

JOSEPH CAMPBELL AND HIS THERMO-HYPERPHORIC
PROCESS

Philip Hart

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Historical Research Unit
Faculty of Arts & Social Sciences
The University of Waikato
Private Bag 3105
Hamilton, New Zealand

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Contact: prhart1940@gmail.com



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Abstract: *Joseph Campbell was both an Anglican clergyman and a scientist, with a preference for the latter. Actively involved in educating the masses in scientific matters, and particularly those, like miners, with particular problems to overcome, he was a rather shameless self-publicist, insisting that he could solve most things. Sometimes he was correct, and his practical advice was valued, especially in the last phase of his life.*

After Alfred Andrew Lockwood developed a method of treating refractory Te Aroha ore, Campbell modified it, naming it the thermo-hyperphoric process. After inspecting Hauraki mines in 1896, he later settled at Te Aroha to test his process on a large scale. Great success was promised, with claims being made that he could save most of the assay value of the ore in a process superior to any other. Other miners along with geologists were critical of his claims and of his understanding of the geology, but he ignored them. The Montezuma Company was formed in London to fund the development of mines mostly between Tui and Te Aroha, and to erect his plant. Despite his promises, his plant failed, to great local disappointment.

In addition to trialing ore treatment, Campbell also experimented in other areas. After leaving Te Aroha and focusing for a time on being a clergyman, he settled in North Queensland, remaining there until his death trying to solve a variety of problems facing primary producers, sometimes with success. To the end of his life he claimed to be an expert in a myriad of fields, and ignored all his critics.

FAMILY BACKGROUND AND EARLY LIFE

Joseph Campbell was born on 13 September 1856 in the farming community of South Creek, St Mary's, near Sydney, New South Wales, to William Branch Campbell, a merchant, and Elizabeth Ann Jackson.¹ In 1909 Campbell described his father as having been of 'independent means'.² According to an 1897 biographical article based on his information, his father was 'of good Scotch, and the latter of good English, family descent,

¹ Kenneth Cable (Department of History, Sydney University), to Philip Hart, 8 April 1988.

² Marriage Certificate of Joseph Campbell, 9 October 1909, 9954/1909, New South Wales BDM.

who came out to Australia in the late forties, and entered into pastoral and subsequently commercial pursuits'.³ In an 'autobiographical sketch' self-published in 1922, when as 'Demonstrator Campbell' and director of his North Queensland Intelligence Bureau he was seeking employment, he expanded on these bare facts, in typical style:

Well, to begin with, he is an Australian, born of English parents, in New South Wales, near Sydney. On his father's side – the late W.B. Campbell – he is descended from a noble Scottish family, a Highland Laird, owner of Donoon Castle, who joined forces with Lord Lovat and espoused the cause of Prince Charlie, defeated at Culloden, 1745. Lord Lovat was beheaded in the Tower of London – the last executed on the block which now is exhibited in the Tower. The young Highland Chieftain, Campbell, escaped with his life to Rosshire, and all his estates were confiscated. Thousands have been expended trying to recover possession – especially in 1839 – but without success. On his mother's side Demonstrator Campbell comes of a long line of intellectual men, who combined science with practice, his mother being the daughter of a physician, Dr Jackson, of Euston Square, London, who died at an early age.

Demonstrator Campbell spent his early years at the beautiful old home, "Clarence Villa," on the heights overlooking the Lane Cove River, emptying itself into Sydney Harbour. Here he learnt to swim, boat, and handle the sportsman's gun. Then he lived on his father's fertile estate, known as "Fountain Dale," Kiama, where he became a proficient horseman; and, under the guidance of his private tutor, studied the principles of agriculture on the farm, and engineering in the fitting-room of a mill on the estate. Then he was put into a commercial house to learn book-keeping and commercial methods, before entering on his more arduous academical career, at the same time availing himself of opportunities of studying vine and sugar culture. During a temporary reverse that his father sustained in his extensive commercial enterprises, he had the satisfaction of earning his own living by first acting as junior master in a Grammar School, receiving board and training, which enabled him to pass the Senior University Examination, with a £10 prize attached, and subsequently, at Flushcombe, near Sydney, by conducting a class for boys of leading citizens, teaching all day, with sundry stray hours for literary work and horse exercise, and studying nearly all night. While in his teens he wrote and published "The Geography of Australia, New Zealand and Tasmania," which cost nearly £100. This money was the result of accrued interest on a small sum of money placed in his name at the Savings Bank at

³ *Australian Mining Standard*, 15 July 1897, p. 2031.

birth, and he recommends every parent to do the same for his child, if only the maternity bonus – a State benefit unknown in his early days, but which he has taken advantage of for his own children, in order that should they require £50 or £100 in their teens, it may be available from this sources, as we – none of us – know what need the vicissitudes of fortune may cause. This is just a word of practical advice to parents. The sale of the edition was satisfactory, and the proceeds were devoted to the publication of other small works, viz, “Norfolk Island and Its Inhabitants,” which charming spot he had visited in order to study the workings of the Melanesian Mission, for which he had some idea of offering his services, and subsequently “The Amateur Photographer’s Primer.” During his residence on his father’s estate at Flushcombe, a splendid orangery of 100 acres was laid out, and he had every opportunity of studying citrus fruits from the clearing of the land through the stages of growth to bearing. Fortune had again smiled on his family, and he entered St Paul’s College, within the University of Sydney, winning the Fellow’s Divinity Scholarship, which he expended on books, as his noble father paid all his College and University expenses, besides making him a liberal personal allowance.

This is all narrated to show that Demonstrator Campbell knows something of the ups and downs of life and the ways of commerce, beside the many things pertaining to the practical scientific work in which he has been so long engaged, and for which he had a very special preparation.⁴

LEARNING AND TEACHING SCIENCE

Campbell was educated both by tutors at home and at private schools. For several years before matriculating in 1877 he was a schoolteacher on a family property near Prospect, west of Sydney.⁵ According to the 1897 article, ‘after extensive travel in the colonies’ he published ‘the first complete geography of Australia, Tasmania, and New Zealand’,⁶ *Physical and Political Geography*, its 80 pages being a compendium of facts rather

⁴ Joseph Campbell, *Autobiographical Sketch of the Demonstrator, for the Perusal of those who wish to make use of his Services as Director of the North Queensland Intelligence Bureau* (Cairns, 1922), no pagination [pp. 1-3].

⁵ David Branagan, ‘Then Look Not Coldly on Science: Joseph Campbell, M.A., Journeyman Cleric’, *Journal and Proceedings of the Royal Society of New South Wales*, vol. 131 Parts 1-2 (June 1998), p. 19.

⁶ *Australian Mining Standard*, 15 July 1897, p. 2031.

than based on personal experiences; popular with schools, a second edition was produced in its year of publication, 1876.⁷

In his teaching and lecturing Campbell used photographs, by the early 1880s being a competent photographer, 'carrying out all steps from photo to print. In 1884 he prepared and published a 26-page pamphlet, *The Amateur Photographer's Primer*'.⁸ His 1895 pamphlet *Gold & How to Get It*, based on a lecture given in Sydney, contained three of his photographs.⁹ His had illustrated his lecture with 'graphic limelight views' and a 'large number of excellent photographs'.¹⁰

When residing in St Paul's College at the University of Sydney from 1877 to 1880, his interest in science may have been encouraged by the two wardens, one a former government astronomer and the other a chemist.¹¹ He joined the Royal Society of New South Wales in 1879.¹² In 1922 he described his university career:

I took my B.A. degree in Sydney University in 1880, specialising in Experimental Physics and Analytical Chemistry. I took as my honour subject Agricultural Chemistry in relation to Geology, and gained the Belmore Gold Medal, which is only open to graduates, and is the highest distinction the University could confer in Agricultural Chemistry. The contest was sharp, and I know it was owing to my practical knowledge, shown in the viva voce examination, which altogether occupied three days, that I was the winner. This practical knowledge was acquired by residing for short periods on farms, vineyards, canefields on the Clarence River, and orchards further south, before entering St Paul's College, within the University, of which I was subsequently elected a Fellow. It was on the Clarence I first studied sugar manufacture, in the old-fashioned open-pan mills.¹³

⁷ Branagan, pp. 22, 35.

⁸ Branagan, pp. 22, 35.

⁹ Joseph Campbell, *Gold, and How to Get It, or One Solution of the Unemployed Problem, Being a Popular Geological Lecture delivered in the Great Hall of the School of Arts, Sydney, New South Wales, on Monday Eve, December 3rd, 1894*, 2 ed. (Sydney, 1895), cover, pp. 15, 17.

¹⁰ Branagan, pp. 22-23.

¹¹ Branagan, p. 21.

¹² Branagan, p. 23.

¹³ Campbell, *Autobiographical Sketch*, [p. 5].

He had graduated from the Schools of Mathematics and Natural Science with a Bachelor of Arts, the only degree then granted, which comprised one-third science subjects. The Belmore Gold Medal was awarded 'for proficiency in Geology and Practical Chemistry, with special reference to Agriculture'.¹⁴ Campbell held a part-time scholarship in 1882, working in the School of Natural Science and being awarded a Master of Arts after examinations in chemistry and applied physics; his special subject was geology.¹⁵ In 1902 he was awarded a Master of Arts *ad eundem gradum* by the University of New Zealand, and thereafter described himself as Master of Arts of 'Syd. and N.Z'.¹⁶

According to the 1897 article, 'as the result of these successes he was offered a position on the staff of the Ballarat School of Mines'; in 1922 he claimed to have been offered the principal's job.¹⁷ He declined the offer of work,

as he wished to devote some time to the study of theology, which he has always regarded as the highest branch of science, requiring an extensive knowledge of other branches to unfold its mysteries. He took Holy Orders in December, 1880, but with the firm intention of devoting much of his time to scientific work, after the example of the late Revs. W.B. Clark and J. Tennyson Woods, of New South Wales.¹⁸

William Branwhite Clarke, an Anglican clergyman, was a pioneer geologist who claimed to have been 'the scientific discoverer of Australian gold', in 1841.¹⁹ The latter, correctly Julian Edmund Tenison-Woods, a

¹⁴ Kenneth Cable to Philip Hart, 8 April 1888; *Australian Mining Standard*, 15 July 1897, p. 2031; Campbell, *Gold, and How to Get It*, p. 28.

¹⁵ Kenneth Cable to Philip Hart, 8 April 1888; *Australian Mining Standard*, 15 July 1897, p. 2031; Campbell, *Autobiographical Sketch*, [p. 6]; Joseph Campbell, *Campbell's Key of Knowledge of Science and Industry* (Sydney, 1923), pp. 3, 7.

¹⁶ Campbell, *Autobiographical Sketch*, [p. 8]; Campbell, *Campbell's Key*, p. 3; *Cyclopedia of New Zealand*, vol. 3, p. 195; Branagan, p. 21.

¹⁷ *Australian Mining Standard*, 15 July 1897, p. 2031; Campbell, *Autobiographical Sketch*, [p. 6].

¹⁸ *Australian Mining Standard*, 15 July 1897, p. 2031.

¹⁹ Ann Mozley, 'William Branwhite Clarke', *Australian Dictionary of Biography*, vol. 3, (Melbourne, 1969), pp. 420-422; Elena Grainger, *The Remarkable Reverend Clarke: The life and times of the father of Australian geology* (Melbourne, 1982).

Catholic priest, was another pioneering Australian geologist, especially in the 1860s and 1880s.²⁰

According to Campbell, he ‘was one of the first to popularise science in New South Wales by means of his Sydney science lectures for the people on Physics, Chemistry, and Geology’, leading to his selection, on the recommendation of Professor Smith, Professor of Experimental Physics, as his *locum tenens* from 1881 to 1883.²¹ Campbell lectured on electricity, magnetism, and heat.²² According to a testimonial from the university’s chancellor, he was ‘highly esteemed’ by the Hovell Lecturer in Geology.²³ ‘He then devoted a considerable portion of his time to geological research and lecturing on mining for the Board of Technical Education’, lecturing in chemistry, mineralogy, and geology, and ‘concurrently occupied the position of University Lecturer in Chemistry’, a position he claimed in 1922 was ‘still open to me when I wish to resume’.²⁴ As his teaching revealed the need for ‘some practical but simple book’ on geology, in 1884 he published *Simple Tests for Minerals, or, Every Man his own Analyst*.²⁵ ‘One of the most successful geological books ever published in Australia’, the fourth edition of 1898 was reprinted five times, the last time in 1936.²⁶ By 1923 it had sold 12,000 copies.²⁷ He claimed it had ‘been instrumental in opening up mines of great value in Australia and South Africa’; none were specified,²⁸ typical of his large but imprecise claims. The first edition of *Gold & How to Get it; or, one solution of the unemployment problem*, published in 1894, supplemented the geological information provided in the larger *Simple Tests*.²⁹ It is examined in detail below.

²⁰ B.H. Borchardt, ‘Julian Edmund Tenison-Woods’, *Australian Dictionary of Biography*, vol. 6 (Melbourne, 1976), pp. 254-255; Isabel Hepburn, *No Ordinary Man: Life and letters of Julian E. Tenison Woods* (Wanganui, 1979).

²¹ *Australian Mining Standard*, 15 July 1897, p. 2031; *Cyclopedia of New Zealand*, vol. 3 (Christchurch, 1903), p. 194.

²² Campbell, *Autobiographical Sketch*, [p. 6].

²³ Testimonial by Dr MacLauren, printed in Campbell, *Autobiographical Sketch*, [p. 13].

²⁴ *Australian Mining Standard*, 15 July 1897, p. 2031; Campbell, *Autobiographical Sketch*, [p. 6].

²⁵ *Australian Mining Standard*, 15 July 1897, p. 2031.

²⁶ *Australian Mining Standard*, 15 July 1897, p. 2031; Branagan, p. 24.

²⁷ Campbell, *Campbell’s Key*, p. 3.

²⁸ Campbell, *Campbell’s Key*, p. 3.

²⁹ Branagan, p. 25.

In the fourth edition of *Simple Tests*, the publishers inserted a ‘Note to the Reviewer’ stating that the book had ‘long enjoyed a steady sale, not only in Australasia, but also in America, the Cape, and many other parts of the world’. Not only had it been ‘carefully revised’ with some new illustrations and a new index but the corners had been rounded so it could be ‘more conveniently carried in the pocket’.³⁰ It contained ‘several important additions’, including how to treat refractory ores’.³¹ The preface, ‘For the Cause that Lacks Assistance’, explained that as it was designed for those lacking a systematic education in mineralogy, it was mostly free of technical expressions. More minerals had been included, enabling prospectors to test anything with a commercial value.

Feeling the importance of applying science to the development of our vast mineral resources, I have undertaken to devote for a few years the greater part of my time to assisting the development of mining, the treatment of refractory ores, and the investigation of the geological formations which are of economic importance.

Feeling that, as regards the material prosperity of these colonies, this is “the cause that lacks assistance,” I am constrained to labour for it.

In doing so I shall be brought into still closer contact with those for whom this book is written. I shall be glad at all times to place my services at the disposal of all who are engaged in legitimate mining operations.³²

The main text started with a declaration that the prosperity of Australia and New Zealand depended ‘to a very large extent on the development of our natural resources’, especially mineral deposits, the ‘present want of prosperity’ resulting from so little being done to develop these. ‘Truly there is work enough for idle hands, and this work will be available as soon as mining is delivered, as it must be ere long, from the degradation of a mere gamble, or at least a risky speculation, and is elevated to a sound commercial basis’. British capital would provide all the funds required.³³ The reader was told that his course was clear: ‘the mineral wealth exists – you must *search* first and make known its existence to the

³⁰ Angus and Robertson, ‘Note to the Reviewer’, inserted in Joseph Campbell, *Simple Tests for Minerals, or, Every Man his own Analyst*, 4 ed. (Sydney, 1898).

³¹ *New Zealand Herald*, 6 January 1898, p. 5.

³² Campbell, *Simple Tests*, p. iii.

³³ Campbell, *Simple Tests*, p. 1.

capitalist', thereby helping 'in no small measure to lay the foundation of the future greatness of these colonies'.³⁴

An advertisement for 'Campbell's Prospectors' Box' was included: 'Compact, Complete; Useful to Students; Invaluable to Prospectors, Miners, and Others', costing £2 10s and posted to any part of Australasia for an extra shilling.

The box, which is of polished deal, is 13 inches long by 6 inches wide, and 6 inches deep, and contains 33 different Chemicals and Articles, which are so ingeniously packed, each fitting in its own recess, that they can be carried any distance without fear of breaking. All the bottles have Ground Glass Stoppers, and those containing Acids have their names (Symbols) engraved on the glass.³⁵

When in New Zealand, Campbell claimed to have 'made a special study of the treatment of refractory ores', both in his own laboratory and on several Australian goldfields.³⁶ In 1905 he published *The Key of Knowledge for Miners, or, What's the Value of this Ore?: Being notes on practical chemistry and assaying*, a second addition of which was planned in 1923.³⁷ In his words, 'his slogan has always been "Science and Industry," for he feels that science is the basis of all human industries; and in his lectures and books he has always striven to put the Key of Knowledge in connection therewith into the hand of all who desire to use it'.³⁸ He regularly expounded his views on treating ore, for example his lecture, 'Gold: Its Occurrence and Extraction', delivered to the Melbourne Chamber of Commerce in mid-1897.³⁹

Within the boundaries of the Glen Innes parish of northern New South Wales, where he was based for a time, there was a 'great area of rich mineral-bearing country', including the chief tin producing part of the colony.

³⁴ Campbell, *Simple Tests*, p. 2.

³⁵ Campbell, *Simple Tests*, advertisement after p. 173.

³⁶ *Auckland Weekly News*, 25 July 1896, p. 29; *New Zealand Mines Record*, 16 July 1898, p. 524.

³⁷ Campbell, *Autobiographical Sketch*, [p. 7]; Campbell, *Campbell's Key*, p. 3; Branagan, p. 35.

³⁸ Campbell, *Campbell's Key*, p. 3.

³⁹ *Australian Mining Standard*, 15 July 1897, p. 2031.

While in this position he also held the post of science lecturer, or instructor, in geology and mineralogy to the Board of Technical Education. He also established and carried on at his own expense a School of Mines, which proved of great value to the mining community.

