

John Moffat - the Broken Hill Proprietary Co. Ltd, and Establishment of the Chillagoe Smelters, Queensland

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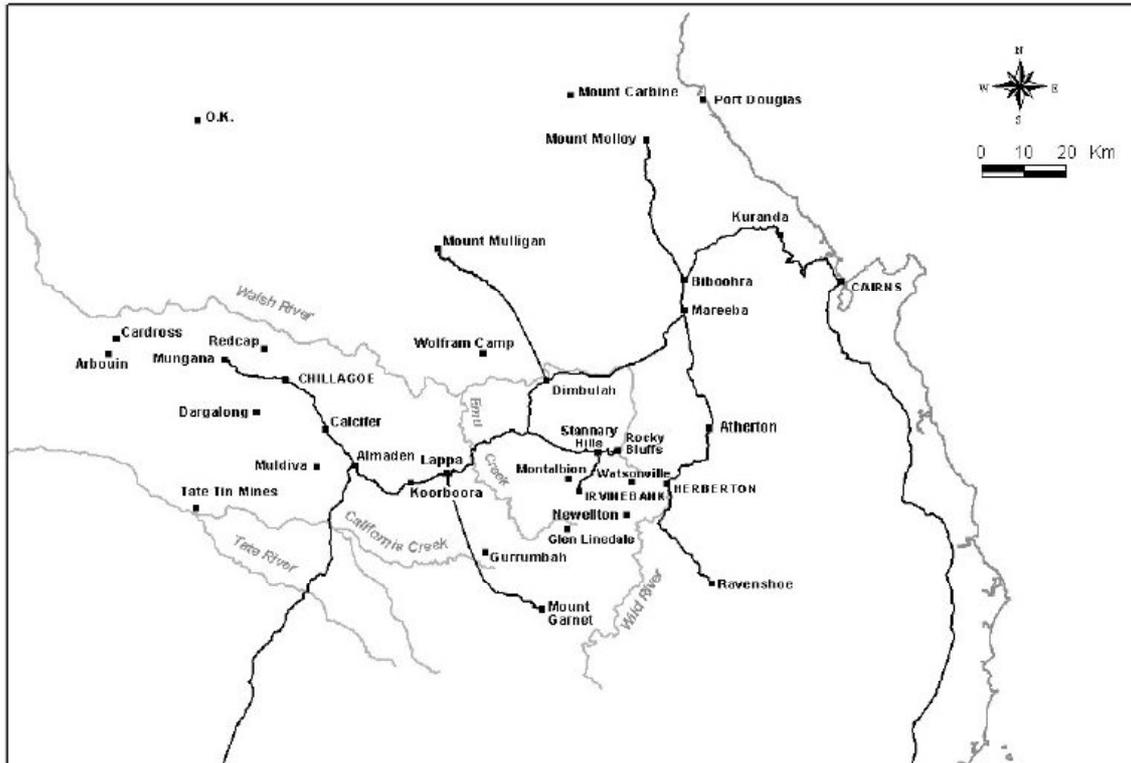
Within 15 years of the discovery of Broken Hill in 1883, there was a revival of base metals in Australia, with the Broken Hillionaires promoting the new fields on the stock exchange. Directors, William Knox, William Orr, James Smith Reid, H.F.C. Keats, and metallurgist, Herman Schlapp, led the way when explaining the rich investment opportunities in north Australia associated with Chillagoe, Mount Garnet and Cloncurry copper deposits. In 1896, the Broken Hill Proprietary Company Limited (BHP) directors met with John Moffat of Irvinebank who was keen to promote his mining properties in order to realise his vision of enhancing North Queensland's development and industrialization. John Moffat had immigrated to Queensland in 1862, became a Brisbane storekeeper in 1867, went to Stanthorpe and the New England tinfields as a storekeeper in 1872, ventured into tin smelting, suffered insolvency in 1876 and went to north Queensland in 1880. He developed a major base metal mining empire across north Queensland, privately funding infrastructure after promoting his mining investments into public companies.¹ The Chillagoe copper, silver, lead, zinc deposits were just one such an opportunity that Moffat promoted to southerners.

This paper analyses the role of certain directors of BHP in the formation and initial development of the Chillagoe field. It looks at the behaviour of those directors in selling vendor shares and outlines human behaviour standards that constituted a common form of investment promotion practice in the nineteenth century. The speculative opportunity in Chillagoe shares is set in the context of other major mining developments in Australia at Broken Hill, Mount Lyell and Mount Morgan.

The Chillagoe field discovered in 1887 accompanied significant discoveries and developments of Australia's other great gold and base metal mines around that time. In 1886 Broken Hill had just opened its smelters, Mount Morgan Gold Mining Company was formed as a public company, and Mount Lyell mine was discovered in 1887. In 1888 Mount Morgan Gold Mining Company paid £1.2 million in dividends, silver was booming on stock markets and BHP £19 shares were selling at their peak of £410 each.²

The BHP company reached the £1 million mark in annual dividend payments in 1891 and 1892 and produced nearly all of New South Wales' silver production valued at £3.5 million in 1892, just before silver prices collapsed.

Map 1: *North Queensland, showing mining locations.*



Source: Compiled by Vlatka Varagic, Department of Natural Resources, Mines and Energy, Qld.

Courting development

John Moffatt, enjoying monopoly control in his pegging of leases on the Chillagoe field, approached BHP as well as the South Australian copper captains to purchase these prospects so that they could be adequately developed. Moffatt was also in the process of selling his Mount Albion silver mines and smelters on the British market at a price that made him a millionaire.

There being no inland transport infrastructure west of Cairns proved a frustration for Moffatt's grand plans to develop the area's mines and smelters. A protracted public and bureaucratic debate ensued over the selection of Cairns as the port for the railway to the Herberton, Walsh and Tinaroo tinfields where Moffatt held extensive mining interests. In 1887 the construction had barely commenced on the ascent of the Cairns Range but by 1891, contractor John Robb had completed the railway to Myola, just

beyond Kuranda. The railway project struggled through the depression of the early 1890s, reaching Granite Creek (Mareeba) in 1894.

