporter, *Waikato Times*, 11 October 1888, p. 3.
- <sup>120</sup> Editorial, *Te Aroha News*, 9 November 1889, p. 2.
- <sup>121</sup> H.A. Gordon to Under-Secretary, Mines Department, 24 February 1890, Mines Department, MD1, 90/119, ANZ-W.
- <sup>122</sup> Bank of New Zealand, Board Minute Book no. 3, Minutes of Meeting held on 21 May 1889, Bank of New Zealand Archives, Wellington; *Auckland Weekly News*, 1 November 1890, p. 10.
- <sup>123</sup> *Te Aroha News*, 8 December 1888, p. 7, 13 April 1889, p. 7, 18 May 1889, p. 7, 13 July 1889, p. 7, 2 October 1889, p. 2; Waiorongomai Correspondent, *Waikato Times*, 21 September 1889, p. 2; Share Register of Te Aroha Silver and Gold Mining Company, 30 November 1889, Company Files, VPRS 932, Vic. PRO.
- <sup>124</sup> *Te Aroha News*, 5 April 1890, p. 2.
- <sup>125</sup> *Ibid.*, Editorial, 23 February 1895, p. 2.
- <sup>126</sup> H.A. Gordon to Minister of Mines, 8 June 1893, *AJHR*, 1893, C-3, p. 72.
- <sup>127</sup> *Thames Advertiser*, 13 March 1890, p. 2.
- <sup>128</sup> *Ibid.*, 25 July 1895, p. 3.
- <sup>129</sup> *Mining Standard*, n.d., reprinted in *Thames Advertiser*, 25 July 1895, p. 3; Austin Sprake, *Londonderry: the golden hole*, Carlisle, Western Australia, 1991, pp. 9, 80, 187.
- <sup>130</sup> For example, *Auckland Weekly News*, 4 May 1895, p. 14; *Thames Advertiser*, 12 June 1895, p. 2; *Observer*, 22 June 1895, p. 2.

---

<sup>131</sup> 'Obadiah', 'Shares and Mining', *Observer*, 6 June 1896, p. 7.

<sup>132</sup> *Ohinemuri Gazette*, 9 June 1897, p. 3.

<sup>133</sup> Te Aroha Correspondent, *Waikato Argus*, 25 March 1897, p. 4; *Thames Advertiser*, 24 July 1899, p. 2; List of Shareholders in the Montezuma Gold Mining Company on 28 December 1898, Company Files, BT 31/7207/50975, Public Record Office, London.

<sup>134</sup> For example, *Ohinemuri Gazette*, 15 June 1903, p. 2, 6 July 1903, p. 2, 15 July 1903, p. 2; J. Lacy to A. Vowles, 21 December 1910, Te Aroha Warden's Court, Mining Applications 1911, 1911/2, BCDG 11288/4a, ANZ-A.

<sup>135</sup> J.W. McCoy to Inspector of Mines, 11 February 1931, Inspector of Mines, BBDO A902, MM8, ANZ-A; J.W. McCoy to Under-Secretary, Mines Department, 16 October 1931; Gilchrist Son and Burns to Under-Secretary, Mines Department, 19 October 1931, Mines Department, MD1, 10/7/23, ANZ-W.

<sup>136</sup> For details of the extremely varied output of all mines in the Hauraki district, see Downey, pp. 265-289.

<sup>137</sup> *Thames Advertiser*, 25 December 1883, p. 2; 1 May 1884, p. 2; 25 July 1884, p. 2; *Thames Star*, 31 December 1884, p. 2; *New Zealand Industrial Gazette*, 20 April 1884, p. 14; *Te Aroha News*, 3 July 1886, p. 2.

<sup>138</sup> Editorial, *Ibid.*, 23 February 1895, p. 2.