In 1886 he left for England, having been appointed a commissioner for the geological section of the Colonial and Indian Exhibition, and ‘devoted two years to geological pursuits’, according to his 1897 account.⁴⁰ According to his 1922 version, he studied for three years, and held a lectureship in an unstated institution, lecturing and preaching in ‘400 centres’. He was ‘elected a Fellow of the Chemical Society (F.C.S.), and Fellow of the Geological Society (F.G.S.), and in 1888 Member of the Royal Agricultural Society of England, and a Member of the Palaeontological Society’.⁴¹ He was also elected to the Linnean Society of London. He would be removed as a Fellow of the Geological Society in 1900, probably for non-payment of his subscription.⁴²

Having had offers of work in England, he felt strongly tempted to remain; but, feeling that he could be more useful in Australia, he returned in 1889 to take up his clerical and scientific work. He then devoted much time to geological lecturing and original research. *Inter alia*, he turned his attention to the treatment of refractory auriferous ores, and clearly demonstrated the application of water-gas to the elimination of the refractory elements,⁴³

according to his 1897 account, published after he had developed the water gas process. Once back in Sydney, he worked in his own laboratory, ‘investigating everything that was brought under my notice’, sometimes with the assistance of a university demonstrator in chemistry.⁴⁴ In 1890 he lectured in southern New South Wales on behalf of the Board of Technical Education on ‘The Chemistry of Goldfields’ and ‘The Earth’s Surface’.⁴⁵ In

⁴⁰ *Australian Mining Standard*, 15 July 1897, p. 2031.

⁴¹ Campbell, *Autobiographical Sketch*, [p. 7].

⁴² Branagan, p. 21.

⁴³ *Australian Mining Standard*, 15 July 1897, p. 2031.

⁴⁴ Campbell, *Autobiographical Sketch*, [p. 7].

⁴⁵ Branagan, p. 25.

1893 he was appointed University Extension Lecturer in Geology and Chemistry, ‘and devoted all the time he could to furthering the development of the mineral resources of the colonies’.⁴⁶ From 1895 to 1901 he was a Fellow of St Paul’s College, University of Sydney, which must have been a largely nominal post owing to his spending most of that time outside Australia.⁴⁷

From 1893 to 1897, Campbell was principal of St Nicolas’ College, Randwick, a secondary school for boys. Housed in the former residence of the Bishop of Sydney, he explained in 1898 that he had founded it after being ‘impressed with the necessity that existed for the proper training of mining experts’; one of its features was providing training for this profession, which he ‘always desired to assist and elevate to a more dignified position’.⁴⁸ An 1895 advertisement describing it as ‘A First-Class School for Day Boys and Boarders’ listed Campbell’s academic qualifications and lectureships and explained its object:

Our object is to furnish a “liberal education” at a ‘moderate cost. It is our aim to develop the nobler characteristics of boys placed under our care and to educate each according to the best of his ability, whether that bent be in the direction of a professional or commercial career.

While the subjects of the ordinary high school curriculum are most carefully taught, special attention is paid to scientific subjects.⁴⁹

Geology and mineralogy were prominent features, and photography, ‘highly advantageous in reporting on mining properties, if not absolutely essential’, was ‘practically taught’.⁵⁰ Because of the economic depression the school did not prosper.⁵¹ Whilst directing his college Campbell continued his

⁴⁶ *Auckland Weekly News*, 25 July 1896, p. 29; *Australian Mining Standard*, 15 July 1897, p. 2031.

⁴⁷ *Crockford’s Clerical Dictionary* (Oxford, 1906), p. 224; Branagan, p. 20.

⁴⁸ Kenneth Cable to Philip Hart, 8 April 1898; *Australian Mining Standard*, 15 July 1898, p. 2031.

⁴⁹ Advertisement, in Campbell, *Gold, and How to Get It*, p. 28.

⁵⁰ *Auckland Star*, 28 September 1896, p. 4; Branagan, p. 26.

⁵¹ Kenneth Cable to Philip Hart, 8 April 1898.

geological investigations, including reporting on one mining property for an 1894 prospectus.⁵²

A CHURCH OF ENGLAND CLERGYMAN

Although baptized a Presbyterian,⁵³ Campbell was appointed an Anglican lay reader in December 1876 and was Fellows Scholar in Divinity at the University of Sydney during 1877 and 1878, living in St Paul's College, an Anglican college.⁵⁴ His 30-page booklet of 1879, *Norfolk Island and its Inhabitants*, was based on personal experiences during three weeks spent there learning about the inhabitants in order to prepare himself for possible work for the Melanesian mission. 'He claimed that he checked with the elders and leaders everything he had been told and written'.⁵⁵ Appointed a curate at St Michael's, Surrey Hills, in December 1880, a parish near the university run by an intellectual clergyman, he was able to continue residing in the college and doing more scientific work.⁵⁶ Ordained in June 1882, he resigned from St Michael's in January 1883 and was appointed parish priest of Holy Trinity, Glen Innes, in northern New South Wales.⁵⁷ He returned in Sydney in 1885, the following year going to England.⁵⁸ While there he was the Society for the Propagation of the Gospel 'Deputy and Locum Tenens, Long Wittenham (Oxon.) and Laleham (London)'.⁵⁹ During his time in England he 'lectured and preached in 400 centres, including the Cathedrals of Lincoln, Ely and St Asaph'.⁶⁰ After returning to Sydney in 1889, in October that year he was appointed *locum tenens* at St Jude's, Randwick, a middle class parish in Sydney's eastern suburbs, and one year later became minister in charge of the mission

⁵² Branagan, p. 26.

⁵³ Branagan, p. 19.

⁵⁴ *Crockford's Clerical Directory* (Oxford, 1906), p. 224.

⁵⁵ Branagan, pp. 22, 35.

⁵⁶ Campbell, *Autobiographical Sketch*, [p. 5]; Kenneth Cable to Philip Hart, 8 April 1988.

⁵⁷ *Crockford's Clerical Directory*, p. 224; *Cyclopedia of New Zealand*, vol. 3, p. 194.

⁵⁸ Kenneth Cable to Philip Hart, 8 April 1988; *Australian Mining Standard*, 15 July 1897, p. 2031; Campbell, *Autobiographical Sketch*, [p. 7].

⁵⁹ *Cyclopedia of New Zealand*, vol. 3, pp. 194-195.

⁶⁰ Campbell, *Autobiographical Sketch*, [p. 7].

district of St Nicolas, Coogee, carved out of Randwick parish.⁶¹ He held this post until 1897, devoting 'his Sundays and spare hours on week-days with a view of building up this parish and making it capable of maintaining a clergyman'.⁶² Throughout his working life, apart from being a parish priest four times for periods of from three to five years, all his church work was honorary, or at least 'almost gratuitously'.⁶³

Campbell's library contained 'a large quantity of well know theological books'.⁶⁴ In 1884, his first religious pamphlet, of 12 pages, was published: *Confirmation Series 1 No. 1* (it had no successors).⁶⁵ In 1895 he published two of his sermons on 'difficulties of belief'. The first was entitled *Creation; or Moses and Geology* and the second *Evolution and the Antiquity of Man – A Sermon*.⁶⁶ His *Christian Philosophy, or Difficulties of Belief*, published in the following year, contained seven sermons, including these two. Campbell informed the Auckland press that he believed this booklet was 'the first time that such an attempt has been made in Australia to show the harmony between science and revelation'.⁶⁷ In April 1898, when at Te Aroha, he again preached his sermon on Moses and geology. He was an evolutionist because the universe developed slowly, a 'day' in *Genesis* being millions of years. After claiming that science and religion were in agreement about creation, he stated that 'evolution did not teach that man progressed from a tadpole stage to that of a superior ape, and finally man'. Geology had proved that *Genesis* had the stages of creation in the right sequence.⁶⁸

In 1896, Campbell said that he 'took holy orders because he believed that science and theology should go hand in hand'.⁶⁹ Seven years later he repeated that being a clergyman meant he could 'show the harmony existing between science and religion'.⁷⁰ In 1922, he wrote that he became a clergyman 'not as a living, but to bring science to bear on Theology, and to

⁶¹ *Crockford's Clerical Directory*, p. 224; *Cyclopedia of New Zealand*, vol. 3, p. 195; Kenneth Cable to Philip Hart, 8 April 1988.

⁶² *Australian Mining Standard*, 15 July 1897, p. 2031.

⁶³ Campbell, *Autobiographical Sketch*, [pp. 5, 6]; *Cyclopedia of New Zealand*, vol. 3, p. 195.

⁶⁴ John Lewis (Bishop of North Queensland) to Philip Hart, 6 April 1988.

⁶⁵ Branagan, pp. 29, 35.

⁶⁶ Branagan, pp. 29-30.

⁶⁷ *Auckland Weekly News*, 4 July 1896, p. 18.

⁶⁸ *Te Aroha News*, 2 April 1898, p. 2, 5 April 1898, p. 2.

⁶⁹ *Auckland Weekly News*, 25 July 1896, p. 29.

⁷⁰ *Cyclopedia of New Zealand*, vol. 3, p. 195.

help the Church in my leisure'. After referring to disapproval by most of the North Queensland hierarchy of his 'broad teaching', he added: 'It matters not, for Science rules the roost, and henceforth my lectures will be on the broad principles of the early Christian Church, the keynote being "The Service of Man"'.⁷¹ The cover of this pamphlet featured a photograph of Campbell in academic dress and a clerical collar, holding a scroll, within an equilateral triangle with the slogan 'The Rendezvous of Science, Industry, Christianity'. Two Latin phrases were included that had 'dominated' his life 'for more than a quarter of a Century': 'I am a man, and all that concerns men, concerns me' (Terence), and 'I appear before you in a threefold attitude' (Cicero).⁷²

Not all his beliefs were orthodox: when aged 20 he wrote his first paper on the spirit world.⁷³ In 1902 he published his last religious book, three sermons delivered in Christchurch, under the title *In the Spirit World*.⁷⁴ One included a quotation from the late Primate of New Zealand just before 'passing out of our sight to a higher sphere of the spirit world'.⁷⁵ His views on Masonry could also be seen as eccentric. At a Masonic service at Waihi in 1900, he stated 'that the blacks of Australia for thousands of years had handed down the secrets and preached the same teachings as were observed by the Masons of modern times', a theory that amused a columnist,⁷⁶ and may have bemused Masons.

Occasionally he criticized his church, as in 1897, when he told a parishioners' meeting it was 'monstrous' in a progressive place like Te Aroha that women could not elect church members. He blamed this on a misreading of the Bible, for 'it was never intended to prevent Christian women from taking an active part in matters pertaining to the welfare of the church. We really could not get on without the ladies for they had ever been to the fore in all Christian organizations'.⁷⁷ A stronger attack was made in an 1894 lecture, when he referred to the need to eliminate 'that detestable selfishness which ruins everything both in Church and State. Church and State I say. The whole system of both needs renewing. Both are

⁷¹ Campbell, *Autobiographical Sketch*, [p. 6].

⁷² Campbell, *Autobiographical Sketch*, cover.

⁷³ Joseph Campbell, *In the Spirit World* (Christchurch, 1902), p. 21.

⁷⁴ Campbell, *In the Spirit World*; Branagan, pp. 30, 35.

⁷⁵ Campbell, *In the Spirit World*, pp. 43-44.

⁷⁶ 'Mercutio', 'Local Gossip', *Auckland Weekly News*, 6 July 1900, p. 7.

⁷⁷ *Thames Advertiser*, 26 July 1897, p. 3.

more or less corrupt, and, as I have just hinted, through selfishness'.⁷⁸ This cryptic reference to corruption in the church was neither explained nor repeated.

ALFRED ANDREW LOCKWOOD AND HIS PROCESS

Campbell's interest in the treatment of refractory ores would lead to his involvement with mining at Te Aroha because of an invention by a New Zealand miner, Alfred Andrew Lockwood, who was 49 in 1896, the year Campbell first visited Te Aroha.⁷⁹ After minor involvement in the New Zealand land wars of the 1860s,⁸⁰ Lockwood had, according to an 1888 article, 'a large experience in all the operations connected with gold mining'. It stated he was on the Thames and Coromandel goldfields from 1867,⁸¹ although the date of his first miner's right for Thames was 8 March 1869.⁸² In 1870, and possibly for a year or two longer, he was a coach proprietor at Tauranga.⁸³ From 1873 to 1881 had large interests in several mines at Coromandel, and from 1874 to 1877 was actively involved in mining there.⁸⁴ At Waiorongomai, he owned 17 of the 34 shares in the Wallaby in 1882, selling this interest in an unsuccessful claim to a sharebroker the following

⁷⁸ Cited in Branagan, p. 30.

⁷⁹ Marriage Certificate of Alfred Andrew Lockwood, 5 December 1870, 1870/4959, BDM; Notices of Intentions to Marry 1870, Births Deaths and Marriages, BDM 20/15, folio 158, ANZ-W.

⁸⁰ Maori War Index, MW 3398, Army Department, AD 32; Applications by Militia for Land, 1882, no. 1420, Lands and Survey Department, LS 65/5, ANZ-W; *New Zealand Gazette*, 31 May 1871, p. 253.

⁸¹ *Auckland Weekly News*, 7 July 1888, p. 22.

⁸² Thames Warden's Court, Register of Miners' Rights 1868-1869, no. 1186, BACL 14358/3a, ANZ-A.

⁸³ Marriage Certificate of Alfred Andrew Lockwood, 5 December 1870, 1870/4959, BDM; Notices of Intentions to Marry 1870, Births Deaths and Marriages, BDM 20/15, folio 158, ANZ-W.

⁸⁴ Coromandel Warden's Court, Register of Claims 1872-1885, folios 4, 15, 36, 47, 48, 61, 80, 90, ZAAAN 14044/1a, ANZ-A; Bank of New Zealand, Coromandel Branch, Gold Dealer's Register 1874-1890, entries for 30 March 1874, 19 March 1875, 18 June 1875, 6 January 1876, 20 March 1876, 22 May 1876, 11 January 1877, Bank of New Zealand Archives, Wellington; *New Zealand Gazette*, 29 September 1881, p. 1239, 13 October 1881, p. 1293; *Coromandel Mail*, 8 October 1881, p. 1.

year for £20.⁸⁵ The only other claim that he owned there, with a partner, was the British; it was forfeited for non-working nine months later.⁸⁶ Apart from this minimal involvement with Waiorongomai, most of the claims he partly owned between 1881 and 1888 were in Ohinemuri.⁸⁷ In 1883 he was a director of the Nevada and Wolseley Companies at Karangahake.⁸⁸ The following year, he was a member of a party tributing in the Nevada.⁸⁹

In 1884, when suing for the forfeiture of a claim Lockwood had pegged out but not registered, the mining inspector described him as a ‘wholesale pegger-out of goldfield land’.⁹⁰ If that comment implied that he pegged out claims without intending to work them, in some cases at least this was incorrect. When one of a party owning the Yellow Jacket at Waihi in 1886, a mining reporter considered he deserved ‘great credit for the pluck and determination he has shown in developing his mine’.⁹¹ A month later, he was successfully prospecting a claim he had purchased at Karangahake.⁹²

Like others, he attempted to sell claims on the English market,⁹³ sometimes because of his financial difficulties. When at Coromandel, he had had to supplement his mining with house painting,⁹⁴ and in 1879, when he filed as bankrupt, his liabilities were £113 and his assets £20.⁹⁵ In 1883 and 1885, as another way to make money, he unsuccessfully prospected for coal at Ohinemuri and Te Mata.⁹⁶

⁸⁵ Te Aroha Warden’s Court, Register of Licensed Holdings 1881-1887, folio 123, BBAV 11500/9a; Transfers and Assignments 1883, no. 353, BBAV 11581/4a, ANZ-A.

⁸⁶ Te Aroha Warden’s Court, Register of Licensed Holdings 1881-1887, folio 47, BBAV 11500/9a; Letterbook 1883-1900, p. 58, BBAV 11534/1a, ANZ-A.

⁸⁷ For example, *Thames Star*, 21 December 1881, p. 3; *New Zealand Gazette*, 15 June 1882, p. 861, 29 November 1883, pp.1704, 1705, 28 August 1884, p. 1318.

⁸⁸ Company Files, BBAE 10286/13h, 10286/13j, ANZ-A.

⁸⁹ *Thames Star*, 25 November 1884, p. 2.

⁹⁰ *Thames Advertiser*, 18 April 1884, p. 2.

⁹¹ *Thames Advertiser*, 7 June 1886, p. 2.

⁹² *Thames Advertiser*, 9 July 1886, p. 2; *Te Aroha News*, 10 July 1886, p. 3.

⁹³ *Thames Advertiser*, 5 April 1887, p. 2; *Waikato Times*, 12 May 1888, p. 2.

⁹⁴ Birth Certificate of Rachel Eliza Lockwood, 13 March 1875, 1875/2387, BDM.

⁹⁵ *Auckland Weekly News*, 24 May 1879, p. 17.

⁹⁶ Auckland Lands Board, Minute Book 1882-1884, Minutes of Meetings of 15 February 1883, p. 31, 15 March 1883, p. 44, 9 March 1883, p. 50, 12 April 1884, p. 61, 26 April 1883, pp. 69-70, 7 June 1883, p. 87, 11 October 1883, p. 150, BAAZ 4019, 12/1; Minute

When living at Karangahake from 1886 to 1888, Lockwood experimented with roasting quartz until he discovered a method of saving all the gold.⁹⁷ He explained it to Joshua Jackson, an Auckland mining agent and sharebroker,⁹⁸ but found that nobody was willing to finance the erection of a furnace. He was advised to explain his process to Frederick Brown, Professor of Chemistry at Auckland University College, who had been experimenting for some years to solve the problems of treating local ores. When Brown used Karangahake ore in an ordinary reverberatory furnace and one using Lockwood's principle he had a nil result from the former whereas Lockwood's produced 164oz of bullion to the ton. By injecting steam into the furnace instead of using fluxes, Lockwood believed he prevented 'the volatilization of the metal', and because 'a large quantity of the bullion' was non-metallic, it could be 'dealt with in the subsequent stages'. Brown, who had 'made several experiments in connection with' Lockwood's process, was 'convinced' it was 'of value' and 'well worth a trial on a large scale'. At first Brown had not thought much of Lockwood's invention, for others had applied steam to the roasting process without success. Although impressed with the result of his trial, as less than half the bullion was extracted he believed the ore should be crushed and pulverized before roasted. He emphasized it was 'impossible, so far', to determine whether the process was valuable; further experiments were required. Plans to roast five tons at Onehunga would not be 'of any value', as this test would not be conducted under adequate conditions for reliability: the Thames School of Mines was the appropriate place.⁹⁹ As its facilities were not utilized and the results of the Onehunga tests were not published, a poor outcome must have resulted.