John Moffat tried again in 1892 to develop the Chillagoe field by means of the Land Grant Railway Scheme whereby the government was prepared to grant adjacent land in return for construction of a railway. He had a line surveyed, but failed to obtain finance for the project. His optimism and tenacity enabled the prospects to be resurrected again in 1894 when Moffat established a copper smelter at Calcifer, eight miles [13km] east of Chillagoe head station. He succeeded in smelting the copper and expanded again in 1896 with a small copper smelter at Girofla amidst the Mungana mines.³

At this time, Broken Hill was experiencing smelting complications and 'creep' movement in the ground. They had appointed American, Herman Schlapp of Colorado who created the largest metal smelters in Australia. However, by 1892 the aura around Broken Hill had diminished somewhat as ore reserves were drastically cut back. Prices of silver and lead spiralled downwards and the company drifted until General-Manager, Delpratt, discovered the flotation process in 1900.⁴ It is thus understandable that the BHP directors looked for new resources in the 1890s. Meanwhile, the potential of the Mount Morgan copper resource had lain unrecognised following the mine's opening in 1882. Even the American engineer, T.A. Rickard, missed its significance on his visit in 1891. It wasn't until 1901, a difficult time for the gold operation, that the company commenced its precipitation plant there, and produced copper.⁵

The discovery of the Mount Lyell gold mine and Chillagoe copper field occurred at the same time. Dr J.R. Robertson, consultant, medical practitioner and coalmine owner, extolled the copper prospects of Mount Lyell in 1887.⁶ He was ignored. When silver boomed in 1887-1888, Broken Hill investors went south to look at the Tasmanian west coast, with BHP directors, Bowes Kelly and William Orr visiting Mount Lyell in 1891 to take samples. Herman Schlapp assayed them and confirmed Robertson's positive opinion of the deeper copper deposit and they bought the mine.⁷ By 1896, at the time when Mount Lyell's copper furnaces were blown in, the wild boom in shares stimulated their interest more broadly to north Australia, at Chillagoe.

Melbourne investors had been aware of the Chillagoe field's potential since Moffat first approached them in 1888. Several reports by the Queensland Geological Survey office in the 1890s, by S.B.J. Sketchley in 1896 and Robert Logan Jack in 1891 and 1898, emphasised the need for capital.⁸ By 1897 Moffat had substantial profits to

show - £13,528 of income in one year alone from the Chillagoe field which yielded 31,992 ounces of silver, 250 tons of lead bullion, 147 tons of copper and an unidentified amount of the ubiquitous gold.⁹

There were some early nibbles at Moffat's Chillagoe prospects. Two Melbourne company directors, Sir Malcolm McEacharn, the shipping and mining magnate, and Charles Chapman, a director in the Adelaide Dry Creek Works, came north in July 1896. Moffat drove them to both Chillagoe and Mount Garnet to inspect the prospects and he informed them that Chillagoe was already on offer to another group and he withdrew Mount Garnet from consideration. However, McEacharn rejected both as useless without construction of a government railway. He informed Moffat 'that he thought there was nothing in the mines by way of profit to any parties investing in them, or promoting companies to acquire them'.¹⁰

Clinching the deal

A year later, a Melbourne sharebroker, Ralph G. Johnson, came to North Queensland to inspect these properties on behalf of James Smith Reid of Broken Hill who was acting for himself, McEacharn, Charles Chapman, and Broken Hill and Mount Lyell director and president of the Victorian Chamber of Mines, William Knox, who had been interested in Chillagoe since 1896. Securing the support of such reputable promoters was a great coup by Moffat.¹¹ James Smith Reid had been a journalist and was then a railway and company promoter. He was apprenticed at the *Port Denison Times* in Bowen and had launched newspapers in Ravenswood in 1870, Charters Towers 1872, Cooktown 1874 and Thornborough 1876. He left Queensland in 1880 for western New South Wales and established the *Silver Age* in Broken Hill in 1884, so recording the rise of Broken Hill. The boom at Broken Hill launched him on his career as a promoter, floating the Tarrawingie Flux Company, Silverton Tramway Company, Mount Burgess Gold Mines, Euriowrie Tinfields, the Sulphide Corporation, and the Emu Bay Railway Company in Tasmania. Simultaneously he had been endeavouring to float the Cloncurry copperfield in north west Queensland that included a smelter and privately owned railway to a port on the Gulf of Carpentaria, but without success. For most of his working life he lived as an absentee capitalist at his *Rostrevor* mansion near Adelaide and had an office in Queen Street, Melbourne.¹²

Moffat had tremendous leverage in negotiating with Reid while the Mount Lyell boom raged because of Reid's past involvement in the north.¹³ Reid and Moffat floated the Chillagoe properties using the Chillagoe Proprietary Company to which Reid induced some of the most reputable members of the Australian mining fraternity to be subscribers. Besides Knox they included McEacharn who was the chairman of the McIlwraith, McEacharn, Victorian shipping line, a director of Cobar Chesney Copper and Gold Company, as well as a director of Burns Philp that was a major Queensland and Pacific Islands commercial firm with investments in numerous regional centres; Alfred Tolhurst, a leading Melbourne sharebroker; Thomas Rollason, a Melbourne broker and accountant; and previously mentioned metallurgist Herman Schlapp of Broken Hill fame. Moffat went to Melbourne in the spring of 1897 and met with Knox and Reid for the first time. He sensed McEacharn's antagonism throughout the discussions based on his visit to the mines, but Chapman's influence and persuasion clinched Moffat's agreement, otherwise he would have withdrawn the properties from sale and hawked them elsewhere.¹⁴

The syndicate planned to invest £300,000 in the mines and smelters and in a private railway from Mareeba, on which the whole venture depended. The initial company had a nominal capital of £96,000 in 480 shares and by agreement, Reid and Chapman acquired Moffat's properties on 29 October 1897 for £20,000 plus 160 shares valued at £200 each in the Chillagoe Proprietary Company. The promoters, Reid and Chapman, together obtained 120 paid up shares and 200 shares paid to £100.¹⁵ Swift and decisive action was then necessary in Queensland Parliament before the pre-Christmas adjournment to legitimize the railway proposal and to prepare for the company float. Both Reid and Chapman accompanied Moffat to Brisbane in mid-November 1897 to present the proposal. Together they convinced a conservative government eager to redeem its image after the Queensland National Bank scandal in 1896-1897 to pledge its sincerity in a program of railway and harbour construction.¹⁶ Moffat's political and social connections with Queensland commerce were enormously beneficial. He had a legion of friends in the Queensland Parliament across all political groupings. He had been approached to accept nomination as a candidate in 1886 but he recommended Robert Philp for the seat of Musgrave based on Townsville and its hinterland. Robert Philp; Atherton Tableland storekeepers John Newell of Jack and Newell; Brisbane solicitor Andrew Thynne; and Isodor Lissner of Charters Towers, all politicians, lobbied members of both chambers to give the Mareeba to Chillagoe