In mid-1888, Lockwood applied for a patent for 'an invention for the treatment of gold and silver ores, to be known as "Lockwood's Eureka Roasting Furnace" ', and, with James McGuire, for 'an invention for saving gold and silver, to be called "the Lockwood-McGuire Combination Process for the Extraction of Gold and Silver from Refractory or other Ores" '.¹⁰⁰

Book 1884-1887, Minutes of Meeting of 31 December 1885, p. 174, BAAZ 4019, 12/2, ANZ-A; *Thames Advertiser*, 16 June 1883, p. 2.

⁹⁷ *Auckland Weekly News*, 7 July 1888, p. 22.

⁹⁸ See *Cyclopedia of New Zealand*, vol. 2, pp. 469-470; *New Zealand Herald*, 23 December 1907, p. 8; *Observer*, 28 December 1907, p. 5.

⁹⁹ *Auckland Weekly News*, 7 July 1888, p. 22.

¹⁰⁰ *New Zealand Gazette*, 21 June 1888, p. 695, 12 July 1888, p. 758.

McGuire, a fellow Ohinemuri miner who had also participated in the Te Aroha rush,¹⁰¹ contributed money, not ideas. He later stated that Lockwood had devised the process in 1887,¹⁰² the year before they placed their Jubilee mine at Waitekauri on the London market.¹⁰³

After his patent was applied for, Lockwood went to Auckland to make arrangements to erect a furnace and other machinery to test his system on a larger scale and to patent his discovery in other countries. According to the *Thames Advertiser*, Lockwood,

a well-known and long resident in the upper country, has for some time past devoted his time and attention to the treatment of our refractory ores and we believe, has succeeded in introducing a process of saving some 90 per cent of Bullion at a cost of about 15s per ton. Having asked several of the leading men in Auckland to assist him in trying his process on a more extensive scale, without meeting with the required assistance, he has offered the inducement to Australian capitalists, who have accepted his terms.

As a result he went to Sydney to supervise the erection of the machinery,¹⁰⁴ for Auckland capitalists would not support him 'except on such terms as were not equitable, that is to say capital wanted the lion's share of the results'. In Sydney, people 'were more liberal in their estimation of the value of brain work'. Herbert Chappell (whose surname was printed in a variety of spellings) 'took the matter up on terms satisfactory to both parties', for once capitalists were convinced 'the invention was what it was represented to be ... the necessary capital was immediately forthcoming'.¹⁰⁵ Herbert Chappell, a land and mining agent,

¹⁰¹ See Te Aroha Warden's Court, Miner's Right no. 320, issued 25 November 1880, Miners' Rights Butt Book 1880, BBAV 11533/1a; Register of Te Aroha Claims 1880-1888, folio 192, BBAV 11567/1a, ANZ-A; *Thames Advertiser*, 28 October 1880, p. 3, 6 December 1880, p. 2, 28 May 1897, p. 2; *Waikato Times*, 24 December 1887, p. 2.

¹⁰² Bankruptcy Files, BBAE 5628/5, 93/33, ANZ-A.

¹⁰³ *Waikato Times*, 12 May 1888, p. 2.

¹⁰⁴ *Thames Advertiser*, 17 August 1888, p. 2.

¹⁰⁵ *Thames Advertiser*, 11 January 1889, p. 2.

was 'well known in Sydney'.¹⁰⁶ Whilst in Australia, Lockwood exhibited his plant at the Melbourne Exhibition.¹⁰⁷

In December 1888, it was announced that he had been successful in getting a 'powerful syndicate to back him' and would be returning 'with a gentleman of means' who would meet the cost of erecting a plant at Waitekauri.¹⁰⁸ Chappell came to Thames in January, the month that Lockwood, now described as a mine manager, applied for a patent for 'Lockwood's Improved Carbonated Hydrogen Furnace'. Three weeks later he applied for 'Lockwood and Chappell's Carbonated Hydrogen Furnace';¹⁰⁹ all Chappell provided to have a share in the patent was finance. He was seeking the most suitable site to erect a larger plant, and the working model made in Auckland would be brought to Thames for inspection. It had been patented 'all over the world', even Germany where 'the refractory ores of the Thames had been most successfully dealt with'. His process had been 'partially pirated in Adelaide' after being described in the press. The cost of treatment would never exceed £1 per ton, and existing machinery could be altered at small cost. The *Thames Advertiser* wrote that, if 'as satisfactory as there appears to be every reason to hope', it was 'safe to predict that the gloom which has hung over and stagnated the Thames for some years will soon be a thing of the past'.¹¹⁰

The plant was erected at Waitekauri under the supervision of Lockwood and a mine manager. A correspondent wrote that his invention was becoming 'widely known', and was patented all over the world:

Mr Lockwood is to be congratulated on the strides he has made in his profession, and on the manner in which, after battling against the prejudice shown to him by many pseudo-scientists, he has made his process an undoubted success. As soon as the arrangements for patenting have been completed in Germany and England, the syndicate in Sydney, which controls the plant, will erect furnaces and plants at various centres throughout these and other goldfields.¹¹¹

¹⁰⁶ *New Zealand Gazette*, 31 January 1889, p. 122; Ohinemuri Correspondent, *Waikato Times*, 3 September 1889, p. 3; *Te Aroha News*, 15 March 1890, p. 2.

¹⁰⁷ *Te Aroha News*, 11 August 1888, p. 2.

¹⁰⁸ Ohinemuri Correspondent, *Te Aroha News*, 12 December 1888, p. 2.

¹⁰⁹ *New Zealand Gazette*, 10 January 1889, p. 22, 31 January 1889, p. 122.

¹¹⁰ *Thames Advertiser*, 11 January 1889, p. 2.

¹¹¹ Ohinemuri Correspondent, *Waikato Times*, 1 June 1889, p. 2.

In August, the starting of the Australian Gold and Silver Extraction Company's plant was celebrated with a luncheon at which the Sydney investors were spoken of 'in eulogistic terms'. The description of the plant revealed that 'none of the modern processes or machinery have been adopted. In this age of progress this will be wondered at, as a large quantity of the ore in this district is refractory, and will not give up all its gold and silver by the ordinary battery process such as the Australian Co. have erected'. At first the owners would extract only the free gold from the poorer ores, but would soon turn their attention to gold and silver 'in other forms than metallic'. As the 'Lockwood' process was expected to 'eclipse all others in effectiveness and cheapness', it was 'more than probable' it would 'be adopted at Waitekauri'.¹¹² This prophecy was not fulfilled, and the Sydney investors, after spending nearly £1,000 in erecting the battery and working the ground, had to abandon their Australian Special Claim.¹¹³ A crushing of 200 tons producing 3 1/2oz of gold proved the stone had no value, and mining was abandoned after only a few weeks.¹¹⁴ To obtain payment for erecting the ten-stamp battery, in mid-March 1890 A. & G. Price of Thames successfully sued Chappell, Lockwood, and Charles Jackson Campbell, all described as mining agents of Sydney, and McGuire. In consequence, the company's property was sold for £265, Lockwood and party forfeiting their ground.¹¹⁵

In September 1889, it was announced that Lockwood was going to Sydney to take charge of the plant erected there by Chappell's syndicate, which had taken over his patent. It was claimed that Lockwood in treating over 150 samples from Thames and Ohinemuri had 'saved from 87 to 90 per cent of the fire assay value'. His process had been patented 'in all European countries and English and Spanish colonies'. He was taking 'one ton of Maratoto ore on which to experiment. Parcels from the leading Australian mines will be treated in Sydney also'.¹¹⁶

Clearly, over a year after being patented, his process was still being tried only on small samples under experimental conditions. The following

¹¹² 'From Our Correspondent', *Thames Star*, 13 August 1889, p. 4.

¹¹³ Bankruptcy Files, BBAE 5628/5, 93/33, ANZ-A.

¹¹⁴ *AJHR*, 1890, C-3, p. 149.

¹¹⁵ *Te Aroha News*, 15 March 1890, p. 2, 22 March 1890, p. 2; *Thames Advertiser*, 20 March 1890, p. 2, 30 May 1890, p. 2.

¹¹⁶ Ohinemuri Correspondent, *Waikato Times*, 3 September 1889, p. 3.

February, Lockwood announced the trials of his furnace had been successful.¹¹⁷ The *Sydney Daily Telegraph* reported his experimenting 'upon the worst specimens which it was believed could be obtained', being full of base metals. 'Some months ago trials were made with the machinery, but for various reasons none came off so successfully as that of Saturday, chiefly owing to the defective apparatus for carrying off the fumes of the base metal'. It described charging the retorts with carbon, producing carbonic oxide and hydrogen, otherwise carbon monoxide,¹¹⁸ when superheated steam was injected. 'By this means all the baser metals are volatilized and pass away into flumes from which they are subsequently collected in crystallized form'. The residue was treated in the normal way, returns in many cases exceeding 'over 50 per cent those obtained by any other method'. Improvements made within the past few weeks had considerably improved the machinery. As the plant was 'of course on a very small scale, and merely intended to illustrate the merit of the invention', plans had been made 'to erect extensive works at a more convenient site, and in such cases the ores can be treated in greater bulk, as the furnaces will be much larger'.¹¹⁹

In May, an Auckland newspaper cited the satisfactory treatment of two tons from an unspecified Australian mine (the Sir Walter Scott at Cangai?), announced that Lockwood was now able to treat material in bulk, and recommended that miners with unpayable ore send trial lots for him.¹²⁰ The mining community was unenthusiastic, as 'Obadiah' noted when writing of a new process being used at Puhipuhi, an unsuccessful mining district north of Whangarei. 'Roasting rocks in an iron pipe' was 'nothing new', having been patented by Lockwood. 'Experts could always get splendid returns, but somehow the mining community did not take to it'.¹²¹

In January 1891, Lockwood wrote to the *New Zealand Herald* about the mining industry urging the government to purchase the patent for the cyanide process. He argued that any process on which public money was to be spent must be more effective and cheaper than any other:

¹¹⁷ *Waikato Times*, 20 February 1890, p. 2.

¹¹⁸ Branagan, p. 27.

¹¹⁹ *Daily Telegraph* (Sydney), 4 February 1890, reprinted in *Auckland Weekly News*, 1 March 1890, p. 30.

¹²⁰ *Auckland Weekly News*, 3 May 1890, p. 14.

¹²¹ 'Obadiah', 'Shares and Mining', *Observer*, 29 August 1891, p. 14.

But, perhaps, as the process to which I am able to call attention is the invention of colonists, it will - instead of on that score meeting with encouragement - be pooh-poohed, and have the cold shoulder turned to it. Nevertheless, I fearlessly affirm that Lockwood and Chappell's process ... possesses the desired requisite to a greater degree than any other process as yet introduced to the public. The patentees having demonstrated the capabilities of their invention for treating refractory ores in bulk in New South Wales, are now entering largely into arrangements with different mining companies for the erection of plants in that colony, to be followed by similar ones in the other colonies; and I certainly think that the public should examine exhaustively into the merits and capabilities of both these processes, and carefully compare them before hastily committing itself to what may turn out to be something of the "white elephant" sort.¹²²

Brave words when the cyanide process was proving its worth. He was next heard of in March 1892, when a mining agent and investor, John Featon,¹²³ reported that Lockwood was at Gulgong, New South Wales, with his patent furnace. He had also started a soap factory for washing wool, was doing well, and desired to be remembered to his old friends.¹²⁴ In 1893, Lockwood's patent for his ore roasting furnace lapsed for non-payment of the renewal fee,¹²⁵ suggesting either a lack of success or that he had devised a better one. After McGuire was forced to file as a bankrupt in July,¹²⁶ largely because of his involvement in the Australian mine at Waitekauri, his statement revealed the reality behind the encouraging statements. 'In or about the year 1887 I joined one Alfred A Lockwood in launching a patent for a Gold-saving process discovered by him and altogether expended a sum of about £70, - some portion of which I borrowed. This Patent has so far proved a failure'.¹²⁷

In 1895, Lockwood, then living in Auckland, described himself as a 'mining expert'.¹²⁸ In October, when his occupation was given as

¹²² Letter from A.A. Lockwood, *New Zealand Herald*, 15 January 1891, p. 3.

¹²³ See *New Zealand Gazette*, 24 October 1895, p. 1704, 12 December 1895, p. 1926, 9 July 1896, p. 1097, 26 November 1896, p. 1992; *Thames Advertiser*, 22 May 1896, p. 4, 21 May 1897, p. 2; *Observer*, 22 August 1896, p. 24.

¹²⁴ *Ohinemuri Gazette*, 26 March 1892, p. 2.

¹²⁵ *New Zealand Gazette*, 14 September 1893, p. 1364.

¹²⁶ *New Zealand Gazette*, 20 July 1893, p. 1133.

¹²⁷ Bankruptcy Files, BBAE 5628/5, 93/33, ANZ-A.

¹²⁸ *New Zealand Gazette*, 24 October 1895, p. 1704.

metallurgist, he applied for two patents, this time with Arthur Edward Langley, who owned a claim at Tui.¹²⁹ Formerly a storekeeper at Kawhia, Langley was now an Auckland commission agent.¹³⁰ Like Lockwood's previous associates, he provided funds, not ideas. The patents were for 'improvements in certain descriptions of pulverizing- and amalgamating-pans, herein entitled "Improved Central Discharge Ore-grinding Pan" ', and an 'improved amalgamating-pan for treating finely-divided metalliferous material'.¹³¹ These were the Lockwood-Nicholson pans, which had 'attracted a great deal of attention in Australia'.¹³² They had indeed; three years previously the *Australian Mining Standard* described these 'grinding and amalgamating continuation pans' as 'the most perfect of their kind'.¹³³ Manufactured in New Zealand by an Auckland ironfounder, their first testing, of Mercury Bay ore, 'attracted a good deal of attention amongst mining men' because they not only ground ore but amalgamated and concentrated. The grinders were 'an improvement on the McKay pans' used at Thames for many years. According to Lockwood, Australian tests had proved they saved from 90 to 97 per cent of the gold.¹³⁴ In March 1896, he applied for an 'improved process for treating refractory auriferous, argentiferous, or other ores by roasting in a reducing atmosphere'.¹³⁵

CAMPBELL AND LOCKWOOD

According to Campbell, Lockwood's process was submitted to him 'for examination' in 1890:

It was then in a very crude state, but, as I was convinced of its value, I bestowed careful attention upon the matter, and having fully demonstrated the efficacy of the treatment, applied it on a large scale to ores containing 20 per cent of arsenic and zinc, lead, copper, and iron sulphides, with the result that I saved 95 per

¹²⁹ *AJHR*, 1897, C-3, p. 98.

¹³⁰ See *Waikato Times*, 22 September 1883, p. 2, 12 March 1887, p. 2, 9 January 1890, p. 2, 13 October 1892, p. 2, 6 April 1893, p. 2. 2 July 1924, p. 7; *New Zealand Gazette*, 17 October 1895, p. 1655, 7 November 1895, p. 1770.

¹³¹ *New Zealand Gazette*, 31 October 1895, p. 1741.

¹³² *Auckland Weekly News*, 4 April 1896, p. 10.

¹³³ *Australian Mining Standard*, n.d., cited in *Auckland Weekly News*, 3 June 1893, p. 21.

¹³⁴ *Auckland Weekly News*, 4 April 1896, p. 10.

¹³⁵ *New Zealand Gazette*, 5 March 1896, p. 432.

cent of the assay value, viz, 1oz 15dwt against 11dwt by battery or pan amalgamation.

Having recently brought the furnace in connection with the process to perfection, I took out patents for the treatment in every country of importance, and applied to it the distinctive name of "Thermo-Hyperphoric Treatment."¹³⁶

He told a Te Aroha audience in 1896 that 'hyperphoric' was 'derived from a Greek word, and signifies first, that which is pre-eminent, and second, that which produces a change by the elimination of certain base substances that prevent the amalgamation of gold with quicksilver'. Mining was 'principally indebted' to Lockwood for creating 'the best process of all', which would be 'universally adopted in the near future'.¹³⁷ An 1893 article claimed that for 'many' years Campbell had 'taken a very active interest in the Lockwood-Chappell process', and 'at the request of the patentees' selected 'hyperphoric' as the 'most suitable' name.¹³⁸ Three years later, Campbell told an Auckland journalist that when he first met Lockwood 'some years ago' he was 'much impressed with his system' even though it was 'very crude'. 'In my spare hours I thought it out, and he and I together have brought it to something approaching perfection'. He had 'no hesitation' in saying it would save 95 per cent of the gold in all the ore he had seen at Te Aroha.¹³⁹ He expected it would be 'universally adopted. There was nothing very new about the process, which was known as far back as 1861, but until recently it had never been reduced to a system'.¹⁴⁰ Applying it to treating ore was new, as was the method of application.¹⁴¹ Two years later, he said that from about 1890 he had made 'careful and lengthy experiments' based on Lockwood's system, 'first in his laboratory on a small and experimental scale. After surprises and disappointments he brought his treatment to something approaching perfection', and 'from then to the present day further perfection has been sought'.¹⁴²

¹³⁶ Campbell, *Simple Tests*, p. 62.

¹³⁷ *Ohinemuri Gazette*, 4 July 1896, p. 5.

¹³⁸ *Australian Mining Standard*, n.d., reprinted in *Auckland Weekly News*, 3 June 1893, p. 21.

¹³⁹ *Auckland Weekly News*, 25 July 1896, p. 29.

¹⁴⁰ Te Aroha Correspondent, *New Zealand Herald*, 2 July 1896, p. 6.

¹⁴¹ *Auckland Weekly News*, 25 July 1896, p. 29.

¹⁴² *New Zealand Mines Record*, 16 July 1898, p. 526.

CAMPBELL'S PROCESS

In 1896, Campbell told an Auckland journalist that he did not 'say one word in disparagement of other processes'.

I wish all success, but I commend the hyperphoric treatment to the attention of scientific and practical men. It is scientific, and it is eminently practical. I have treated, often working with my own hands, 150 tons of ore more refractory than most of what I have seen in New Zealand, and I always got more than three times as much gold as was yielded by battery treatment.¹⁴³

He omitted to warn that what worked in the laboratory often did not work in the battery. In the 1898 edition of *Simple Tests for Minerals*, he wrote that the economical treatment of refractory gold ores was 'of the greatest commercial importance', and his 'special attention' to this problem had produced 'very satisfactory results'.¹⁴⁴ After summarizing the cyanide, bromo-cyanide, and chlorination processes, he noted that, although they worked well with some classes of ore but failed with others, 'even when successful, the length of time occupied and the manifold operations involved' increased the cost so much that 'some improvement' was 'very desirable'.¹⁴⁵ Having 'devoted several years to this question' he could 'speak with some authority' that 'all refractory ores, whether amenable to the above methods of treatment or not', could yield from 90 to 95 per cent of the gold 'at a cost of from 5s to 10s per ton by treating the ore previous to amalgamation' with what was 'popularly known as *water-gas* in closed furnaces'.¹⁴⁶ The full name, 'thermo-hyperphoric', correctly described the process, for the base elements interfering with the amalgamation of gold with mercury were eliminated by water gas. When steam was conveyed over red-hot coke, this gas was formed and conducted into closed furnaces containing crushed ore. After the furnace was heated to from 1200 to 1800 degrees Fahrenheit for from two to four hours, depending on the complexity of the ore,

¹⁴³ *Auckland Weekly News*, 25 July 1896, p. 29.