Railway Bill swift passage in December 1897, without the usual formalities.¹⁷ The Chillagoe Proprietary Company was empowered to build within three years a 95 mile [153km] railway for £431,000, subject only to a government right of purchase after 50 years. The *Mareeba to Chillagoe Railway Act 1897* also granted the proprietors 50 acre leases and up to a maximum of 2,000 acres [20.2 up to 809 hectares], at £1 an acre with favourable labour conditions, permission to erect central smelters at Barron Falls and the lease of a wharf at Cairns, complete with railway siding. These preferential conditions aroused the suspicion and the wrath of Labor members, who branded the promoters and Philp as monopoly capitalists.¹⁸ All negotiations were conducted secretly - not even the leading mining press knew what was planned. On 9 December 1897 when the second reading debate was underway in the Queensland Parliament, the *Australian Mining Standard* remarked that 'everything connected with mining is extremely dull in Brisbane at the present time. That city seems to have had more than its fair share of wild cats and duffers',¹⁹ but when the Act and the Chillagoe Proprietary Company's plans became public, the *Australian Mining Standard* lauded it as the largest and most liberal mining and railway concession yet granted in the Australian colonies.²⁰

The Labor members were evidently unaware of Moffat's project co-ordination role. Labor members praised Moffat for holding the leases, thus preventing intervention by French, German and Belgian syndicates.²¹ According to the Labor member for Charters Towers, Anderson Dawson, Moffat was the soundest mining entrepreneur in the North.²² They knew Moffat's virtue lay in amassing money and spending it on local development, maintaining full employment and supporting towns at every outpost of his empire. Philp excused the haste of the Bill, praising Moffat's pioneering efforts for controlling the progress of Northern mining and also his stated desire of retiring to Sydney.²³ This disguised Moffat's real intention of selling the mines to southern magnates and speculating on the share market.

James S. Reid was fully occupied with the corporate details of financing the railway, mining and smelting infrastructure, while Moffat returned to Irvinebank as representative of the Chillagoe Proprietary Company. Within six months the directors were floating a new company, Chillagoe Railway and Mines Limited to acquire the assets of the Chillagoe Proprietary Company. The new company was incorporated on 16 June 1898 in Melbourne and commenced operations on 1 July. Of the 900,000 £2 shares, 480,000 fully paid and 100,000 paid to £1 were allotted to the vendors. Each

proprietary company shareholder received 1,000 shares in the new company for each old company share. No prospectus was issued and, to provide working capital, Reid obtained approval to issue £100,000 in shares paid to £1.²⁴ Meanwhile Schlapp and Stewart, respectively metallurgist and manager at Broken Hill, were reporting enthusiastically on the whole Chillagoe field. The greatest stumbling block in the whole project was, however, the smelter site. Reid found the Queensland public service far less pliable than either the share market or the politicians. The Barron Falls site was rejected, following opposition by Cairns residents and a report by the local Land Commissioner that it would desecrate the beauty of the falls and pollute Cairns water.²⁵ Chapman submitted an amended proposal in May 1898 for an aqueduct to a Mareeba site but to little effect. The matter stalled until almost a year later when Moffat personally conferred with the Lands Minister, James v. Chataway.

While Stewart and Schlapp were touring the field to promote the shares, James Reid was again courting the business acumen of Ralph G. Johnson, Melbourne sharebroker and director of Queensland Prospecting and Investment Company and of the Northern Queensland Minerals Development Corporation. Johnson confidently prophesied that the field was ‘destined to be one of the largest contributors to the copper output of the world’.²⁶ The Chillagoe directors' aim in 1898 was to boom share prices and then to float debentures on the British market to finance the railway and smelters.

Duping the public

To maintain public support, Moffat continued active smelting work at Calcifer and Girofla to provide cash flow and profits.²⁷ Most of the Irvinebank Mining Company's workforce of 160 was fully occupied. Moffat avoided making any ore estimations as he had been tricked by the bunchiness of lodes at Montalbion, Glen Linedale and Muldiva. By shifting second-hand machinery at ‘waste paper’ prices he could present the Chillagoe field as a paying proposition while pocketing vendor shares to ‘prove up’ the mines on the share market.²⁸ In contrast to Moffat's expenditure of £46,000 spent in nine years on cheap labour in minimal cost mines, machinery at giveaway auction prices, fluxes for nothing, ore raked off the surface and easy smelting of surface oxidized ores, the Broken Hill and Melbourne directors planned a railway and expensive plant and machinery to deal with the deeper refractory ores.²⁹

Both Reid and Moffat duped each other. To Reid and outsiders, Moffat's Chillagoe operations were a plucky battle with primitive conditions. The mines were

reportedly worked to only one per cent of their potential but still yielded profits to John Moffatt and Company in the face of the tick plague, rough tracks and high fuel costs.³⁰ Such tales fuelled rumours in the press and boosted prices. A former Assistant Queensland Government Geologist and promoter of some leases at Stannary Hills, S.B.J. Skertchley, announced that the richness of the field was under rather than over-estimated. He described five types of ore bodies - true fissure veins, carbonates or contact deposits, true lodes associated with dykes, impregnations from faults, and deposits in caves whose walls had been denuded.³¹ In his 1891 report, Robert Logan Jack had described some of the mines as 'cave deposits' rather than true fissure lodes. His term, 'cave deposits', alarmed many miners used to the term 'lodes', yet in his 1898 report Jack wrote that he was 'glad to find that my views of the value of the mining properties are in accord with those of such a high authority [as the newly appointed manager of the Chillagoe Company, Alex Stewart]'. When not a single shaft was down more than 100 feet, Stewart estimated the ore reserves in June 1898 to be 500,000 tons of 10 per cent ore.²⁵ This bold claim was to haunt the company throughout its existence.

Boomsters like W.S. Dowel, formerly of the New South Wales mining fields, swarmed the field using the word 'Chillagoe' in the names of their companies formed to trade in the district's leases.³² Moffatt and Reid could deal immediately in Chillagoe shares whereas rogues had to create plausible schemes to fleece fools.³³ The rogues' style was to trade options over a few acres of barren hillside. They were likely to be 'badly left' as there would be no one 'wiser' to sell to.³⁴ They took up granite and lime bluffs to adjoin 'Moffatt's blocks' but according to the editor of the *Wild River Times* writing on 26 July 1898, they might have struck the Suez Canal before finding any ore. Having hung on obstinately for so long, Moffatt was now mesmerized by the opportunities that the Broken Hill millionaires stimulated, even though cheerful predictions in the Chillagoe Proprietary Company's report to the end of June 1898 in keeping with the practice of the time, avoided any scientific assessment of the deposits. For intending speculators Stewart wrote: 'Immense deposits such as these may not be regarded as possessing the same permanence as true lodes, but there is no reason why they should not extend to very considerable depths'.³⁵