¹⁴⁴ Campbell, *Simple Tests*, p. 59.

¹⁴⁵ Campbell, *Simple Tests*, pp. 59-61.

¹⁴⁶ Campbell, *Simple Tests*, p. 61.

all impurities which interfere with the amalgamation of the gold are removed or are so modified by the chemical action of the gases, that the precious metal is left quite pure. The ore is then crushed and amalgamated by an improved method. The complete treatment costs less than 10s per ton – in ordinary cases only 5s – and, by reason of its simplicity, its effectiveness, and its cheapness, it cannot fail to become the popular method of dealing with refractory gold-bearing ores. This is the opinion of the English metallurgists to whom I have recently submitted the process.¹⁴⁷

Asked for details by an Auckland journalist, he gave them at length, including the chemical formulae involved in separating superheated steam into hydrogen plus oxygen combined with carbon in the form of carbonic oxide. This gas then passed amongst ore ‘broken to the size of walnuts’. At 1200 degrees, ‘all the sulphur, arsenic, antimony, zinc, tellurium, iron oxide, or any other substance’ that interfered with amalgamation was eliminated.¹⁴⁸

Campbell took out his only New Zealand patent in October 1896, for ‘improvements in the method of, and apparatus for, treating refractory gold- and silver-bearing ores and materials’.¹⁴⁹ Detailed specifications were provided:

The positive results of the treatment of the ore or material by water-gas in closed chambers or retorts, are - (a) The ore or material becomes exceedingly friable, much more so than the best roasted quartz from open kilns, and may be easily broken by hand - thus the use of lighter stamps is permitted and easier grinding effected. (b) The auriferous particles are changed in form to a globular or approximately globular condition (the more minute the metallic particles the more perfect the spheroidal shape). The gold in this spheroidal form is less acted on by water in the amalgamating process, and hence the loss in the form of float-gold is reduced to a minimum. (c) The base materials with which the gold is chemically or mechanically combined or coated, namely, sulphur, arsenic, tellurium, antimony, bismuth, zinc, lead, iron and copper pyrites, iron oxide, etc., are eliminated, and leave the gold perfectly free for amalgamation. In addition to this, by

¹⁴⁷ Campbell, *Simple Tests*, p. 62.

¹⁴⁸ *Auckland Weekly News*, 25 July 1896, p. 29.

¹⁴⁹ *New Zealand Gazette*, 15 October 1896, p. 1730.

means of flues and suitable chambers, bye-products may be saved and so reduce the cost of treatment.¹⁵⁰

CANGAI

In July 1889, Campbell had presented the Government Geologist in New South Wales, Charles Smith Wilkinson, with a share in his patent, which was on the same principle that Wilkinson's father had patented in 1857. Five days later, they observed Chappell's model furnace treating 'pyritous stone'. In December, Wilkinson inspected Chappell and Lockwood's process.¹⁵¹ In November 1890 'very favourable reports' were received from the Sir Walter Scott mine, where the erection of a battery on Lockwood's design was 'being pushed on vigorously'.¹⁵² It was at Cangai, 'on the Mitchell River or South River, a tributary of the Clarence River, and 50 miles from Grafton',¹⁵³ in northern New South Wales. The erection of the battery cannot have been very vigorous, for not until late 1892 did Campbell and Lockwood arrive at Cangai to superintend the erection of the machinery and 'appliances' of the Lockwood-Chappell patent. Campbell was 'confident' that the yield would 'increase from about 15dwt under the old mode to 4oz of gold per ton'.¹⁵⁴ In June 1893 an article in the *Australian Mining Standard* that was reprinted in Auckland stated that 'the importance of the experiment cannot be over-estimated'. Campbell had been invited to inspect the mine because the ordinary battery treatment extracted little of the value. 'The inspection was followed by experiments, which showed this treatment was the best that could be applied, so the erection of a complete plant was decided on', Campbell undertaking to superintend the whole' while Lockwood was entrusted with 'most of the practical work'. The amalgamating pans used were 'the Lockwood-Nicholson patent'.¹⁵⁵ In Campbell's words, 'in order to give this matter a fair test', he

¹⁵⁰ Joseph Campbell, 'The Gold-Fields of the Hauraki Peninsula, New Zealand', *Transactions of the Institute of Mining Engineers*, vol. 12 (1896), p. 481.

¹⁵¹ Branagan, pp. 27-28.

¹⁵² *Australian Town and Country Journal*, 15 November 1890, p. 25; *Ohinemuri Gazette*, 4 July 1896, p. 5; *Auckland Weekly News*, 25 July 1896, p. 29.

¹⁵³ Campbell, *Gold, and How to Get It*, p. 15.

¹⁵⁴ *Australian Town and Country Journal*, 5 November 1892, p. 15.

¹⁵⁵ *Australian Mining Standard*, n.d., reprinted in *Auckland Weekly News*, 3 June 1893, p. 21.

and Lockwood spent four months erecting the plant. 'We had frightful difficulties to contend against owing to the floods and persistent rains which increased the cost of erection of the furnaces. But a complete ore-treating plant was erected at a cost of £1400'.¹⁵⁶ As it treated nearly 40 tons a week at a cost of between 8s or 9s per ton, he claimed that 'the mine, which was virtually abandoned, has become a most valuable property'.¹⁵⁷

In a lecture at Te Aroha he described the plant in detail:

First there were six air-tight retorts, above which are two large cast iron retorts used for the production of the gas. These are charged with ordinary charcoal, and the fireclay retorts are charged with 4cwt of ore, crushed by means of a Dodge stone-breaker to about the size of a walnut. The whole is raised by wood fuel to a temperature of 1200 deg.¹⁵⁸ Fahr[enheit]. Steam from the engine boiler passes along a pipe and enters the iron retorts. It is there split up, and forms hydrogen gas and carbonic oxide. These gasses then pass by means of pipes at the back to the fireclay retorts, and permeate the mass of heated ore. The result of the treatment is really very striking. The hydrogen and carbonic oxide seize upon the arsenic, sulphur, &c, and carry them away, leaving the gold perfectly free. My analysis, after six hours treatment, showed - from mineralised ore containing over 10 per cent of base material - 5/8 down to 3/8 per cent of sulphur, and 3/8 down to 1/8 per cent of arsenic, which small quantity is found not in any way to interfere with the amalgamation of the gold. This was, he considered, a great triumph; for the cost did not exceed 10s per ton, and with a large plant would be reduced to 5s or 7s per ton. There were also connected with the works three pans, two grinding and amalgamating pans, and one concentrator and amalgamator. The ore is very finely pulverized in the grinder, which saves a great portion of the gold, and the balance is saved in the amalgamator. The result of the treatment, after repeated trials, by the Hyperphoric process was a saving of 99 per cent of the gold contained in the ore, the yield being 1 3/4oz to the ton, whereas by battery process only 1/2oz could be saved. The cost of the plant mentioned, which was considerably increased by roads, &c, was close on £2000.¹⁵⁹

¹⁵⁶ *Auckland Weekly News*, 25 July 1896, p. 29.

¹⁵⁷ *Australian Mining Standard*, n.d., reprinted in *Auckland Weekly News*, 3 June 1893, p. 21.

¹⁵⁸ The *Ohinemuri Gazette* report gave a mere 120 degrees; the *New Zealand Herald* gave 12,000!: see *Ohinemuri Gazette*, 4 July 1896, p. 5; Te Aroha Correspondent, *New Zealand Herald*, 2 July 1896, p. 6.

¹⁵⁹ *Ohinemuri Gazette*, 4 July 1896, p. 5.

Although it could only treat 40 tons a week, he claimed success:

Unfortunately, the highest floods that had been known for years swept through the plant and destroyed the furnaces. This disheartened the shareholders and matters were at a standstill for a time. In fact, they concluded that the expense was too great, having mixed up the cost of erection of machinery and development of the mine, with the cost of treating the ore which never exceeded 5s per ton. The result was they were induced to try other treatment, and now they have been obliged to admit that the hyperphoric treatment is the best, and they will have to either readopt it or resort to the expensive method of concentration and treatment by smelting.¹⁶⁰

Lockwood and Campbell claimed their process had 'long since passed the theoretical and experimental stages' because the plant was producing the results they claimed.¹⁶¹ One year later, Campbell cited a letter from a director stating that, as his process 'had proved superior to all others for the treatment of refractory ore taken from that mine, arrangements had been made for the re-erection of a hyperphoric plant on a larger scale than the one which was destroyed by an unprecedented flood'.¹⁶² This flood had occurred in 1893,¹⁶³ four years previously, suggesting that the directors had doubts about using the process again. Despite Campbell's insistence that he had applied it 'with success',¹⁶⁴ historians have ignored the mine;¹⁶⁵ either the ore or the process was worthless. Had the plant in fact been re-erected and been a success, undoubtedly he would have mentioned this in his many speeches in New Zealand and in his self-promotion pamphlets of the early 1920s. One of the latter did cite a reference written for Campbell by Sir John See, Treasurer of New South Wales, which referred to his obtaining 1

¹⁶⁰ *Auckland Weekly News*, 25 July 1896, p. 29.

¹⁶¹ Te Aroha Correspondent, *Auckland Weekly News*, 11 July 1896, p. 30.

¹⁶² *Thames Advertiser*, 29 July 1897, p. 3.

¹⁶³ Campbell, *Gold, and How to Get It*, p. 18.

¹⁶⁴ *New Zealand Mines Record*, 16 July 1898, p. 526.

¹⁶⁵ See Isabel Wilkinson, *Forgotten Country: the story of the Upper Clarence gold fields* (Lismore, 1980); C.A.W. Baker, 'The History of Mining in New England', *Armidale and District Historical Society, Journal and Proceedings*, no. 14 (April 1971), pp. 64-75; R.B. Walker, *Old New England: A history of the Northern Tablelands of New South Wales 1818-1900* (Sydney, 1966).

3/4oz of gold per ton compared with 10dwt-15dwt from ordinary treatment, but also revealed that Campbell was only 'in full management' of the mine 'for some months'.¹⁶⁶

AN EXAMPLE OF SELF-PROMOTION

In early 1895, Campbell published *Gold, and How to Get It, or One Solution of the Unemployed Problem, Being a Popular Geological Lecture delivered in the Great Hall of the School of Arts, Sydney, New South Wales, on Monday Eve, December 3rd, 1894*. As it is a typical example of his self-promotion, even including the 'cheers' of his audience, the contents of the second, revised, edition are detailed here.

On the cover was a photograph of prospecting for gold on 'the Lachlan Tributaries', with the caption: 'A good show! Here, lads, is work for Hundreds'.¹⁶⁷ The Introduction to the second edition stated that 1,000 copies of the first edition were 'scattered about the colony'.

It was hoped that they would be *sold*, in which case the net proceeds were to be devoted to carrying out the plan suggested. Most of the copies have, however, been distributed gratis in order, if possible, to create a general interest in the movement. I am considerably out of pocket by the publication of the Lecture, and I hope that my friends will lend me their generous aid by purchasing a few copies of this edition to send or give to people who may be assisted by the information it contains.

'More help' was needed and 'greater enthusiasm' had to be created.

I have done all I can, having spared neither time, nor, as far as my means would allow, money in order to make the movement successful. I have been helped by many good friends, whom I now take the opportunity of thanking; but there are many large hearted people who have not yet helped, and to them I now appeal in the name of the welfare of suffering humanity.¹⁶⁸

His lecture commenced with the declaration that its subject was the most important one facing the colony. People needed work, and to provide

¹⁶⁶ Reference by Sir John See, n.d., printed in Campbell, *Autobiographical Sketch*, [p. 15].

¹⁶⁷ Campbell, *Gold, and How to Get It*, cover.

¹⁶⁸ Campbell, *Gold, and How to Get It*, p. 2.

this was ‘an undertaking worthy of the Churches. (Cheers)’.¹⁶⁹ It was a disgrace that unemployment existed, and one solution was to develop mineral resources, especially gold. These were ‘second to none in the world; and upon their development depends to a large extent the laying of the foundation of that industrial greatness which will make our Colony preeminently the flower of “The Land of the Golden Fleece.” (Cheers)’. He claimed that 92,000 square miles of it was auriferous, and gave details of areas containing other minerals.¹⁷⁰ Far too few men were employed in mining, proving that there was ‘something radically defective in the method employed for extracting gold’.

For twelve years past it has been one of the chief objects of my existence to teach practical mineralogy and economic geology. Sometimes at my own expense, sometimes under the auspices of the Technical Education Branch of Public Instruction, I have gone forth to country towns and the wild regions of the colony to impart that precious information which, first at my *Alma Mater* and subsequently as the result of much research and study both in Australia and Europe, I have been able to acquire. By popular lectures, by classes, by private interviews I have sought to remove the envelope of mystery by which many thought the subject was surrounded, and place my auditors in such a position that, with very little study, each might become his own “analyst,” and acquire such a knowledge of geology as would enable him to avoid falling an easy prey to designing mining adventurers or half educated and ill-instructed “mining experts” – so called. (Applause).¹⁷¹

He repeated his call for assistance, emphasizing that, through ignorance, many men living at places ‘containing rich treasures of gold’ could not find it.¹⁷² He praised Rev. William Branwhite Clarke as an ‘eminent geologist’ and a ‘noble fellow’ who was a pioneer discoverer of gold, perhaps implicitly posing as a similar clerical benefactor of mankind, and urged his listeners to ‘look not coldly on science, but call her to your aid’.¹⁷³

The next section detailed the geological history of the earth, the creation of metals and where these could be found in Australia, concluding

¹⁶⁹ Campbell, *Gold, and How to Get It*, p. 3.

¹⁷⁰ Campbell, *Gold, and How to Get It*, p. 4.

¹⁷¹ Campbell, *Gold, and How to Get It*, p. 5.

¹⁷² Campbell, *Gold, and How to Get It*, p. 6.

¹⁷³ Campbell, *Gold, and How to Get It*, p. 7.

with 'some excellent lime light views of the fossils' and advise to consult his *Simple Tests for Minerals* for more details.¹⁷⁴ After explaining how gold was formed into reefs or became alluvial, he showed limelight views of minerals and reefs.¹⁷⁵ Two of the illustrations were reproduced, being photographs by Campbell of the furnace and the Lockwood and Nicholson grinding pans erected at Cangai.¹⁷⁶ When showing these, Campbell proclaimed:

Ladies and Gentlemen, we now approach one of the most important questions connected with reef mining; and that is the method of extracting the gold from those refractory ores which are so abundant all over the world, and which have hitherto baffled all attempts to work them profitably.¹⁷⁷

'Many processes' had been suggested, some 'very good for certain classes of ore; especially Chlorination and Concentration and the Cyanide Process', but the 'best of all' was 'one which, when a few mechanical difficulties have been overcome, will, I feel sure, be universally adopted'. This was the hyperphoric process invented by Lockwood and Chappell.

The result of the treatment is truly striking. The Hydrogen and Carbonic Oxide seize upon the Arsenic, Sulphur, &c, and carry them away, leaving the gold perfectly free. With the assistance of one of the patentees, Mr Lockwood, I erected this plant and spent 4 months in the erection of the Works and the application of the treatment – working often night and day in order to give it a good trial.

After six hours' work he had proved it worked, at a cost of under 10s per ton: a larger plant might reduce this to 5s or 7s.¹⁷⁸ The Lockwood and Nicholson pans could treat at least 50 tons a week, and from 90 to 95 percent of the gold was saved: 1 3/4oz was obtained compared with 1/2oz by the ordinary process. As the plant was not erected above the flood mark, the floods of 1893 'did serious damage to the retorts; but not before it was clearly demonstrated' that the process was 'second to none of the world'. It would extract gold 'from refractory ores containing pyrites, arsenic, zinc

¹⁷⁴ Campbell, *Gold, and How to Get It*, pp. 8-11.

¹⁷⁵ Campbell, *Gold, and How to Get It*, pp. 11-14.

¹⁷⁶ Campbell, *Gold, and How to Get It*, pp. 14-15, 17.

¹⁷⁷ Campbell, *Gold, and How to Get It*, p. 14.

¹⁷⁸ Campbell, *Gold, and How to Get It*, p. 16.

blende, galena, tellurium, &c, however heavily charged'. He denied disparaging other processes, believing 'two or three' could, 'with proper management, accomplish much at a fairly cheap rate'.¹⁷⁹

As this point, he showed some 'very fine views' of life on the goldfields. He insisted that 'gold in unlimited quantities' existed, and could be won by properly organized systematic work carried out on the unionistic principle 'purified by the elimination of that detestable selfishness which ruins everything both in Church and State', both of which needed 'renewing'.¹⁸⁰ The church should work for 'the welfare of humanity', which was 'the glory of the Deity'. Trade unions should be 'characterized by the existence of the utmost confidence between all parties', and the good in everyone should be developed.¹⁸¹ Work should be provided on the goldfields, mining officials providing prospectors with advice.¹⁸² The 'honest worker' should be provided with basic equipment. He described the life of a prospector, based on his own austere experiences:

It is laborious work, but it is pleasant work, and it is full of promise, and therefore of hope. The men, too, are free from the temptations of the city: they are healthy, and they enjoy their food, which even with the prospecting dish, and pick and a shovel they can easily earn. It does not cost much to live in the bush. I myself have lived, when out on the gold fields, on 6/4 per week, and lived well, I may almost say luxuriously, even if I had only two meals a day – which are really quite sufficient. These men can live on 4/- or 5/- a week. They cannot fail to secure more than the value of gold, even with the most primitive appliances; so that those who are backing them run very little risk of losses – and they may come upon a rich patch and make considerable profits.¹⁸³

After explaining how to organise prospecting parties, he stated that in some parts of the country he had seen 'good money' made by sluicing (which he explained, including its costs).¹⁸⁴ He suggested that 'a union' consisting of 20 men and women be formed in Sydney, each paying 10s towards

¹⁷⁹ Campbell, *Gold, and How to Get It*, p. 18.

¹⁸⁰ Campbell, *Gold, and How to Get It*, p. 18.

¹⁸¹ Campbell, *Gold, and How to Get It*, p. 19.

¹⁸² Campbell, *Gold, and How to Get It*, p. 20.

¹⁸³ Campbell, *Gold, and How to Get It*, p. 21.

¹⁸⁴ Campbell, *Gold, and How to Get It*, pp. 21-23.

outfitting the prospecting party and 2s a week towards expenses, with five prospectors providing the labour. The Mining Department would give them 'passes' to work under an experienced leader in any part of the 92,000 square miles of auriferous ground. He outlined in detail how they would work and divide the profits.¹⁸⁵

The lecture concluded the lecture by claiming that, with 'even a little enterprise and energy' by his audience, he had provided one solution to unemployment. 'If I can be of any assistance to any of you, that assistance will be freely given; and I wish you every success in your undertaking and I thank you for the hearty reception and patient hearing you have accorded me to-night. (Great Applause.)'¹⁸⁶

A postscript added that it had been suggested that 4s or 5s per man per week for rations was too little, and agreed it could be adjusted. He agreed with the suggestion that no-liability prospecting companies be formed with, perhaps, 100 shareholders subscribing 2s or 5s each week to pay for 20 to 25 prospectors. As this was 'merely an enlargement' of his scheme 'by practical men', he hoped it would be taken up.

It has been proposed that I give another lecture at an early date, and after the lecture discuss the matter with all who are interested in the movement. I need hardly say that I shall only be too happy to lecture as many times as may be thought desirable, to help found the movement in every possible way.¹⁸⁷

An appendix added to the second addition reported that after his lecture he visited 'various localities' where he expected 'profitable work' to be possible, including Back Creek at Rockley. On returning to Sydney, he saw the Minister of Mines, who reserved 20 acres there for prospecting.¹⁸⁸ He then repeated his lecture in the School of Arts on 31 January 1895, not failing to mention that it had been presided over by a Member of the Legislative Assembly. 'The outcome of this Lecture was a crowded and most enthusiastic meeting held in the lecture hall of the School of Arts a fortnight later', which appointed a committee that formed the New South Wales Co-operative and Mining Association. He gave details of its prospectus: a no-liability company, members either paying £2 10s and

¹⁸⁵ Campbell, *Gold, and How to Get It*, pp. 23-24.

¹⁸⁶ Campbell, *Gold, and How to Get It*, pp. 24-25.

¹⁸⁷ Campbell, *Gold, and How to Get It*, p. 25.

¹⁸⁸ Campbell, *Gold, and How to Get It*, pp. 25-26.

obtaining paid up shares or paying 5s per month or 1s per week until reaching that amount. Each 'Industrial Member' received food, tools, and appliances, all the rights and privileges of a shareholder after working for 50 weeks, and a share in all profits. If returns were good, dividends of not more than ten per cent every six months would be paid.¹⁸⁹

As 60 shares were sold immediately, work started on a small scale. Because drought prevented work at Back Creek, 18 men were sent to work at Newbridge beside a permanent stream. 'Most of the men worked well, though some got discontented and left'. As a 'fair trial' produced 'only a small quantity of gold', they went to Back Creek and prepared dams and a water race in anticipation of rain. He expected they would find 'considerable quantities of gold' by sluicing, which could provide work for hundreds. He 'earnestly' hoped that the public would 'assist this philanthropic undertaking by donations or by taking shares'. A social had been organized by 'the good ladies of Randwick', where his school was situated, to assist the camp. 'This will realise a considerable sum of money', he anticipated; he hoped other suburbs would do likewise.¹⁹⁰

As Campbell never mentioned this association in any of his later lectures, newspaper articles, and pamphlets, it must be assumed to have been a failure.

CAMPBELL'S INSPECTION OF HAURAKI MINES IN 1896

In 1893 Campbell had 'no hesitation in saying that at a cost of £1000 a similar plant' to that at Cangai could be erected 'on any mine' in New Zealand, 'and that however refractory the ore, fully 90 per cent of the assay value will be won'.¹⁹¹ Three years later he told the Auckland press that he had 'been through New Zealand on several occasions'.¹⁹² He did not indicate the number of times, but after visiting in 1880 he 'gave a most eulogistic account of the Hot Lake District', meaning Rotorua, in a Sydney lecture.¹⁹³ He later claimed to have done 'original work', unspecified, in New

¹⁸⁹ Campbell, *Gold, and How to Get It*, pp. 26-27.

¹⁹⁰ Campbell, *Gold, and How to Get It*, p. 27.

¹⁹¹ *Australian Mining Standard*, n.d., reprinted in *Auckland Weekly News*, 3 June 1893, p. 21.

¹⁹² *Auckland Star*, 28 September 1896, p. 4.

¹⁹³ *Auckland Star*, 8 September 1880, p. 2; see also *New Zealand Graphic*, 11 July 1896, p. 11.

Zealand.¹⁹⁴ In Auckland in September 1896, he told an Auckland audience about his 1880 visit ‘as a student’.

In a series of papers he had written on his visit, he said with regard to the mineral wealth of the country that although it was but little developed yet sufficient had been done to show that New Zealand had in her minerals as rich, if not a richer, asset than any equal area in any part of the world. His more recent visits and investigations had not had the effect of making his change his opinions.¹⁹⁵

This ‘series of papers’ has not been traced, and do not appear to have been published.¹⁹⁶

Campbell first visited Te Aroha in June 1896, on the invitation of John Watson Walker, a leading mine manager,¹⁹⁷ to investigate the local ores.¹⁹⁸ Walker was interested in acquiring large areas for development,¹⁹⁹ but was aware of the difficulties of treatment. Upon arrival in Auckland, Campbell declared that his short visit was ‘for the purpose of examining some mining properties, and considering the treatment of some of the refractory ores’.²⁰⁰ Although expected to visit Thames, he went straight to Te Aroha.²⁰¹ With Walker, he took three samples and sent them to the Thames School of Mines for assay. The unpublished results were not encouraging: the first had a trace of gold, of six grains, valued at 1s; the second had three grains, value 6d; and the third had 15 grains, value 5s 7d.²⁰² Campbell was not discouraged, and would not be discouraged, at least not publicly, during

¹⁹⁴ Campbell, *Autobiographical Sketch*, [p. 7].

¹⁹⁵ *Auckland Star*, 28 September 1896, p. 4.

¹⁹⁶ See list of his publications in Branagan, p. 35.

¹⁹⁷ See paper on his life.

¹⁹⁸ Te Aroha Correspondent, *New Zealand Herald*, 2 July 1896, p. 6; *Te Aroha News*, 26 May 1898, p. 2.

¹⁹⁹ *New Zealand Mines Record*, 16 October 1899, p. 119; *Thames Advertiser*, 24 October 1899, p. 2; Te Aroha Warden’s Court, Mining Applications 1901, 10-12/1901, BBAV 11582/4b, ANZ-A.

²⁰⁰ *New Zealand Herald*, 24 June 1896, p. 6; *New Zealand Graphic*, 4 July 1896, p. 17.

²⁰¹ *Thames Advertiser*, 24 June 1896, p. 2, 2 July 1896, p. 2.

²⁰² Thames School of Mines, Assay Book 1895-1897, entry for 3 July 1896, School of Mines Archives, Thames.

most of his time in Te Aroha. Neither was Walker at first, in that year acquiring large areas adjoining the Tui mines.²⁰³

After spending some days inspecting the mines, Campbell gave his lecture, 'Gold and How to Get It'. There was 'a large attendance, the bulk of the audience being interested in mining'.²⁰⁴ Campbell felt 'somewhat at a disadvantage through the absence of the limelight views, with which he had hoped to illustrate the lecture, and make it far more interesting to his hearers'. He summarized the geology of the Earth and how gold had been deposited on land and in the sea, and praised his own process, claiming that for £1,500 he could erect a plant to treat 20 tons of ore per day. The district contained 'immense ranges containing innumerable reefs, representing enormous wealth, very many millions of pounds, which only requires the cheapest and best methods of gold-extraction to place us in a highly prosperous and flourishing condition'. He could 'safely' predict that 'in less than five years the mines will be effectually worked for the saving of the precious metals. (Loud applause)'.²⁰⁵ And why should they not applaud, when he was promising prosperity? He 'congratulated Te Aroha on its splendid prospects. From what he had seen of the surrounding hills and from the nature of their formation he had no hesitation in saying that the quantity of gold to be obtained therefrom was considerable'. He passed ore specimens around the audience, which noted that 'several pieces resembled the class of ore in the Tui property'.²⁰⁶ A Te Aroha correspondent wrote that, as Campbell's process was suitable for Tui ore, it was 'exciting great interest here'.²⁰⁷ Campbell then 'paid Rotorua a hurried visit, and left again immediately' after collecting 'data for lecturing purposes' from Tarawera. He intended reporting on various Waihi mining properties.²⁰⁸

Before returning to Sydney, he was interviewed by an Auckland journalist, 'to whom he expressed himself ready to give fullest information, his desire being that people should experiment for themselves'. He was 'greatly impressed' with Hauraki's mining prospects, anticipating, 'in the

²⁰³ Te Aroha Warden's Court, Mining Applications 1896, 6, 7, 17, 25/1896, BBAV 11289/14a, ANZ-A; Te Aroha Correspondent, *New Zealand Herald*, 10 July 1896, Supplement, p. 1.

²⁰⁴ Te Aroha Correspondent, *New Zealand Herald*, 2 July 1896, p. 6.

²⁰⁵ *Ohinemuri Gazette*, 4 July 1896, p. 5.

²⁰⁶ Te Aroha Correspondent, *New Zealand Herald*, 2 July 1896, p. 6.

²⁰⁷ Te Aroha Correspondent, *Auckland Weekly News*, 11 July 1896, p. 30.

²⁰⁸ *New Zealand Graphic*, 11 July 1896, p. 51.

near future, a period of activity and prosperity such as never before has been experienced'. At Te Aroha, he had 'carefully inspected the Admiral Fairfax, Lord Nelson, and Premier Extended. Of these, there was only one conclusion - that they were very good'. (Others who explored these claims found them disappointing: nothing of significance was ever found.) In particular, he had been 'very much impressed' with the Champion, the Plutus, and the New Zealand Exploration Company's property.²⁰⁹ Although unable to visit Waihi or Karangahake, just passing through Ohinemuri on his way to Thames was enough to convince him 'that payable reefs must exist in all that country'. At Thames, prospects were 'highly promising', and he recommended working the deep levels and the low-grade reefs. 'You have immense reefs in New Zealand, and you must do things on a corresponding scale. Small companies will retard progress, because they are unequal to the task. Strong companies are bound to succeed'. Asked about investment, he considered the region to be

a grand field for English capitalist, but in nearly every instance the ore will have to be treated in order to save the gold. I have approached the subject of the saving of gold from refractory ores with an unbiased mind. A true scientist cannot be a narrow-minded man, and I welcome every new process that comes before the public, as I have but one desire; that is, to see the mineral resources of the colonies developed. Perhaps I shall hardly be credited with such disinterestedness, but such is the fact. And though I have been working for 15 years, in nearly every instance I have given my service gratuitously.²¹⁰

He had created a 'free milling ore' from ores similar to those at Tui, and the base metals saved as by-products would 'often pay the cost of the whole treatment'. He had 'no hesitation in saying that all the ores' he had seen 'could be treated at a cost of from 3s to 5s per ton', and was willing to examine ore sent to him 'or give any advice in his power'.²¹¹ (His advice always being, of course, that his process should be adopted.)

Campbell returned to New Zealand in September on a 'visit of inspection to our goldfields en route to London where he will assist in giving

²⁰⁹ See papers on the Tui mines and on the New Zealand Exploration Company.

²¹⁰ *Auckland Weekly News*, 25 July 1896, p. 29.

²¹¹ *Auckland Weekly News*, 25 July 1896, p. 29.

them prominence both among the members of the learned societies to which he belongs and generally'.²¹²

He had been very favourably impressed with the Te Aroha-Waiorongomai districts on his former visit in July last, and that impression was fully confirmed during his recent inspection of a large number of claims. To quote his own words: "After plodding over the hills and carefully observing the various rock formations, and the general character of the country, I can safely say there is a great future before the district. The successful development of these fields will require the aid of English capital, as in nearly every case the ores will require special treatment.... I can honestly say that in all my travels in the district I have not seen any ores that could not be treated by the 'hyperphoric process'. I have made up my mind during my stay in England to call in the assistance of English capitalists in order to erect a complete plant in connection with certain claims in your district. I do not intend to let the matter drop, but I will further the advancement of your goldfields as far as lies in my power, for I am convinced that with systematic development on a large scale millions of money could be won from the Te Aroha-Waiorongomai mines in the near future."²¹³

Just before leaving for England, he lectured in Auckland on 'Your Goldfields and their Bright Future' to a large audience.²¹⁴ Attendance was encouraged by enthusiastic newspaper publicity:

What are the prospects of our goldfields? is a question frequently asked by mining and commercial people generally. Opinions differ widely, but the views of such an eminent geologist as the Rev. Joseph Campbell should at this particular time be received with the greatest attention. On Tuesday evening Mr Campbell gives his promised limelight entertainment, and from general indications the mining fraternity will be present in large numbers. Ladies are especially invited.²¹⁵

Limelight views 22 feet in diameter were promised, the mayor would introduce him, 'and several leading citizens and representatives of English and local companies will accompany His Worship to the platform. A most

²¹² *Auckland Weekly News*, 19 September 1896, p. 10.

²¹³ *Auckland Star*, 28 September 1896, p. 2.

²¹⁴ *Auckland Star*, 29 September 1896, p. 4.

²¹⁵ *Auckland Star*, 26 September 1896, p. 4.

enjoyable as well as interesting evening should be spent as Mr Campbell has an excellent reputation as a popular platform orator'.²¹⁶

The lecture, 'well illustrated by a series of limelight views', was 'listened to with the closest attention'. Campbell stated there was vast wealth locked up in Hauraki and expressed his 'earnest desire to bring before the English public the great Hauraki fields, so as to obtain some of the money now lying idle'. He made the startling announcement that the nearest gold-bearing area to Auckland was Rangitoto Island: samples he had taken in July contained 2dwt of gold to the ton, which was not payable with current processes. He explained the geology of the Hauraki Peninsula and how the gold had been deposited. The first field discussed was Waiorongomai with its reef outcropping 300 feet:

When he told them at Home that there were reefs of this size carrying gold they would be greatly surprised. The side reefs running into this tremendous body of stone in places carried very rich gold. He had been over the New Zealand Exploration Company's property there, and had no hesitation in saying that millions of pounds worth of gold would be taken from it. One assay he had made from a sample of stone from here gave a return of gold worth £1,050 to the ton.

(He failed to indicate that this sample was highly atypical.) The large Tui reefs were refractory, 'but he did not think there were any gold-bearing ores in New Zealand impossible of profitable treatment'. At Cangai 'he had carried on a series of experiments, and by calcining and with water gas he had obtained 1 3/4oz per ton from ore which previously only yielded 10dwt. This ore was much more refractory than any he had met in New Zealand'. After describing his process at length, he stated that the furnace used 'had been greatly improved, and he hoped to erect furnaces of this description at Te Aroha, by the aid of his friends in England, capable of treating 100 tons a week'. Concerning Thames, he anticipated (wrongly) that sinking to lower levels and driving seaward 'would prove highly remunerative'. He praised Karangahake and Waihi, and expected much from the Ohui mines. Coromandel also was 'magnificent' and a large output was forecast. Puhipuhi would produce much more than people believed, another prophecy doomed to be proved false very quickly.

²¹⁶ *Auckland Star*, 28 September 1896, p. 4.

In concluding, he said he had been most painstaking in his observations, and his opinion of the fields could be summed up in the one word “excellent.” The goldfields had a bright future before them, and the time would soon come when the little insignificant towns of the districts would develop into big cities.²¹⁷

His optimism was what his audience wanted to hear. The *Auckland Star* found it ‘very pleasant to find that our sanguine anticipations of the future in store for the Auckland goldfields’ were shared by ‘disinterested judges’. If Campbell’s process did indeed work, ‘one of the greatest obstacles in the way of the development of much of our auriferous country’ had been removed.²¹⁸

PUBLICIZING HAURAKI MINES (AND HIMSELF) ABROAD

Campbell travelled to London by way of the United States, where he visited mines at Cripple Creek, Colorado, and believed its ore was similar to that at Te Aroha, encouraging his belief that a plant there would be justified.²¹⁹ Reporting his arrival in England, a London correspondent described him as ‘so well known as an enthusiast in geology, mineralogy, and mining matters generally’. He was to give a series of lectures on the minerals of New Zealand, of which he spoke ‘in terms of enthusiastic laudation’.²²⁰

His paper, ‘The Gold-Fields of the Hauraki Peninsula, New Zealand’, given to the North of England Institute of Mining and Mechanical Engineers in December, was published in the *Transactions of the Institute of Mining Engineers* and then as a pamphlet.²²¹ He had just been elected an associate member of the institute as well as a member of the Society of Chemical Industry.²²² Campbell expressed surprise ‘that the mineral wealth

²¹⁷ *Auckland Star*, 29 September 1896, p. 4.

²¹⁸ Editorial, *Auckland Star*, 30 September 1896, p. 4.

²¹⁹ *Auckland Weekly News*, 6 July 1900, p. 40.

²²⁰ London Correspondent, *Auckland Weekly News*, 9 January 1897, p. 39.

²²¹ Joseph Campbell, ‘The Gold-Fields of the Hauraki Peninsula, New Zealand’, *Transactions of the Institute of Mining Engineers*, vol. 12 (1896), pp. 462-487 [including discussion]; Joseph Campbell, *The Gold-Fields of the Hauraki Peninsula, New Zealand: A Paper read before the North of England Institute of Mining and Mechanical Engineers ... December 12th, 1896* (Newcastle-upon Tyne, 1896).

²²² Campbell, *Autobiographical Sketch*, [p. 7].

with which the country literally teems should have been so long allowed to remain undeveloped'. Having 'constantly studied' the geology of Australia and New Zealand for the past 16 years, his opinions were 'the result of much thought, numerous experiments, and many a weary journey across some of the roughest parts of those great countries'. He explained the geology of New Zealand and the chemical reactions that formed Hauraki's auriferous reefs. After describing Te Aroha's vegetation, the chemical composition of its hot springs, and the volcanic district of the North Island, he summarized the difficulties of treating Waiorongomai ore. The 'unfortunate and ill-advised experiment' of erecting expensive plants before proving the process would succeed had kept 'back for years one of the richest gold-fields in New Zealand'. The ore in the New Zealand Exploration Company's ground was 'exceedingly rich, and one sample assayed by the writer gave a return of £1,050 per ton';²²³ once again he failed to indicate this was unique and not remotely typical.