At this time when a new manager, Ernest Weinberg, managing director of Aldershot smelter near Maryborough in Queensland, was being recruited for Chillagoe smelters, Weinberg stated that Chillagoe shares were over-valued for the amount of

work done.³⁶ As the *Sydney Bulletin* had warned on 14 May 1898, the boom had burst in both Mount Lyell and Western Australian shares, so Chillagoe shares were prime for selling. Of the vendor's shares, 145 were held by Moffat personally and 15 by the Irvinebank Mining Company. With Chillagoe Proprietary company shares hitting £1,700 each, Moffat sold his vendor's shares mercilessly. The Irvinebank Mining Company and Moffat also juggled and made significant purchases and sales of shares in the Chillagoe company in the six months to 1 July 1898. Moffat transferred 120 of these Chillagoe shares to the Irvinebank Mining Company to bolster its corporate control. Apart from this, Moffat sold 15 fully paid shares to the public. The Irvinebank Mining Company also sold 24 of its fully paid shares to the public and together Moffat and his company sold 25 per cent of their shareholdings in less than six months.³⁷ Meanwhile, the £200 shares had surged to £1,900 each in response to the boomster tactics of James Reid, Dowel and Skertchley. Just like Moffat, Skertchley had mixed his speculative predictions with his moral responsibilities.³⁸ Assuming Moffat averaged £1,400 a share over the period, he undoubtedly struck it rich. Yet, this bonanza barely met the £46,000 development costs and bank overdrafts.³⁹

Moffat had succeeded in recouping his developmental costs and was keen for the southern directors to manage the corporate matters. Thus, at the end of the life of the Chillagoe Proprietary Company on 1 July 1898 and on the formation of the new company, Chillagoe Railway and Mines Limited, Moffat personally held far fewer shares than either the southern mining speculators or his co-directors. At the outset of the new company, directors' shareholdings comprised: Reid 62,198, Chapman 39,968, Knox 48,000 and Moffat 10,000, while the Irvinebank Mining Company held 119,000. Reid, Chapman and Knox held 26 per cent of the shares and the combined totals of other directors and southern speculators was 43 per cent, compared to Moffat's and the Irvinebank Mining Company's holding of 22 per cent.⁴⁰

Declining fortunes

Despite the optimism, the company's chances were impeded by delays involving political and legal decisions. Because the site for the smelters still had not been selected, Moffat appealed to Lands Minister, James v. Chataway, who agreed to expedite alienation of possible sites along Mervyn Creek above the Barron Gorge. The Commissioner for Railways agreed to allow a 48-year lease over the two 20 acre [8.1 hectares] sites from 1 January 1900. However, in the first week of December 1899,

Herbert Hardacre, energetic opponent of the whole Chillagoe scheme, was appointed Minister for Lands in the first Labor government in the world. The government only lasted a week but that proved enough time for Hardacre to quash the Barron Gorge smelter proposal, denouncing the £50,000 scheme to construct electrolytic copper treatment works as ‘nefarious and scandalous’.⁴¹ At Hardacre’s request, the new Crown Solicitor, Powers, reported on the lease arrangement, and declared it invalid under the *Land Act 1897*. The company was forced to establish smelters inland, accruing huge transport charges in a decade of rising fuel costs.⁴² To the mining fraternity, this was a reckless error, Queensland being strangled in its own red tape.⁴³ Reid and his co-directors never sought to remedy this blunder in a practical way and this became a decisive factor in the company's demise in smelting.

The venture was also dogged by ore supply problems. Because the first priority for both Reid and Moffat was to boost the company, neither would admit that there were no ore reserves. Moffat withdrew from the limelight but in order to attract publicity and share buyers, Reid advertised Stewart and Schlapp's report. Stewart gave an estimate of 500,000 tons of 10 per cent ore, which he declared had no metallurgical and treatment difficulties. However, the estimated smelting cost of 35 shillings a ton, was equal to Moffat's fuel costs alone.⁴⁴ Another deception was that Stewart's smelting costs were based on the guarantee of the smelters being sited at the Barron Falls, a fact not publicised.

Moffat cultivated a low profile during the Chillagoe boom. The Chillagoe board spent money lavishly, mining overseas investors' pockets ahead of the ore that lay amidst the limestone bluffs. Reid stimulated British share buying and herded Broken Hill men into ‘Chillagoes’ through the appointment of Stewart as manager at an annual salary of £1,500, a sum more than he earned at Broken Hill. James Reid who would not sell any of his own shares while he was ‘bulling’ the sharemarket also fostered new capital raisings to finance a branch railway towards Mount Garnet in support of Moffat's promotion of all his copper prospects there.⁴⁵

On his first trip to the Chillagoe field in July 1899 as Moffat's guest, James Reid noticed that caution rather than courage characterized the mining operations. Mining methods had hardly changed since Moffat had handed over control - no mines went beyond the windlass stage.⁴⁶ This did not matter to Reid, as he had Stewart's report and newspaper stories of eager experts like Skertchley and Dowel to trigger the share

market. Skertchley reported in April 1899 that there was one 'lode in sight of 5 per cent copper ore totaling 18,400,000 tons' in the Red Hill copper mine alone.⁴⁷ With such promotion, neither Reid nor Moffat could be targeted as excessive sharemarket boomsters. A timely warning came when an experienced Chillagoe miner, writing in the London *Mining Journal*, ridiculed Skertchley for having mistaken the limestone bluffs for copper and denounced his £60 million mine as a hoax.⁴⁸

A debenture issue was made on the London market in March 1899.⁴⁹ Listing on the London exchange followed in June, when 60,000 shares were under option to prominent London brokers. Reid thought both this and a further option float in September were sure to be taken, so providing £112,000 in ready capital.⁵⁰ The selling by southern directors and massive buying by Moffat and small investors then began. From a price of 32 shillings in Melbourne, when the shares were floated in London, they soared over the next six months to reach a peak of 48 shillings on 26 August 1899, but by Christmas they were down to 23s.9d. Moffat purchased 20,000 Chillagoe shares at the peak of the market, either for himself or as a trustee for small shareholders in North Queensland, or alternatively receiving Chillagoe shares as debt repayments. This was certainly a surprising investment by Moffat, considering his previous experience with floating public companies. His motives can only be guessed at - possibly further share speculation after the railway was built and central smelters opened at Barron Falls (as he still hoped) or even the possibility of a further company float of the successful Chillagoe Railway and Mines Company Limited. He would have been well aware from the transfer documents as to who was selling the shares, among who were co-directors Reid and Knox, who sold 23,000 and 2,000 shares respectively during the 10-week period that Moffat bought his shares. Thus, Moffat's action must be considered either financially naive or as a paternalistic and philanthropic act in buying shares in Queensland developments for Queenslanders.⁵¹ Moffat himself stated, 'the reason he had not exercised his right [to sell his shares] was probably an accident in his belief, as he always believed the property was a valuable one.' This suggests some conflict in his mind between his promotional strategies and the development of stable mining communities.⁵²

Moffat was a target for Reid and Knox in their manoeuvres to cash in on their shares. Reid gained around £50,000 by selling at approximately £2 and £2.5s a share, while Knox selling at £1.16s. to £2 gathered around £30,000. But Moffat and the North Queenslanders he represented squandered over £44,000 on the recommendation of an

ageing magnate's optimism. Never again did the share price reach these levels. Moffatt sold only 2,000 shares in two years, during which time his co-directors mined the sharemarket in mid-1899 and after June 1900 with shares peaking again at just above £1.18s.9d on 1 October 1900.⁵³ If Moffatt was the sole sponsor of this 20,000 share-purchase, then he paid out three times the profit he made on selling his vendor's shares in the Chillagoe Proprietary Company. It seems that Reid snared him when he still had large overdrafts with the Queensland National Bank.