In briefly summarizing of Karangahake and Waihi mining, he noted, correctly, that reefs would not be found in most of the latter's claims and that these had been taken up 'without any other reason than that capital may be secured to reward the original prospectors'.²²⁴ Thames also had encouraging prospects, and at Ohui and Coromandel the ore was ideally suited to his process.²²⁵ Coromandel had 'a prosperous future before it', and as for the 'very large area of auriferous country' on the peninsula yet to be explored, he had 'not the slightest hesitation in predicting' that 'reefs as valuable as any' already found would be discovered. He 'would very much like to see parties under competent engineers exploring these hitherto untrodden areas, for such explorations 'in the near future would meet with an abundant reward'.²²⁶ (He had not explored these allegedly unprospected areas, and did not justify this prediction.)

In conclusion, he claimed that the base metals contained in refractory ores meant the cyanide process would fail 'absolutely'.²²⁷ After mentioning two proposed methods of treating them, without assessing their effectiveness, he proclaimed that, after 'some years of very careful study to the treatment of gold-ores', he had invented a process which extracted '95

²²³ Campbell, 'Gold-Fields of the Hauraki Peninsula', pp. 473-474.

²²⁴ Campbell, 'Gold-Fields of the Hauraki Peninsula', pp. 474-475.

²²⁵ Campbell, 'Gold Fields of the Hauraki Peninsula', pp. 476-477.

²²⁶ Campbell, 'Gold-Fields of the Hauraki Peninsula', pp. 478-479.

²²⁷ Campbell, 'Gold-Fields of the Hauraki Peninsula', p. 479.

per cent of the gold-assay value of any ore'. (Lockwood's name was not mentioned, and would not be mentioned by Campbell after September 1896; from then on he always referred to the method he had modified as being his alone.) He explained the process only very briefly, because he planned to deliver a paper on it (this lecture that did not take place). For small mines, he claimed the cost of treatment would be from 1s to 5s per ton, and with a large plant 'the total cost of treating and amalgamating would not exceed 4s per ton'.²²⁸

As he admitted when concluding, he had presented 'a somewhat fragmentary paper'.²²⁹ Much later he stated he was awarded the institute's 'annual prize' for it,²³⁰ but the responses (some in the form of written communications) published in the *Transactions* make this claim questionable. The first man briefly commented that much of his paper contained 'purely speculative ideas' which had 'not the slightest value'.²³¹ S. Herbert Cox, a geologist then resident in London who had made the first report on the Te Aroha gold finds,²³² disagreed in detail with his explanation of the geology and his statement that the peninsula's goldfields would be greater than all others. 'The few remarks that he made upon his new process of treatment did not include sufficient details to allow of one's forming any opinion regarding its efficiency'.²³³ Henry Cadell, vice-president of the Mining Institute of Scotland, who had delivered a paper on Hauraki mines in the previous year after investigating mining there as well as in Australia,²³⁴ was more direct:

He thought Mr Campbell's paper contained a good deal of extraneous matter of no great importance in connexion with the subject, and that Mr Campbell might well have given descriptions of several of the mines that he (Mr Cadell) had omitted from his

²²⁸ Campbell, 'Gold-Fields of the Hauraki Peninsula', p. 481.

²²⁹ Campbell, 'Gold-Fields of the Hauraki Peninsula', p. 481.

²³⁰ *Cyclopedia of New Zealand*, vol. 3, p. 195; Campbell, *Autobiographical Sketch*, [p. 7].

²³¹ Thos. J. Bewick, in Campbell, 'Gold-Fields of the Hauraki Peninsula', p. 482.

²³² S. Herbert Cox, 'On Certain Points Connected with the Geology of the Auckland District' (30 June 1881), in *Reports of Geological Explorations During 1881* (Wellington, 1882), pp. 96-97.

²³³ S. Herbert Cox, in Campbell, 'Gold-Fields of the Hauraki Peninsula', pp. 482-484.

²³⁴ Henry M. Cadell, *Gold-Mining in the Hauraki District, New Zealand: A Paper Read before the Mining Institute of Scotland, 7 December 1895* (London, 1896); *New Zealand Herald*, 27 January 1896, p. 6.

paper on gold-mining in the Hauraki district, instead of traversing the whole map of Australia and New Zealand, and going into elaborate chemical disquisitions on the origin of reefs in general, but of no special interest in connexion with those of the Hauraki gold-field.

He complained that so much time had been spent dealing with Te Aroha's flora and the diseases cured by the hot springs there and at Rotorua that Campbell provided only a few lines on the reefs, 'which, from a mining standpoint, were the most interesting features'. Campbell had not provided the latest information about the new auriferous localities opened up, 'which he could easily enough have obtained. The only part of the paper that appeared to have any really new matter in it was the last paragraph', dealing with his process, but as this was to be explained in a future paper Campbell 'need not now have broached this matter at all, as it apparently had no special relation to the Hauraki gold-field'.²³⁵ George Binns, formerly a mining inspector in the South Island,²³⁶ agreed that Campbell's explanation of the geology differed from other geologists' understanding, and considered that he should have dealt with the problem of water when testing lodes at low levels. ²³⁷ Professor Henry Louis, author of *A Handbook of Gold Milling*, saw similarities between the geology of New Zealand and Colorado and California, but did not agree with Campbell's explanation of the formation of the lodes. Campbell's process was 'very old', as proved by a report he cited from 1672, 'apart from using the current of water-gas before amalgamating'. He considered there were 'other reasons for believing that heating alone might accomplish a great deal' of what Campbell argued was produced by his process.²³⁸

In response, Campbell ignored almost all the criticisms, apart from admitting he was uncertain about the formation of reefs and agreeing that some of the new methods were old ones 'resuscitated and improved'; he omitted to respond to the suggestion that his was also.

He took a broad and general view of these things, and there was room for fifty processes if they could only bring them to perfection. Regarding the application of simple heat, they all

²³⁵ Henry M. Cadell, in Campbell, 'Gold-Fields of the Hauraki Peninsula', p. 484.

²³⁶ See *Auckland Weekly News*, 17 May 1890, p. 15.

²³⁷ George J. Binns, in Campbell, 'Gold-Fields of the Hauraki Peninsula', pp. 484-486.

²³⁸ Henry Louis, in Campbell, 'Gold-Fields of the Hauraki Peninsula', p. 486.

knew that metallurgists could do a good deal with that, but he had so carefully considered and tried ore-treating in ordinary furnaces without the admission of any reducing-agents that he felt convinced good results could not be accomplished.

Only water gas removed all material that prevented the amalgamation of gold with mercury. ‘He was a hard-working student, not in the least dogmatical, and he was only too glad to get any assistance from anybody, even from the very humblest miner with whom he came in contact’.²³⁹

Campbell sent a further reply to the next meeting,²⁴⁰ describing Cox’s views as ‘very interesting, and deserving of careful attention’. He ‘could only reply that authorities differed; but if further examination proved that he was wrong in any of the particulars’, he would ‘readily admit his error’. He claimed his statements ‘in the main’ agreed with those of Professor Frederick Wollaston Hutton,²⁴¹ of Canterbury University College.²⁴²

In reference to Mr Cadell’s remarks, he would like to mention that when he began to write his paper on shipboard he intended entering very fully into the characteristics of the whole field, but on his arrival in London he was unwillingly compelled to cut it very short and leave out many matters of importance. What appeared at first sight as extraneous matter was not really so, but had a distinct and important bearing on the Hauraki field, e.g., the “elaborate chemical disquisitions.” The subject of the treatment of refractory ores – without a reference to which any paper on the Hauraki gold-fields would be very incomplete – could not be dealt with intelligently unless the question of the origin of the component parts of those ores was scientifically discussed.

After responding to Binns’ request for details of alluvial deposits, Campbell wrote that he was shortly returning

²³⁹ Joseph Campbell, reply to discussion, in Campbell, ‘Gold-Fields of the Hauraki Peninsula’, p. 487.

²⁴⁰ Campbell, ‘Gold-Fields of the Hauraki Peninsula’, p. 487, note.

²⁴¹ See paper on the Waitoa Find.

²⁴² For Hutton’s views, see F.W. Hutton, ‘On the Rocks of the Hauraki Gold-Fields’, *Report of the First Meeting of the Australasian Association for the Advancement of Science, held at Sydney, New South Wales, in August and September, 1888* (Sydney, 1889), pp. 245-274.

to continue his investigations into geology generally, and especially that of the Hauraki gold-field, which he regarded as being destined to occupy a foremost position in the world's gold-fields. He hoped at some time that he might be permitted to enlarge upon those matters which want of time prevented his dealing with in his paper in such a manner as he wished and as their importance deserved.²⁴³

That opportunity did not come.

In January 1897 Campbell gave a paper in the Newcastle Athenaeum praising various Te Aroha mines.²⁴⁴ In subsequent lectures in Manchester and other cities, he described the beauties and economic prospects of New Zealand.²⁴⁵ Whilst in England, he published an article in the *Mining Journal* of London on the treatment of tellurides, based on his experiences as well as his observations at Cripple Creek. Having read articles in this and other journals,

I feel that in what has been already written the difficulty can hardly be said to be overcome. As one who has given the question much thought for several years, both from a scientific and practical point of view, my opinion may perhaps be of some little value. The occurrence of tellurides in the Hauraki Peninsula has been known to me since the year 1890, and for some time I have been anxious to compare the formation of that interesting district with the renowned Cripple Creek district. On my return from London, via the United States, I took the opportunity, so long desired, of visiting this remarkable camp. The formations are almost identical, and my examination of Cripple Creek has strengthened me in my belief in the value and permanency of the goldfields of the Hauraki Peninsula.

He argued that although cyanidation and chlorination would save much of the gold, neither process could be recommended because 'in all of them great loss of precious metal results, to say nothing of the expense'. Unsurprisingly, he felt 'bound in the interests of science and practice to say' that his treatment would save 95 per cent of all tellurides or any other refractory ore 'at a cost of from 5s to 10s per ton, the actual cost chiefly

²⁴³ 'Discussion on the Rev. J. Campbell's Paper on "The Gold-Fields of the Hauraki Peninsula, New Zealand" ', *Transactions of the Institute of Mining Engineers*, vol. 13 (1897), p. 151.

²⁴⁴ *Ohinemuri Gazette*, 17 February 1897, p. 2.

²⁴⁵ *Ohinemuri Gazette*, 24 March 1897, p. 2.

depending on the accessibility of fuel and water supplies'. He claimed his process had 'received the approval of the most eminent scientists in England', and urged that before 'erecting any of the expensive plants' suggested to treat these ores, his be considered. 'As the patentee, and as an expert in the matter of ore treatment', he could 'safely say' that Cripple Creek and Western Australian ores could be treated for 10s per ton and New Zealand ores from 5s to 10s, in all cases 95 to 98 per cent of the assay value being saved.²⁴⁶ Reportedly during 1897 he published an article, 'Volcanic Zone of the Hauraki Goldfields', in the *Scottish Geological Magazine*, but this has not been traced.²⁴⁷

According to Campbell, his visit to England was 'pre-eminently successful'.²⁴⁸ In 1897, he told the Minister of Mines that he had demonstrated his process 'before the Royal Mint Authorities and received from them a highly satisfactory report', which he offered to show him.²⁴⁹ As this offer was not taken up, the report cannot be compared with Campbell's claims of its contents. In 1922, Campbell wrote that he 'had the honour of demonstrating in the laboratory of the Royal Mint, in the presence of Prof. Robert Austen, the Master of the Royal Mint, and Prof. of Chemistry in the Royal School of Mines, London, some of the wonderful chemical results connected with my investigations'. Campbell had a report written by Austen's chief assistant,²⁵⁰ but did not make it public. Campbell told the press that his process

was examined and tested in every possible way by the leading metallurgists of England – those connected with the Royal School of Mines, the Royal Mint for instance – and they recognised the importance of the discovery, accorded me their hearty interest and support, and expressed themselves as being more than satisfied with the result. A miniature plant was erected at the Royal Mint, and the process subjected to the severest test possible, ores of the most refractory nature from Australia and South Africa being treated, and with wonderful success.²⁵¹

²⁴⁶ *Mining Journal*, n.d., reprinted in *Thames Advertiser*, 28 July 1897, p. 3.

²⁴⁷ Trisha Kruyff (University of Waikato Library) to Philip Hart, 14 June 2005, email.

²⁴⁸ *Australian Mining Standard*, 15 July 1897, p. 2031.

²⁴⁹ Joseph Campbell to Minister of Mines, 20 July 1897, Mines Department, MD 1, 97/1488, ANZ-W.

²⁵⁰ Campbell, *Autobiographical Sketch*, [p. 8].

²⁵¹ *New Zealand Herald*, 26 April 1897, p. 5.

COMPANY FORMATION

According to Campbell,

His scientific papers and lectures did useful service in bringing the mineral resources of the colonies before the British public, and to some extent before the American experts. He lectured to the students and professors of Berkeley University, California, and had many consultations with American engineers concerning his process, and arranged with them for the use of the furnace in connection with his water-gas treatment.... He had the honor of being elected a Member of the Federated Institute of Mining Engineers of England, and a Member of the American Institute of Mining Engineers, also a Member of the Society of Chemical Industry.²⁵²

His lectures were designed to create interest in Te Aroha mines and assist to raise capital. As he told a Te Aroha banquet in May 1898, although a clergyman, 'he felt bound to do his level best to develop the mining industry by means of importation of foreign capital from Australia, India, and England'.²⁵³ He had reported favourably on the Merchant of Venice mine, taking assays giving from £5 to £12 per ton, and when in England had imparted this information to a syndicate interested in purchasing it. As usual, his assessment was over-enthusiastic, promising 'large returns at an early date'.²⁵⁴ A surveyor sent a new plan of the district's mines to him in London.²⁵⁵

On 1 January 1897, Campbell informed a London correspondent that he was 'forming a company to take over the Montezuma mine', close to Te Aroha township of the northwestern side of the mountain. 'The capital will be provided entirely by private subscriptions'.²⁵⁶ The company was a private syndicate of his friends.²⁵⁷ The *Te Aroha Times* expected 'this encouraging news' to stimulate 'legitimate mining operations in this district far exceeding anything that has been attempted in the past',²⁵⁸ a piece of

²⁵² *Australian Mining Standard*, 15 July 1897, p. 2031.

²⁵³ *Waikato Argus*, 26 May 1898, p. 4.

²⁵⁴ *New Zealand Mining Standard and Financial News*, 28 November 1896, p. 7.

²⁵⁵ *Waikato Argus*, 27 October 1896, p. 2.

²⁵⁶ London Correspondent, *Auckland Weekly News*, 20 February 1897, p. 30.

²⁵⁷ *Ohinemuri Gazette*, 17 February 1897, p. 2.

²⁵⁸ *Te Aroha Times*, n.d., reprinted in *Thames Advertiser*, 2 February 1897, p. 2.

hyperbole that overlooked the small amount of capital subscribed and his process having dealt only with small samples in laboratory conditions. A London correspondent described the registration of the Montezuma Company:

I may say that it is what may be called purely an “amateur” undertaking. The professional company-promoting element is being kept entirely out of it. It has not been underwritten, but has been taken up wholly by the Rev. Joseph Campbell and his friends and personal connections. The working capital is to be £10,000, all of which will be paid up at once. The position is, in fact, this: The owner of the Montezuma mine, which has been acquired by the new company, and which is situated at Te Aroha, virtually says: “I know this to be a very valuable property, but I have not enough capital to develop it, but you provide the capital and we will go halves.” That, I understand, is practically what has been agreed upon. A very attractive prospectus has been brought out, in which it is estimated that the property contains “fully two miles in length of gold-bearing reefs” and is “very rich in gold ore.” Mr Campbell has agreed to act as consulting geologist and managing director in New Zealand, and to direct all operations in matters in connection with the property until it is dividend paying. The directors express their conviction that Mr Campbell’s special knowledge and experience of the thermo-hyperphoric treatment will be of the utmost value and service to the company....

It is intended to hold in reserve 10,000 shares in the capital of the company after the present 20,000 are issued. This reserve will be used as required, or for developments and extensions as needed. It is intended if possible to create a parent company by the process of building up. The directors will take no fees except out of profits, and no commission or brokerage has been paid or will be paid as all the shares will be placed privately. The new enterprise seems to be favourably looked upon in the city.²⁵⁹

A Te Aroha correspondent praised the ‘business-like manner’ in which Campbell floated it without the aid of professional promoters. That he and ‘his personal connections and immediate friends’ held most of the shares was ‘a guarantee of good faith’.²⁶⁰ A local mining correspondent explained that he was successful in obtaining capital because,

²⁵⁹ London Correspondent, *Auckland Star*, n.d., reprinted in *Ohinemuri Gazette*, 24 March 1897, p. 2.

²⁶⁰ Te Aroha Correspondent, *Waikato Argus*, 25 March 1897, p.4.

in addition to his sanguine temperament, one recognizes in him the lineaments of the successful business man. His name, I am told, is as familiar east of Temple Bar [in London] as it is in Whitaker Street, Te Aroha, and it not infrequently figures in the “our London correspondent’s” mining and financial gossip as a man having the ear of a highly respectable section of the English public,²⁶¹

a reference to the respectable size of their bank balances. According to Campbell, the company was formed on condition that he was ‘managing director until everything should be in working order’, and as the laboratory to be established would give him ‘every facility’ for scientific work ‘he felt in duty bound to accept the appointment’.²⁶²

At the beginning of 1897, Campbell had acquired half the interests in the Montezuma Special Claim and the adjoining Mount Morgan Licensed Holding held by John Williams,²⁶³ a Te Aroha storekeeper.²⁶⁴ This ground extended from the boundary of the hot springs reserve to within eight chains of the Champion claim at Tui, containing ‘a large number of reefs ... varying in thickness from 3ft to 6ft, and generally of a highly-mineralised character’. A ‘moderate’ crosscut would provide 900ft of backs.²⁶⁵ On 20 January, an agreement was signed between Williams, the vendor, and Campbell, his attorney, with Thomas Ernest Baker of London, trustee for the company, whereby the latter acquired Williams’ mining properties for £10,662 10s. Of this, Williams received £662 10s in cash and the remainder in 10,000 shares, fully paid up. The sale, to be completed by 10 March, was of almost 70 acres plus a machine site of two and a half acres. The nominal capital was £30,000, in £1 shares.²⁶⁶ According to Campbell, immediately after registration the share-list was over-subscribed.²⁶⁷ Subscribers were required to pay a deposit of 5s per share.²⁶⁸ The first directors were Campbell, Sir Edward Hudson Hudson-Kinahan, of Fermoy, who gave his

²⁶¹ ‘Werahiko’, ‘Our Te Aroha Letter’, *New Zealand Mining Standard*, 24 April 1897, p. 3.