Railway developments

After Stewart was appointed manager in July 1898, Moffatt deferred to James Reid as senior controller of the company.⁵⁴ Evidently, he trusted Reid to co-ordinate construction of the railway and smelter.⁵⁵ After the Labor Government torpedoed the Barron Falls hydro-electric scheme a site was selected on Chillagoe Creek between the chief mines. Reid quickly appointed reputable men, Richard Shepherd from Mount Lyell as construction engineer and J.M. Higgins from Dry Creek Works near Adelaide as superintendent.⁵⁶ To coincide with the opening of the railway, Reid ordered boiler and furnace equipment from the United States and brickmaking and construction began.⁵⁷

Archibald Smith Frew who had worked on the Normanton to Croydon railway supervised the railway. The Railway Department assisted by arranging rollingstock purchases including two B15 locomotives constructed by Walkers Limited for £2,629 each.⁵⁸ At Reid's direction Frew worked expeditiously,⁵⁹ hiring labourers on piecework and letting substantial sub-contract work.⁶⁰ Construction began in August 1898 and the line opened without ceremony as far as Lappa, 55 miles [88.5km] distant, on 1st October 1900. A temporary agreement allowed company traffic to take precedence, although the Railway Department operated the line as a government railway, except that freight rates were higher, based on the preferential conditions of the *Mareeba to Chillagoe Railway Act 1897*.⁶¹ When the line was officially opened to Chillagoe and Mungana on 4 March 1901, the 102-mile [164km] railway had cost £381,902.5s.⁶²

This was the first railway constructed anywhere within Moffatt's empire. He was impressed with government input for rollingstock and permanent way material.⁶³ Following intervention by the Railway Commissioner and from Chief Engineer, Henry C. Stanley, iron bridges were strengthened, notably across the Walsh River, stronger

timber for bridge girders and sleepers utilised, and easier gradients and wider cuttings established.⁶⁴ The result - a line with heavy 60-pound rail [27.2kg] to reduce maintenance costs has been vindicated over time.

On 31 December 1900, a special train with a saloon car carrying the Mining Warden and special guests travelled to within three miles [4.8km] of Chillagoe at 25 miles [40.2km] an hour, declaring the line to be one of the most attractive tourist lines in Queensland.⁶⁵ Would-be residents and sharp speculators did not wait for completion of the railway. They went by train to the head of the line at the 73-mile point [117.5km], then were taken to Chillagoe in buggies. The sale of town allotments by auctioneer, John Cairns of Herberton on 5 November 1900, realised £7,500.⁶⁶ Moffat did not gamble there that day. Speculators and merchants also predominated at the Calcifer and Mungana sales later that year, but Moffat did not attend. Moffat never ventured into the burgeoning region, not even after the railway opened to Chillagoe at which time smelter construction was in full swing, creating the hub of a vast inland enterprise.

James Reid's enterprise looked like a takeover of the north in contrast to Moffat's practices. The Broken Hill directors controlled the whole copperfield north of the Palmerville Fault, running from Muldiva to Dargalong, then to the west of Chillagoe and north to the Palmer River and Princess Charlotte Bay. They also determined the direction of the Mount Garnet development to the south east of Chillagoe.

In this expansionary climate, Moffat also promoted his Mungana mines to the Broken Hill directors and the Mungana (Chillagoe) Mining Company Limited was formed with a capital of £125,000 in five shilling shares in 1901. Reid, Moffat, Chapman, Knox and Patterson, initial directors, acquired the Mungana leases from the Chillagoe Company for £60,000 and 100,000 fully paid shares.⁶⁷ By also excising the successful Girofla, Griffith and Lady Jane mines, they took the Chillagoe Railway and Mines Company Limited's richest security and the indemnity against complaints by the debenture-holders. It was a highly expensive exercise, designed to finance building the smelters, and the directors quickly off loaded their shares.

Public concern

By late 1901 the two extremes of the Chillagoe project were causing public concern, as the mines did not measure up to the predicted reserves and the high development costs became a burden. The share price fell dramatically. Over half-a-million pounds had been spent - the railway cost £380,000, smelters £75,000, and mining development

£140,000. The smelters erected under Shepherd's supervision comprised six furnaces for separate lead and copper treatment. On completion of the smelters, Stewart resigned as general manager for health reasons. Reid thereupon appointed Ernest Weinberg who had trained in Leipzig as general-manager and metallurgist he having had previous experience at Anaconda in America and at Aldershot and Dapto in Australia. His first task was to report on ore-reserves in response to rumours about discouraging exploration results.⁶⁸ Frederick Back, former Commissioner for Railways in Tasmania, was appointed managing director in a determined effort by Reid to appoint first-class staff to retrieve a flagging venture.⁶⁹

Weinberg's report in June 1901 both surprised and humiliated Reid but Moffat was accustomed to adjusting to lower ore reserve estimates in the North. Moffat had never sold anything beyond a prospect and only bought proven mines. Stewart had estimated 440,000 tons of ore exclusive of Mungana with an estimated copper content of 15,640 tons, 530,000 ounces of silver and 7,000 tons of lead. Weinberg, however, estimated only 175,983 tons of ore with only 5,122 tons of copper, 194,461 ounces of silver and 476 tons of lead. The smelters still had not yet been blown in! The directors were amazed and bewildered.⁷⁰ Secretly they studied the report then hurried to Chillagoe to inspect mining development. Moffat did not go. Whispers of trouble began circulating, causing share prices to spiral down. The directors were stunned into silence. The *Australian Mining Standard* thundered in August 1901 that:

if the discrepancy [in estimated reserves] is not such as to justify panic they [the shareholders] should know it. If half or all of their reserves have mysteriously vanished it is right they should be so informed.⁷¹

Reid, still supporting Stewart's estimate, sent a circular to shareholders to allay fears and sought a third opinion, that of Danvers Powers, a mining consultant. Shares slid further, pending Powers' report. Reid sold a thousand shares but Moffat, Chapman, Knox and Patterson held firm while facing dissenters' criticisms at the September shareholders' meeting. Powers' report in November 1901 was even more damning than Weinberg's. He estimated that, excepting Mungana, only 94,792 tons of ore were available, likely to yield 3,304 tons of copper, 135,960 ounces of silver and 360 tons of lead. Powers preferred to analyse the field in terms of various prospects, just as Moffat did when he sold them. He was alarmed by the scarcity of ore in sight, reporting that:

the mines are not sufficiently developed to maintain an output that will keep your nest of furnaces in blast for the time being, the reason being that a large portion of the work done has been off instead of on the ore bodies.

He was particularly critical of the directors on this matter:

A great mistake was made in proceeding with what was intended to be permanent work before the nature of the deposits was properly understood ... very little ore [is] in sight now, than when the property was acquired ... [a] great deal of money [has been] spent to no purpose.⁷²

Protecting a reputation

The smelter opened in September 1901, closed in November 1901. It had treated 8,129 tons of ore for 367 tons of copper before shareholders met to receive Powers' report.⁷³ More money had been spent on infrastructure than the total value of ore-estimates that included Mungana.⁷⁴ An extraordinary meeting of shareholders was held in Melbourne in December and Moffat made his fourth visit to Melbourne to attend. Directors were determined to survive the onslaught of shareholders' invective in order to escape from reality through attempts to raise more capital from shareholders. Because he was the only director who held more shares in November 1901 than when the company was formed, Moffat retained his credibility. Regarding capital raisings, he informed the meeting that he was only willing to cover his indebtedness if preference shares were issued in a reconstructed company.

The genuine shareholder had been humiliated by the directors' share selling and the sliding price.⁷⁵ Except for criticism that he had not exercised an active directorship, Moffat escaped their wrath. Reid sought to subdue the onslaught by convincing Moffat to speak at the meeting. While admitting that every director had a right to sell his shares, Moffat said he had not done so. This is the basis for the subsequent legend that he was the only director not to profit out of the Chillagoe boom.⁷⁶ Clearly Moffat was protecting his own reputation at that meeting after having promoted a barren field. Holding 25,400 shares proved his honesty and provided a cover for the profits reaped from the Chillagoe Proprietary Company and Mungana (Chillagoe) Mining Company share sales, which launched him on a multitude of development proposals in the North.

Moffat felt that the BHP directors in the whole Chillagoe debacle had used him for his high reputation. His dream of smelters situated on the Tablelands had induced him to become involved with the company. He held the Chillagoe project as a means of

attracting venture capital to all of his northern prospects, ‘though his preference lay in supervising tin-production at Irvinebank, Koorboora and Stannary Hills, developing wolfram mines at Wolfram Camp and Mount Carbine, promoting more copper ventures at Mount Garnet and Mount Molloy. However, the Chillagoe development never repaid shareholders for their investments. They were opened towards the end of 1902 by the New Chillagoe Railway and Mines Limited. The company treated ore successfully but had to raise further funds in 1905 in another reconstruction of the company. In 1911 there were difficulties with coke and ore supplies following the collapse of the No.11 tunnel on the Cairns Range railway and other damage to mines and railway bridges during heavy rain. A serious fire in the smelter at the end of 1911 and further serious delays in 1912-1913 forced the smelters' closure in 1914.

To maintain the local economy and retain population and employment in the region the Queensland Labor Government purchased the smelters from Chillagoe Limited along with the Chillagoe and Etheridge Railways under the *Chillagoe and Etheridge Railways Act 1918* and re-commenced as a state enterprise in January 1920. A 1921 amendment allowed Government to purchase and operate mines, but metal prices declined and operations proved unprofitable. All furnaces were closed on 12 February 1927 due to a strike at Mount Mulligan Colliery and heavy rains.

The smelters were re-opened on 15 October 1929 by the State Government and operated continuously treating ores from all around north Queensland until closure in 1943, most ores being directed to Mount Isa's copper smelter at the Commonwealth Government's request. Up to their closure in 1943, the smelters treated 1.27 million tonnes of ore for a yield of 5.45 million grams of gold, 202.15 million grams of silver, 60,960 tonnes of copper, 50,800 tonnes of lead, valued at A£7 million [AUD\$14 million at 1966 conversion rate on changeover to decimalisation].⁷⁷

Endnotes

¹See Ruth S. Kerr, *John Moffat of Irvinebank: a biography of a regional entrepreneur*, J.D. & R.S. Kerr, St Lucia, 2000, for a full biographical assessment of Moffat's career.

²Geoffrey Blainey, *The Steel Master: Essington Lewis*, Macmillan, Melbourne, 1971, p. 71.

³Ruth S. Kerr, ‘Calcifer - the first copper smelter on the Chillagoe copperfield’, *The Australian Journal of Historical Archaeology*, vol.13, 1995, pp. 18-23, and ‘Queensland Copper’, 1901: Aedeen Cremin (ed.), *Australian Life at Federation: an Illustrated Chronicle*, UNSW Press, Sydney 2001, pp. 42-43.

⁴Geoffrey Blainey, *The Rush That Never Ended: a History of Australian Mining*, Melbourne UP, Melbourne, 1963, reprint 1981, Ch. 22.

⁵See John D. Kerr, *Mount Morgan: Gold, Copper and Oil*, J.D. & R.S. Kerr, St Lucia, 1982, Chs 12 and 13, and Blainey, *The Rush That Never Ended*, pp. 242-243.

⁶*Ibid.*, pp. 216-217.

⁷*Ibid.*, pp.217-221; For a full history of Mount Lyell see Geoffrey Blainey, *The Peaks of Lyell*, Melbourne UP, Melbourne, 1954.

⁸R.L. Jack, 'Report on the Chillagoe and Koorboora Mining District', *Geological Survey Queensland Publication no. 69* [hereafter *GSQ*], Queensland Government Printer, 1891. The reports of Denny and Miller in 1891 on the Redcap Group of silver lodes enthused Melbourne investors but without any permanent commitment. See Queensland. Department of Mines. *Annual Report* [hereafter *QMR*] 1896, p. 106; S.B.J. Skertchley, 'The Tin Mines of Watsonville and various tin, silver, gold and copper mines at Herberton, Mount Albion, Irvinebank, Muldiva, Calcifer, Chillagoe, California Creek, the Tate River, Mareeba', *GSQ* publication no. 119, 1896; R.L. Jack, 'Report on the Chillagoe District and Projected Railway', *GSQ* publication no. 134, 1898.

⁹MWO 12B/56, Queensland State Archives [hereafter QSA], and *QMR* 1897, p. 105.

¹⁰Moffat's evidence in February 1901 in the case, *McEacharn V Chapman*, in Supreme Court, Melbourne, over negotiations concerning the formation Chillagoe and Mount Garnet companies. See Moffat's Mount Garnet correspondence [hereafter MMGC] collected by the late A.F. Waddell and now in the possession of the Australian Narrow Gauge Railway Museum Society, Brisbane, Queensland.