²⁶² *Australian Mining Standard*, 15 July 1897, p. 2031.

²⁶³ *Thames Advertiser*, 12 April 1897, p. 3.

²⁶⁴ See *Cyclopedia of New Zealand*, vol. 2, pp. 831-832; *Te Aroha News*, 17 October 1917, p. 2.

²⁶⁵ George Wilson to Minister of Mines, 29 June 1897, *AJHR*, 1897, C-3, p. 99.

²⁶⁶ Company Files, BT 31/7207/50975, The National Archives, Kew, London.

²⁶⁷ *New Zealand Mines Record*, 16 July 1898, p. 524.

²⁶⁸ Company Files, BT 31/7207/50975, The National Archives, Kew, London.

occupation as 'Baronet', Walter Culver James, a London doctor, Lieutenant-Colonel Percival Robert Innes, whose address was the Army and Navy Club, London, and whose occupation was 'K.C.B.', and Charles Campbell Ross, a Justice of the Peace who also lived in London. All were required to hold shares to a nominal value of £100: only Ross held this basic number: Innes had 595, James 745, Campbell 850, and Hudson-Kinahan 2,336.²⁶⁹

Campbell assured an Auckland journalist that people would invest in New Zealand mining when they received adequate information. 'In Manchester, as the result of one lecture, 3000 shares in the Montezuma Company were applied for, and in Dublin 2000. These shares were actually asked for'.²⁷⁰ They may have been asked for, but they were not taken up: 785 shares were subscribed in Manchester and 646 in Dublin.²⁷¹ Details of the original allotment were not recorded in the file lodged with the authorities, but by 28 December 1898 24,371 shares had been allotted to 99 shareholders. Of these, 33 lived in London, 51 in other parts of Great Britain, eight in Australia, four in India, and three in New Zealand. Apart from Campbell, the latter were Williams, with 3,300, and Dr William Henry Parkes of Auckland with 200. The largest occupational group was 'gentleman', to which should be added ten esquires, three men with no recorded occupation, a baronet, and a peer. The next largest group was 15 spinsters, who should be combined with eight married women, two widows, and a 'lady'. There were two clergymen in addition to Campbell and the Bishop of Sydney. The remainder were eight solicitors, two barristers, five soldiers, three each of engineers, doctors, and manufacturers, two cotton yarn agents, two merchants, a grocer, a brewer's chemist, a calico printer, a vestry clerk, a bookkeeper, a Justice of the Peace, a salesman, a bank manager, a traveller, and one 'miner', John Williams of Te Aroha, who was a storekeeper. One feature of the shareholdings was the number of families involved: 12, including the family of one of the directors, Hudson-Kinahan. Nine of these family groups comprised three or four members.²⁷²

According to the *New Zealand Mining Journal and Financial Guide*, 'one great advantage' the company possessed over other English ones was its small capital. Only 23,000 of the 30,000 shares had been issued, 'leaving

²⁶⁹ Company Files, BT 31/7207/50975, The National Archives, Kew, London; *British Australasian*, 11 February 1987, p. 279.

²⁷⁰ *Auckland Weekly News*, 17 July 1897, p. 29.

²⁷¹ Company Files, BT 31/7207/50975, The National Archives, Kew, London.

²⁷² Company Files, BT 31/7207/50975, The National Archives, Kew, London.

7000 for reserve capital'. The working capital was £20,000, and it expected the £18,000 cash already raised would 'complete the present works, and place the mine on a paying basis'.²⁷³

While in London, Campbell had erected an experimental plant at the Royal Mint 'to demonstrate to English capitalists the feasibility of his process'.²⁷⁴ As it was reportedly a complete success, 'a preliminary company' was formed with a capital of £25,000 to work it. In time he would

form a company of from £250,000 to £500,000, to extend operations to all the colonies, to Europe, Asia, etc. In America and Africa, too, companies will be formed, and already arrangements have been completed in America for the formation of a company of 500,000 dollars to form subsidiary companies in the United States and elsewhere.²⁷⁵

Shares were £10 each.²⁷⁶ 'Obadiah' was impressed that Campbell had proved 'conclusively' that he was 'able to do more than preach' by not only floating the Montezuma Company but also forming the Thermo-Hyperphoric Ore Treating Syndicate, which had registered his patent in England under its name.²⁷⁷ One New Zealander wrote that he had received a letter from England from someone who knew 'the people who have taken up' Campbell's patent. 'I find they have done great things, amongst others they have obtained a splendid report upon it from the Royal Mint, a thing everyone would say was impossible, but I saw the report myself'.²⁷⁸

(Lockwood, then mining at Kuaotunu,²⁷⁹ did not assist in erecting the Te Aroha plant, instead going to London in May at the syndicate's request to erect one 'on a working scale' to give the public a 'practical demonstration', using Indian, Canadian, Australian, and New Zealand ore,

²⁷³ *New Zealand Mining Journal and Financial Guide*, 1 February 1898, p. 385.

²⁷⁴ *Ohinemuri Gazette*, 10 March 1897, p. 2.

²⁷⁵ *New Zealand Herald*, 26 April 1897, p. 5.

²⁷⁶ *New Zealand Mining Journal and Financial Guide*, 1 May 1897, p. 230.

²⁷⁷ 'Obadiah', 'Shares and Mining', *Observer*, 20 March 1897, p. 9; *New Zealand Herald*, 16 March 1897, p. 6; *Auckland Weekly News*, 1 May 1897, p. 20; *Thames Advertiser*, 28 July 1897, p. 3; *New Zealand Mines Record*, 16 July 1898, p. 524.

²⁷⁸ 'Porcupine', 'Te Aroha Notes', *Waikato Argus*, 11 May 1897, p. 2; cited, with slight variations, in 'Twinkler', 'Te Aroha Notes', *Thames Advertiser*, 12 May 1897, p. 3.

²⁷⁹ Coromandel Warden's Court, Register of Kuaotunu Mining Applications 1897-1900, folios 8, 11, 58, ZAAAN 14041/1a, ANZ-A.

of 'the process which has given such a wonderful result at recent trials'.²⁸⁰ He never returned to New Zealand. In July 1898, when he described himself as a mining engineer, his patent was accepted for 'improvements in amalgamating apparatus'.²⁸¹ The following year, he became 'general manager of a large mine in Wales, adjoining the Pritchard-Morgan mine'.²⁸² In 1909, with M.R.A. Samuel of London, he sought two patents for 'treatment of ores'.²⁸³ In 1912, along with the Turbo-Amalgamator and Extraction Company, he obtained a patent for extracting metal from pulp.²⁸⁴

Lockwood recounted 'a dramatic story' in the Old Bailey in London in 1913 when another man was accused of libelling Godfrey Isaacs, managing director of the Marconi Company:

Mr A.A. Lockwood, formerly manager of the St David's Gold and Copper Mine, of which company Mr Godfrey Isaacs was Chairman, gave evidence that the first crushing of ore gave a yield of 15dwt of gold to the ton, but the second crushing yielded only 5dwt to the ton. He said that Mr Isaacs was much disappointed with the second crushing, and repeatedly urged him to give a certificate that the ore throughout the mine was worth 15dwt to the ton.

The witness was cross-examined by Mr F.E. Smith, K.C. "Have you ever been associated in a bogus venture in your life?" asked the counsel. "I have often been in a mine that didn't prove successful," was the reply.

Counsel: That is not the question. Have you ever been associated in a bogus venture? – Never.

Witness, continuing, said that when he gave the result of the second crushing Mr Godfrey Isaacs alleged that he (witness) had appropriated the gold.

Counsel: Since then relations between you and Mr Isaacs have been bad? – They have not been very friendly.

So all these years your recollections of that have been extremely unfriendly? – I can't say they have been friendly when a man accuses you of being a thief and threatens to prosecute you.

"You threatened to shoot him, didn't you?"

Witness laughed. "I think Mr Isaacs had been in a melodrama or had a nightmare when he said that." Then he added: "I remember I once knocked him down."

Mr Smith: Your violence stopped short of firearms?

²⁸⁰ Te Aroha Correspondent, *Waikato Argus*, 20 May 1897, p. 2; *Ohinemuri Gazette*, 22 May 1897, p. 5.

²⁸¹ *New Zealand Gazette*, 7 July 1898, p. 1124.

²⁸² *Ohinemuri Gazette*, 9 August 1899, p. 2.

²⁸³ *Progress*, 1 April 1909, p. 214.

²⁸⁴ *AJHR*, 1912, H-10, pp. 27, 35.

Witness: When I was a young man and lived in country places I should have loaded him with lead without the slightest hesitation.

The Judge: You would have shot him? I would. No man can say I ever robbed or injured a man in my life. But if a man called me a thief I would kill him as soon as look at him.

Counsel: That is the feeling you have? – That was the feeling I had when I was a younger man.

When did you cease to want to shoot a man who insults you? – Many years ago, when I became a married man and father of a family. – (Laughter).

When were you married? – In 1875 [correctly 1870].²⁸⁵

Since then you have abandoned what I may call a shooting method of argument? – I have been through conditions in New Zealand where I had shot –

The Judge (interposing): You had had enough of shooting? – I had to protect my family in those days.

Counsel: But you did knock Mr Godfrey Isaacs down?

Witness: When he grossly insulted me. I was when he wanted me to sign a paper stating that the general dirt of the mine was worth 15dwt to the ton.

When was that? – About January, 1899.

Was that before Mr Isaacs accused you of misappropriating the gold. – Yes.

In subsequent evidence, he was quizzed about why he had later dined with Isaacs (answer: ‘I wanted a little refreshment’) and was ‘unable to say why he had not stated in a letter to a director, in which he made numerous complaints, that Mr Isaacs had made a fraudulent proposal to him’. He denied his story was untrue, but ‘admitted that he had reported that the mine was a first-class property, and of a sound and permanent character, that that the report was a correct one’. Counsel stressed that, at a meeting of the Mining and Machinery Company in June 1901, Lockwood ‘(who made a number of complaints) said nothing of the proposal which he alleged Mr Isaacs had made to him’, and charged him with trumping up a lie ‘out of spite for the purpose of this case’. Denying this, Lockwood added that the mine would have been ‘a sound and permanent mining property’, as he had reported, if it ‘been worked in the way he suggested. Instead of that an expensive plant was put in and electric light installed throughout the mine’.²⁸⁶

In April 1918, when living at Forrest Hill, in Lewisham, Lockwood applied for a patent in New Zealand for ‘obtaining gold and silver from ores’.²⁸⁷ He would die there in November that year, aged 72.)²⁸⁸

²⁸⁵ Marriage Certificate of Alfred Andrew Lockwood, 5 December 1870, 1870/4959, BDM.

²⁸⁶ *Oamaru Mail*, 22 July 1913, p. 7.

²⁸⁷ *Dominion*, 20 April 1918, p. 9.

Despite the massive plans, what was formed was far more modest. After the syndicate, with Lockwood's assistance, erected a large ore-treating furnace in London by mid-1898, it invited companies to send parcels of from five to ten tons of refractory ore for free treatment.²⁸⁹ In August, it reported that the process had saved 84 per cent of Borneo ore, the highest amount ever saved.²⁹⁰ It continued to experiment, the chairman of directors, W. Cayley Alexander, informing Campbell that it had proved the process refined ore in readiness for a much briefer use of cyanide than normally required. The 'eminently satisfactory' results of trials from mines in New South Wales, New Caledonia, Eastern Asia, Borneo, and New Zealand were given: the latter being from the Maori Dream mine, not Te Aroha.²⁹¹

A branch office established in Auckland in April 1899 informed a committee attempting to erect a public battery at Coromandel that it would provide one in return for a guaranteed 20 per cent of the subscribed capital. It sought a government subsidy, was rebuffed,²⁹² and did not erect it. In November, Campbell received a cable from London 'saying that the preliminary work of organising a company' to work the process 'on a large scale' was completed, and he should return 'at once' to superintend the erection of the furnaces. However, he decided to carry on with his work at Te Aroha unless he received 'a very urgent request to go Home immediately'.²⁹³ The request was not repeated.

CONSTRUCTING THE PLANT

In March 1897 Campbell had announced he had ordered the machinery and expected to be treating ore by November. Yet again he claimed to have 'the most perfect furnace and ore-treating method in the world' and that he would recover 95 per cent of the assay value at a cost of 5s per ton.²⁹⁴ Upon returning to Auckland in late April, he declared his visit

²⁸⁸ Ancestry.co.uk.

²⁸⁹ *Ohinemuri Gazette*, 15 June 1898, p. 3; *New Zealand Mines Record*, 16 July 1898, p. 527.

²⁹⁰ *New Zealand Herald*, 25 August 1898, p. 6.

²⁹¹ *New Zealand Herald*, 1 November 1898, p. 6.

²⁹² Albert Burches (Agent, Thermo-Hyperphoric Ore Treating Co. Ltd., Auckland) to Minister of Mines, 28 April 1899, Mines Department, MD 1A, 8/50, Part 1, ANZ-W.

²⁹³ *Auckland Weekly News*, 17 November 1899, p. 13.

²⁹⁴ *Ohinemuri Gazette*, 17 March 1897, p. 3.

to England had been 'in every way successful'. Despite finding London 'in a very depressed state', so many people were interested in the treatment of Hauraki ore that a company had been formed 'on the distinct understanding' that its work 'would be carried through under my own personal supervision. On account of this stipulation I shall devote another year to the matter', during which he would personally supervise the erection of the plant. After going to Sydney he would return at the end of June to take up permanent residence. The plant, to be erected by the end of October for about £6,000, would 'be capable of putting through from 50 to 60 tons per day, but with a very small expenditure will be capable of putting through 100 tons'. He remained 'quite confident' that the process would save 95 per cent of 'any' Hauraki ore and 'quite convinced that the secret of treating telluride ore has been solved, and that the discovery will have a wonderful effect on mining in all parts of the world'. When in England,

I brought myself into touch with the leading metallurgical and other scientists and have secured their co-operation and cordial help. I am convinced that any rock from the Hauraki Peninsula can now be easily treated, and by securing the co-operation of the leading scientists of England and elsewhere I hope to help New Zealand mining in many ways.²⁹⁵

A machine site on the hillside adjacent to the township was granted in early May, and 'the machinery and appliances' would be erected 'without any delay' after Campbell's planned return on 1 July by 'skilled mechanics' under his supervision.²⁹⁶

Campbell's return to Te Aroha was delayed while he settled his affairs. 'The all-absorbing topic of conversation' there in July was his impending return, residents being informed that although 'very pressed with work' he had delivered a second lecture to the Melbourne Chamber of Commerce: 'Gold - Its Occurrence and Extraction in the Light of Modern Scientific Research'.²⁹⁷ Williams consulted with him upon his return to Auckland in mid-July,²⁹⁸ when he announced his decision to devote all his energies to the plant:

²⁹⁵ *New Zealand Herald*, 26 April 1897, p. 5.

²⁹⁶ 'Twinkler', 'Te Aroha Notes', *Thames Advertiser*, 17 May 1897, p. 3, 3 June 1897, p. 2.

²⁹⁷ 'Twinkler', 'Te Aroha Notes', *Thames Advertiser*, 10 July 1897, p. 3.

²⁹⁸ *Thames Advertiser*, 15 July 1897, p. 2.

He had closed the college in Sydney of which he was principal, and has resigned his parish in order that he might give his undivided attention to the important matter of the treatment of refractory ores and the investigation of the occurrence of gold - Mr Campbell believing that the more light thrown on this important subject the more assistance will be obtained in extracting gold from combinations

of processes. He would devote the next 12 months solely to treating ore, being 'desirous of disseminating information, and also of getting hints from practical men. I believe in the combination of practice with science, so that we may have practical and not theoretical scientists'. As the furnace was 'a most essential feature', he had 'left instructions that the latest information was to be obtained' before it was installed under the supervision of American engineers.

It has been said that a mistake has been made in the selection of Te Aroha as the scene of operations, and that I should have taken up a rich mine for the purpose of demonstrating the treatment. But so certain am I that the rich ores can be successfully treated that I considered it would be of more practical importance to prove that low grade ores could be successfully handled - ores running from £2 to £3 per ton - and as these ores abound in Te Aroha, and indeed in a large area of the Hauraki Peninsula, their successful treatment means the permanent opening up of a large area of auriferous country.

All his experiments in England had been most satisfactory, and 'the leading metallurgical chemists' he met in London and the United States

expressed their firm conviction that I was on the right track. The Royal Mint interested themselves in the matter, and latest advices from London state that the erection of the hyperphoric plant for exhibition at the exhibition of inventions of the Victorian era is well in hand. But I want to demonstrate by work when the plant at Te Aroha is in full swing, what the process can do, and I ask all scientific men to suspend their judgment until the plant is actually working, when they can judge the results.

He had been experimenting in his laboratory with tellurides and refractory ore from Western Australia, with reportedly good results, and was revising his *Simple Tests for Minerals*.²⁹⁹ He planned to spend a year at

²⁹⁹ *Auckland Weekly News*, 17 July 1897, p. 29.

Te Aroha, but was willing to carry on 'his important scientific work in connection of mining' in any Australasian colony as requested.³⁰⁰

In July, Campbell informed the Minister of Mines that he had 'undertaken a most important task in the Colony, that of treating in a payable manner' Hauraki's low-grade ores. Over the next 12 months he would erect and work his plant, treating from 80 to 100 tons a day. All the machinery came from England and the United States as he 'had to get the assistance of the best Engineers in Each Country to bring my process to perfection', and he asked that it be free of customs duty, a request the Customs Department had already declined, Campbell paying, 'under protest', £75. He had 'given up a most important position' in Sydney to 'do the great work and I claim the sympathy and support of those interested in the Country's welfare'. After thus magnifying the importance of being principal of a minor school, he again asked that no duty be charged and requested a refund of the £75.³⁰¹ He was informed that no blanket clearance could be granted, but that Customs might consider individual items, including the £75, if given full details.³⁰²

Campbell had created hopes that his process would, in the words of a *Thames Advertiser* editorial, extract gold 'from stone which has, so far, puzzled scientists of repute'. If it worked at Te Aroha, it would also work on Waiomu and Thames ore, and give 'the industry generally a tremendous impetus'. The editorial quoted Campbell's explanation in his brochure *The Goldfields of New Zealand* and repeated his claims to have made satisfactory tests. That the plant would 'do its work cheaply' it had 'no doubt', and if it operated 'as expected Te Aroha must become the centre of a large industry for all authorities tell us that its large auriferous, argentiferous, and cupriferous lodes are very rich. We shall be very pleased to see the plant's success'.³⁰³ A week later, it noted that Campbell 'evidently means business', being 'busily engaged' preparing for 'systematic development' of the mines using his process. 'Every precaution' was being taken to ensure success, and Campbell had 'implicit faith as to results'.³⁰⁴

³⁰⁰ *Australian Mining Standard*, 15 June 1897, p. 2031.