¹¹Charles William Chapman was trained at Bendigo School of Mines. In the late 1880s he established Chapman Wakley Mining Promoters to operate the Dry River Metallurgical Works in South Australia. He also had pastoral interests, a share in the Cascade Brewery and a directorship in the Union Mortgage and Agency Company.

¹²For Reid's career, see K.H. Kennedy, 'Sons of the Manse: The Reid Brothers in Early North Queensland', *Lectures On North Queensland History no.4*, James Cook University of North Queensland History Department, Townsville, 1984, pp. 1-35, and 'J.S. Reid and the Chillagoe Company', in K.H. Kennedy (ed.), *Readings In North Queensland Mining History* vol. 2, JCU, Townsville, 1982, pp. 217-274; Blainey, *The Rush That Never Ended*, pp. 225-226.

¹³For details of the extent of the Mount Lyell copper boom see Blainey, *The Peaks Of Lyell*, and A.R. Hall, *The Stock Exchange Of Melbourne and the Victorian Economy 1852-1900*, ANU Press, Canberra, 1968, pp. 225-9.

¹⁴Moffat's evidence in February 1901 in the case, *McEacharn V Chapman*, MMGC.

¹⁵The agreement was enclosed in the Company Files of the Chillagoe Proprietary Company deposited in both the Victorian and Queensland Companies Offices - no. 3.244 and in Co. 29, book 9, A/21.698, QSA, respectively.

¹⁶For a full analysis see the 'Royal Commission on the Queensland National Bank Report and Evidence', and T. Gough, 'Tom McIlwraith, Ted Drury, Hugh Nelson and the Queensland National Bank 1896-1897', *Queensland Heritage* 3, November 1978, pp. 3-13.

¹⁷Isidor Lissner, Member for Charters Towers and a former Secretary for Mines, was one of the leading proponents of the Bill. Robert Philp was Secretary for Mines, and life-long friend and supporter of Moffat and an avid mining speculator and co-member with Reid in a syndicate to float the Mitchell River Antimony Mines of North Queensland in 1892. John Newell, well-known Northern storekeeper and Member for Woothakata, was a mining associate of Moffat through the Great Northern Tin Company and a prospective shareholder of the proposed Chillagoe Company. Andrew J. Thynne, Member of the Legislative Council, and a member of Thynne and Macartney, Solicitors, readily became legal adviser to the company.

¹⁸G.C. Bolton, 'Robert Philp', in D.J. Murphy and R.B. Joyce (eds), *Queensland Political Portraits*, St Lucia, UQP, 1978, p. 205.

¹⁹*Australian Mining Standard*, 9 December 1897, p. 2494.

²⁰*Ibid.*, 10 February 1898, p. 2669.

²¹John (Plumper) Hoolan, outspoken member for Burke, supported the Bill against the will of the Labor Party. Anderson Dawson (1863-1910), miner and journalist, member for Charters Towers 1893-1901, Premier and Chief Secretary 1-7 December 1899.

²²*Queensland Parliamentary Debates* [hereafter *QPD*], 1897 vol. LXXVIII, p. 1872.

²³*Ibid.*, p.1831-2.

²⁴Company File 129, book 9, A/21,716, QSA.

²⁵Telegram from the Mayor of Cairns to Minister for Lands, 12 February 1898, quoted in *Queensland Parliament, Votes & Proceedings*, [hereafter *QV&P*] 1899, vol. 3, p. 84.

²⁶*AMS*, 7 July 1898, pp. 3,033-35.

²⁷*Wild River Times*, 25 January 1898.

²⁸*Sydney Bulletin*, 16 July 1898, p. 9.

²⁹*Ibid.*

³⁰Charcoal was £3.18s.6d per ton. See *AMS*, 12 May 1898, p. 2,917.

³¹*Queenslander* [Newspaper], 20 August 1898, p. 340; Sketchley, ‘The Tin Mines of Watsonville’.

³²*AMS* 16 June 1898, p. 3,010 and *Queenslander*, 16 July 1898, p. 111, c.3.

³³Chillagoe United, Victorian Public record Office [hereafter VPRO] Series 932, 6,249; North Queensland & Chillagoe Prospecting Syndicate, VPRO, 6,298; Chillagoe-Bedford and Mt. Garnet Ltd, Company 249, book 9, A/21,737, QSA; Melbourne Chillagoe Prospecting Association, VPRO, 6268; Central Chillagoe Prospecting Association, VPRO, 6262; Chillagoe Minerals Prospecting Association NL, VPRO, 6259; Chillagoe Investment and Mining Co. NL, VPRO, 6258; Mount Garnet and Chillagoe Exploration Co. NL, Company 28, book 10, A/21,746, QSA; Lamb's Chillagoe Prospecting Association NL, VPRO, 6256; Chillagoe Mines Company NL, VPRO, 6,260, are a sample listing from the Queensland and Victorian Company registers.

³⁴*AMS* 26 May 1898 p. 2,952.

³⁵Stewart writing in the Chillagoe Proprietary Company Report to 26 June 1898, pp. 5 and 20, Mitchell Library; *AMS* 14 July 1898, p. 3,079.

³⁶*Maryborough Chronicle*, 1 June 1898, p. 2, c. 7.

³⁷*Sydney Bulletin* 14 May 1898, p. 9; Company file 29, book 6, A/21698 QSA. Shareholders list, 28 June 1898. The Irvinebank Mining Company and Moffat had 160 shares at 28 January 1898, of which Moffat personally held 145 shares. Therefore the Irvinebank Mining Company was originally issued with 15 shares. The Irvinebank Mining Company sold 24 and still had 111. Therefore it bought 111 + 24 - 15 = 120 shares from Moffat. Moffat sold 135 shares in total so 135 - 120 = 15 shares were sold to the public (that is, not the Irvinebank Mining Company). Therefore a total of 15 (Moffat) and 24 (Irvinebank Mining Company) of the 160 shares were sold to the public, thus they sold slightly less than 25 per cent of their holdings to the public.

³⁸Skertchley even conducted the Church Service in Chillagoe in June 1898. *Wild River Times*, 21 and 26 June 1898.

³⁹The bank had accommodated its best customer through periods of tick plague, transport delays and machinery purchases, trusting Moffat's assessment that Chillagoe would be floated successfully. See half-yearly reports of the Herberton Branch of the Queensland National Bank 1895 – 1899, National Australia Bank Archives; MWO 12B/56, QSA.

⁴⁰See distribution entitlement on 22 October 1898 of £580,000 Chillagoe Railway and Mines Limited shares issued to Chillagoe Proprietary Company shareholders as part of the consideration for the sale of Chillagoe Proprietary Co. on 1 July 1898 - filed with Chillagoe Railway and Mines Limited papers, no. 3,244, VPRO.

Table: *Distribution of 580,000 shares in Chillagoe Railway and Mines Limited as part of Consideration of Sale of Chillagoe Proprietary Company*

Shareholders	Percentage of C.P. & Co.	Percentage of C.R.M. Ltd
Moffat	1.72	1.11
Irvinebank Mining Company	20.52	13.21
Reid *	10.72	6.91
Chapman	6.89	4.44
Knox *	8.33	5.37
Southern directors (see * above)	25.95	16.71
All directors and IMC	48.18	31.03
Southern Mining speculators (excluding directors)	17.12	11.03
Total all directors, IMC & Southern Mining speculators	65.31	42.06
Southern speculators & Southern directors	43.07	27.74

The percentage of Chillagoe Railway and Mines Ltd column is based on the assumption that these shareholders did not make any purchases of Chillagoe Railway and Mines Ltd shares at the outset of the company. This is a fair assumption because, as speculators, they progressively sold their shares on another rising market as subsequent events showed.

⁴¹*Australian Mining Standard*, 14 December 1899, p. 453.

⁴²For details see correspondence on the Lease of the Barron Falls to Chillagoe Railway and Mines Limited, *QV&P* 1899, 2nd Session, vol. 3, 83f.

⁴³*Australian Mining Standard*, 4 January 1900, p. 4.

⁴⁴*Ibid.*, 14 July 1898.

⁴⁵Reid to Philp, 9 June 1899, 3/1371, Philp Papers, OM65-32, John Oxley Library [hereafter JOLib].

⁴⁶J.S. Reid to M. Reid 3 August 1899, J.S. Reid Papers, quoted in Kennedy, 'J.S. Reid and the Chillagoe Company', p.228; *Australian Mining Standard*, 5 January 1899, pp. 40-41.

⁴⁷*Mining Journal* [London - hereafter *MJ*], 8 April 1899, p. 393.

⁴⁸*Ibid.*, 8 April 1899, p.,393 and 29 July 1899, p. 904.

⁴⁹Directors were S. Stephen, formerly of Stephen, Jacques and Stephen, Solicitors, Sydney; Mr Ronald, a director of Australian Mortgage Company, and Douglas Reid, brother of J.S. Reid. See *Australian Mining Standard*, 9 March 1899.

⁵⁰Reid to R. Philp 9 June 1899 - Philp Papers, 3/1371-3, OM65-32, JOLib.

⁵¹There was a contemporary suggestion that Moffat received Chillagoe shares as dividends from North Queensland companies in which he had substantial interests. The Vulcan was the only North Queensland company paying dividends, and it could afford to pay in cash. See *Queensland Mines and Works Gazette*, 14 November 1901, p. 93, ex *Melbourne Age*.

⁵²*Australian Mining Standard*, 5 December 1901, p. 868.

⁵³*Ibid.*

⁵⁴*Ibid.*, 5 December 1901, p. 868.

⁵⁵For an analysis of the financial and corporate arrangements used for the construction of all North Queensland's Private Railways, see J.D. Kerr, 'North Queensland Mining Railways', in *Readings in North Queensland Mining History*, vol. 1, pp. 273-298.

⁵⁶*Queensland Governement Mining Journal* [hereafter *QGMJ*] July 1900 p.51 and *MJ* 15 December 1899 p.1526.

⁵⁷'Annual Report of the Chillagoe Railway and Mines Limited to 31 December 1899', VPRO Defunct Trading Company file 3244.

⁵⁸See A/9222-A/9229, QSA, for construction and details of early operations on Chillagoe Railway.

⁵⁹Seething arguments occurred between Frew and Henry Charles Stanley, veteran Chief Engineer, and a stickler for adherence to Queensland Railway standards.

⁶⁰He later worked on the Mount Garnet Railway, Cairns - Mulgrave Tramway and the Etheridge Railway.

⁶¹*Cairns Post*, 2 October 1900. A special train left Cairns on 30 September 1900 conveying Walter Stevens Prewett, District Traffic Manager, George Alexander Hobler, District Engineer, Frew, and local railway officials, to inspect the line as far as the 67 mile [108km], which lay 12 miles [19.3km] beyond Lappa, and to instruct stationmasters in administering the special traffic agreement.

⁶²*QMR*, 1901, p.74; *Queenslander*, 20 August 1898, p. 340 and the *Brisbane Courier*, 27 August 1904, p. 4.

⁶³Queensland Railways Hard Batches series, Chillagoe Railway, A/9222, QSA.

⁶⁴*Ibid.*; *Queenslander*, 23 July 1898, p. 147, c. 3 and 24 June 1899, p. 1,186, c. 2.

⁶⁵Mines Reports 1898-1901. Frew's Report to 31 October 1900 in *QGMJ*, March 1901. *Croydon Mining News*, 22 February 1900. Chillagoe Railway and Mines Company Limited Reports filed in VPRO Defunct Trading company file 3,244.

⁶⁶*Cairns Post*, 2 and 9 November 1900.

⁶⁷Company file 172, book 10, A/21,777 & A/21,778, QSA.

⁶⁸Ernest Weinberg was born in 1855, and trained at the University of Leipsig, Polytechnic, Hanover, and Mining Academy, Clausthal. He left Germany in 1880 to join the mining firm of J.J. Haggin and Company, San Francisco, and later Anaconda Company. He emigrated to Queensland in 1889 to manage the Aldershot smelters near Maryborough. He went to Dapto in 1898 to manage the Smelting Company of Australia works. He had married Nellie B. Kreling, a San Franciscan, and had two children. See *QGMJ*, May 1901, p. 192, quoting *Australian Mining Standard*.

⁶⁹Chillagoe Railway and Mines Company Limited, Sixth half-yearly Report, VPRO Defunct Trading Company file 3,244.

⁷⁰*Ibid.*

⁷¹*Australian Mining Standard*, 22 August 1901, p. 240.

⁷²*Queensland Mines and Works Gazette*, vol. 2, no. 5, 14 November 1901, p. 93, quoting *Brisbane Courier*.

⁷³*QMR* 1901, p. 14.

⁷⁴*Australian Mining Standard*, 21 November 1901 and *QGMJ*, December 1901, p. 578.

⁷⁵*Australian Mining Standard*, 12 September 1901, pp. 363-4 and 12 December 1901, p. 905.

⁷⁶See Blainey, *The Rush That Never Ended*, p. 132 and Bolton, 'Robert Philp', pp. 284-5, and O.H. Woodward *Autobiography* (unpublished, held in Mitchell Library, Sydney) for the theme of Moffat's honesty.

⁷⁷Ruth S. Kerr, 'Chillagoe Smelters - focus of politics and mining in north Queensland, 1887 – 1943', in J.E. Fell, P.D. Nicolaou, G.D. Xydous (eds), 5th International Mining History Congress, *Book of Proceedings*, 12-15 September 2000, Milos Island, Milos Conference Center Greece, 2001, pp. 200-208.