³⁰¹ Joseph Campbell to Minister of Mines, 20 July 1897, Mines Department, MD 1, 97/1488, ANZ-W.

³⁰² Under-Secretary, Mines Department, to Joseph Campbell, 17 September 1897, Mines Department, MD 1, 97/1488, ANZ-W.

³⁰³ Editorial, *Thames Advertiser*, 19 July 1897, p. 2.

³⁰⁴ *Thames Advertiser*, 26 July 1897, p. 2.

An August 1898 report by the London company experimenting with Campbell's patent concluded it was 'the essence of simplicity and efficacy'. It was 'so simple that three hands are sufficient to manage a 100-tons-a-week plant' and was 'very cheap, a plant of that size seldom exceeding £2500, according to locality required, and sometimes less'. The cost of treatment was 'very much below even the ordinary battery treatment'.³⁰⁵ These claims would be disproved at Te Aroha.

PUHIPUHI

Campbell had visited the mines at Puhipuhi, near Whangarei, in 1896, and, as always, was optimistic about a field that quickly faded in significance.³⁰⁶ George Wilson, mining inspector,³⁰⁷ sent to investigate the mines in 1889, had correctly reported that nine out of the ten reefs were worthless.³⁰⁸ At the beginning of February 1898, Campbell visited again, and employed two men to make tracks and other preparatory work. He intended to treat 100 tons of ore at his works, and mining resumed that month under his supervision.³⁰⁹ In a typical interview, Campbell stated that he had 'great faith in the future of the field', for it contained 'some of the best ore he has seen in New Zealand' and he was 'anxious to get out a trial parcel of ore as quickly as possible for treatment'. He was getting parcels from each of the Montezuma Company's three claims 'and those properties which prove payable will be worked vigorously', for this company was 'a very wealthy corporation'.³¹⁰ The following month Wilson noted that the Hampton Plains and Montezuma companies had any found anything payable.³¹¹ In May, Campbell applied for the Argyle claim under his own name.³¹² After the trial of this ore at his plant was reportedly successful,³¹³

³⁰⁵ *New Zealand Herald*, 1 November 1898, p. 6.

³⁰⁶ *Auckland Star*, 29 September 1896, p. 4.

³⁰⁷ See paper on his life.

³⁰⁸ *Te Aroha News*, 25 December 1889, p. 2; see also H.A. Gordon to Minister of Mines, 1 June 1890, *AJHR*, 1890, C-3, pp. 25-26.

³⁰⁹ *Ohinemuri Gazette*, 9 February 1898, p. 3; *Auckland Weekly News*, 19 February 1898, p. 30.

³¹⁰ *Northern Advocate*, 16 April 1898, p. 4.

³¹¹ George Wilson to Minister of Mines, 12 May 1899, *AJHR*, 1899, C-3, p. 33.

³¹² Whangarei Warden's Court, Register of Mining Applications 1897-1901, 11/1898, BADF 10405/1, ANZ-A; advertisement, *Northern Advocate*, 14 May 1898, p. 3.

he inspected the Hampton Plains Corporation's battery to see what alterations were required for it to use his process. He would explain what was needed to the corporation when in London.³¹⁴ In November, when the Hampton Downs Syndicate, a London company, purchased the mines and plant, it was reported that Campbell would be its metallurgist.³¹⁵ Nothing came of this field, and Campbell did not go to London.

PREPARING THE MINES, TRAMWAYS, AND PLANT

In September 1897, Campbell acquired the Waitara Special Claim at Tui from John Wallace, a miner,³¹⁶ 'for sundry good causes and considerations', which apparently did not include cash.³¹⁷ Also that month, he purchased the Grand Result Special Claim, Edendale Licensed Holding, and two water race licenses at Waiorongomai from Thomas McIndoe, a Te Aroha saddler,³¹⁸ for 10s, a price suggesting that McIndoe had become a shareholder in the company.³¹⁹ In February 1898, he had an option over ten or 12 claims,³²⁰ but nothing came of almost all of these. He was registered as owner of the Montezuma Extended Special Claim in March,³²¹ and in August, on behalf of a Calcutta syndicate, took up a three months' option to buy the mines and battery at Waiorongomai abandoned by Aroha Gold Mines, obtaining six month's protection whilst raising capital.³²² After 'a

³¹³ *New Zealand Mines Record*, 16 July 1898, p. 525.

³¹⁴ *Northern Advocate*, n.d., reprinted in *Thames Star*, 27 July 1898, p. 4.

³¹⁵ *New Zealand Herald*, 19 November 1898, p. 3.

³¹⁶ See Te Aroha Warden's Court, Register of Te Aroha Claims 1880-1888, folios 225, 282, 285, 304, 305, BBAV 11567/1a, ANZ-A; *Te Aroha News*, 9 March 1889, p. 2, 1 May 1889, p. 2, 11 May 1889, p. 2, 28 September 1895, p. 2, 12 October 1932, p. 5.

³¹⁷ Te Aroha Warden's Court, Letterbook 1883-1900, p. 450, BBAV 11534/1a; Mining Registrations 1897, Assignment dated 2 September 1897, BCDG 11288/1a, ANZ-A.

³¹⁸ See *Cyclopedia of New Zealand*, vol. 2, p. 831; *Te Aroha News*, 12 October 1942, p. 2.

³¹⁹ Te Aroha Warden's Court, Mining Registrations 1896-1903, Assignment dated 18 November 1897, BCDG 11288/1a, ANZ-A.

³²⁰ *Thames Advertiser*, 1 February 1898, p. 3.

³²¹ *AJHR*, 1898, C-3, p. 73.

³²² Memorandum of R.R. Hunt, 22 July 1897; Decision of Warden, 9 August 1898; R.R. Hunt to Under-Secretary, Mines Department, 16 August 1898; Warden to Under-Secretary, Mines Department, 19 August 1898, Mines Department, MD 1, 99/588, ANZ-

further careful examination', he stated it was 'one of the best in New Zealand', for the buck reef lived 'to a depth of certainly 2000ft' and 'treasure' would be found by extending the low level, though for present the property could be worked from the surface.³²³ If this Calcutta syndicate comprised the three people with shares in the Montezuma Company in December that year, their interest in the district was very modest: a French 'esquire' had 400 shares, an English 'gentleman' had the same, and a woman had four.³²⁴ Campbell stated that as the option was 'practically a purchase' he was about to work some of the mines, the assays being 'very satisfactory'.³²⁵ However, the syndicate did not purchase these mines in association with Campbell but with Edwin Henry Hardy³²⁶ and other local investors.³²⁷ Presumably the Montezuma Company had declined to provide the capital to enable Campbell to acquire these more valuable mines.

In January 1898, Campbell was reported to have 'recently' taken over the Merchant of Venice, and would personally supervise its working. He let a contract to drive 100 feet, believed to be sufficient to hit a shoot of ore that assayed at £27 14s 11d near the surface.³²⁸ This 'working option', with a working capital of £20,000, might lead to the formation of a separate company being formed with a capital of £100,000.³²⁹ It must be presumed that the reef did not live up to expectations, for the option expired in July without the Montezuma Company taking over the ground.³³⁰ In February he let a contract to put in a crosscut in the Silver King section of the Cadman, and took out ten tons of ore for testing at his plant.³³¹ By July, he had 'made a thorough personal examination of the Silver King lode' and had

W; *Thames Advertiser*, 8 August 1898, p. 3, 23 August 1898, p. 3; *New Zealand Herald*, 16 November 1898, p. 6.

³²³ *New Zealand Herald*, 16 November 1898, p. 6.

³²⁴ Company Files, BT 31/7207/50975, The National Archives, Kew, London.

³²⁵ *New Zealand Herald*, 25 August 1898, p. 6.

³²⁶ See paper on his life.

³²⁷ *Thames Advertiser*, 17 November 1898, p. 3.

³²⁸ *Ohinemuri Gazette*, 29 January 1898, p. 2.

³²⁹ *New Zealand Graphic*, 5 March 1898, p. 281.

³³⁰ Te Aroha Warden's Court, Register of Applications 1883-1900, 35-41/1898, BBAV 11505/1a, ANZ-A; *Ohinemuri Gazette*, 26 February 1898, p. 2; *Auckland Weekly News*, 26 February 1898, p. 19.

³³¹ *Te Aroha News*, 1 February 1898, p. 2; *Thames Advertiser*, 1 February 1898, p. 3.

assured the shareholders that their ore was worth £3 10s per ton.³³² By that month, the company had acquired four special claims and two licensed holdings between the township and Tui, totalling 319 acres, one special claim and one licensed holding at Waiorongomai comprising 127 acres, and two special claims at Puhipuhi, a total of 646 acres.³³³

The Montezuma Company at first relied on Campbell for information before Colonel Kerr-Innes, the chairman of directors, arrived from England in February 1898 to inspect its mines and those over which it had options. He returned to England in time to report to the annual general meeting in April.³³⁴ It is not known whether the colonel was competent to make informed judgments about mines or plant.

At the beginning of May, a local reporter wrote that the tramway to the terminus of the Tui aerial tramway was 'nearing completion, nearly all the bridges being finished, and the earthwork and sleeper-laying is nearly completed'. A 'short flying tram' connected the Plutus workings with the Tui hopper at the head of the aerial tramway. After 'a tedious climb of about a mile and a half' and 2,000 feet up the mountainside his party reached the Plutus, 'where we noticed an immense reef', from which they understood payable ore was being broken out and 'extensive preparations' had been made for 'the systematic development of this great reef'. A parcel of 50 tons was being brought from the Grand Result to test the value of the Waiorongomai reefs.³³⁵ According to information Campbell provided to the *New Zealand Mines Record* in July,

legitimate development operations have been continuously carried on, not merely of a superficial character in the shape of surface prospecting, but in genuine mining operations, which have been of so encouraging a nature as to induce the management to treat at the reduction-works at Te Aroha parcels of ore from reefs situated on each of these properties.³³⁶

³³² James Mills to Minister of Mines, 25 July 1898, Mines Department, MD 1A, 8/50, Part 1, ANZ-W.

³³³ *New Zealand Mines Record*, 16 July 1898, p. 524.

³³⁴ *Te Aroha News*, 12 February 1898, p. 2; *Thames Advertiser*, 16 February 1898, p. 3, 17 February 1898, p. 3.

³³⁵ *Te Aroha Times*, n.d., reprinted in *Thames Star*, 6 May 1898, p. 3.

³³⁶ *New Zealand Mines Record*, 16 July 1898, pp. 524-525.

Most mining had been in the Plutus because Campbell considered the refractory stone found on the surface was 'eminently metalliferous and valuable'. The reef had been 'opened up for a considerable distance', and by July was 'ready for active mining developments'. The company, having secured the right to use the old Tui aerial tramway, had taken several hundred tons down to be treated. The Ruakaka and Waitara mines had also received 'a considerable amount of attention' and large parcels from 'various payable refractory large lodes' awaited treatment. 'On the Montezuma itself a considerable expenditure of capital has taken place, but the management have *pro tem* suspended operations, as they have from other properties unlimited supplies of ore of a richer character'. At Waiorongomai, 'a number of men' employed on the Grand Result and Edendale had developed several reefs.³³⁷

None of these claims contained valuable ore, and there was little mining whilst the plant was being erected. Most of the work in the Montezuma and Mount Morgan mines had been done before Campbell took over.³³⁸ When George Wilson inspected in January 1898, work was 'being carried on in the Montezuma and five other properties', including the Waitara and Plutus, 'in which the lodes were being systematically opened up'. The drive in the No. 2 level of the Waterfall reef was in 250 feet but the stone was 'of poor quality'.³³⁹ A year later, he reported that the reefs had been 'proved by cross-cuts for some 10 or 12 chains, and levels put in along the lines of reef in preparation for stoping, and a fair quantity of ore' was available. The three reefs, varying in width from two and a half feet to six feet, consisted of 'mineralized quartz, encased in andesite country'.³⁴⁰

LABOUR RELATIONS

The most publicity mining in the Montezuma achieved under Campbell's control was when he provoked a strike in October 1897 because of the regulations he attempted to impose:

Miners to work 48 hours per week, from 8 a.m. till 12 noon, and from 12.30 p.m. to 5 p.m. ordinary, and on Saturday from 8 a.m.

³³⁷ *New Zealand Mines Record*, 16 July 1898, p. 525.

³³⁸ See details in *Thames Advertiser*, 12 April 1897, p. 3, 27 May 1897, p. 3.

³³⁹ George Wilson to Minister of Mines, 12 May 1898, *AJHR*, 1898, C-3, p. 74.

³⁴⁰ George Wilson to Minister of Mines, 12 May 1899, *AJHR*, 1899, C-3, p. 69.

to 11 a.m., and from 11.30 a.m. to 2 p.m.; smoking during working hours is prohibited, except for five minutes at 10 a.m. and 3 p.m., and no talking to be allowed.³⁴¹

In addition, ‘any employee found talking, or otherwise loitering in the company's time, will be subject to instant dismissal’.³⁴² There were other rules about how to report loose ground and to use explosives, but the ones quoted caused the miners, mostly members of the Thames Miners' Union, to refuse to obey them. According to the *Thames Advertiser*, which was amused by the fuss, ‘the President of the Union went up and interviewed the Rev. Joseph, and convinced him of the errors of his ways. Now we understand that peace again reigns in the mine’.³⁴³

Campbell's attitude to the wages question was revealed both in a sermon and a private conversation. In April 1898, he gave a sermon in St Mark's, Te Aroha, on a text from St Luke: ‘Be content with your wages’. This did not mean, he assured the congregation, that they must be content with the present condition of the people:

We were to do the best we could with the means at our disposal, and live within those means, but never to forget that we were to strive, by every fair and honourable method, to better our conditions. The trouble was, that so many neglected the necessity of being upright and honourable in all their efforts at advancement.³⁴⁴

What he was hinting at was made clear in a conversation with two visiting English Fabians, Sidney and Beatrice Webb, whom he met on a train to Rotorua on 12 August, as Beatrice recorded:

An agreeable cleric who had turned from preaching sermons to testing minerals for mining prospects talked with us ... He complained that the country needed cheap labour: “There is no room for men at 8/- a day, but plenty of occupation for men at 5/- a day; the worst of it was that directly the cheap labour got here, the men joined the union and asked 8/- like the rest.”³⁴⁵

³⁴¹ *Thames Advertiser*, 16 October 1897, p. 4.

³⁴² *Thames Advertiser*, 19 October 1897, p. 4.

³⁴³ *Thames Advertiser*, 19 October 1897, p. 4.

³⁴⁴ *Te Aroha News*, 19 April 1898, p. 2.

³⁴⁵ *The Webbs in New Zealand 1898*, ed. David Hamer (Wellington, 1974), p. 27.

Campbell in an 1894 sermon indicated that he was not against trade unions, for a properly organized system of work was needed. He recommended union principles 'purified by the elimination of that detestable selfishness which ruins everything both in Church and State'.³⁴⁶

One month before meeting the Webbs, Campbell had been sued for £148, the value of work done on the Plutus by Andrew Tait Walker Allan,³⁴⁷ who claimed Campbell had asked him to break down some quartz:

No definite agreement was made, and defendant agreed on plan of works suggested by plaintiff. During continuation of work Mr Campbell frequently visited the job, and never denied his liability for work going on. When applied to for payment, defendant always put the matter off and finally repudiated his liability for the work done.

Allan stated that Campbell 'frequently visited them and urged on them the necessity for making all haste with the work. On being asked for a progress payment Mr Campbell replied it would be all right'. After making and then putting off three appointments in one day, on the grounds that he had not made up the account, Campbell finally offered £10. Under cross-examination, Allan stated that he had 'frequently worked for Mr Campbell, and in all cases prices and terms had been agreed upon. In this case Mr Campbell had agreed to pay whatever it cost him to get the work done and told him to get the best men, and push on the work'.

Campbell deposed that Allan had worked for him before, mostly on contract, but he

did not want Allan to do what he did, and warned him that he was doing so on his own responsibility. All he wanted was 200 tons of this particular ore, which Allan contracted to supply at 3s 6d per foot. Allan took upon himself to do this driving in spite of the warning because he thought the work could be done more economically. Allan came to witness afterwards and said he could not pay his men's wages, and as witness saw that he had undertaken more than he could manage he made him a compassionate allowance of £10.

³⁴⁶ Cited in Branagan, p. 30.

³⁴⁷ See *Auckland Weekly News*, 2 May 1896, p. 30; Te Aroha Correspondent, *Waikato Times*, 5 June 1897, p. 3; *Thames Advertiser*, 16 January 1899, p. 3; *Thames Star*, 4 February 1905, p. 1, 13 July 1906, p. 2.

He had not agreed to pay for dead work, only wanting the 200 tons; it 'did not matter to him how they went about getting it'. He estimated the work done as worth £30; his mine manager suggested £35, and added that the work was of no benefit to the company, although it would assist Allan getting out his quartz. The magistrate decided that Allan had not proved Campbell had authorized the work, and noted that 'Allan did the dead work in view of Mr Campbell's promise to give him other contracts, in which case the dead work would be advantageous. He could not see that when a person let a contract, they had any need to consider how the contract was going to be carried out', and dismissed the case.³⁴⁸

THE PLANT COMPLETED

On his second visit to Te Aroha, in September 1896, Campbell announced that 'Campbell's and Lockwood's hyperphoric process' was offered to all mine owners provided they, 'separately or conjointly, agree to subscribe 20 per cent of the total cost of the plant'.³⁴⁹ This would cost no more than £1,500, 'the subscribers to have priority in the use of the machinery and the further advantage of having their quartz treated at the low rate of 5s per ton'; he guaranteed a 95 per cent return of the assay value.³⁵⁰ There is no record of anyone taking up this offer. By late July 1897, when Campbell had settled in Te Aroha, he announced that an engineer was coming from Sydney to superintend the plant's erection and that two assayers were on their way from London to run the laboratory, all under his personal supervision.³⁵¹ The engineer, Hubert Clapezzouli, arrived in October; he also became manager of the Montezuma mine.³⁵² Clapezzouli described himself as 'a mine manager of experience in New South Wales and other countries'.³⁵³ He was mine manager and first

³⁴⁸ Magistrate's Court, *Te Aroha News*, 16 July 1898, p. 2.

³⁴⁹ *Ohinemuri Gazette*, 16 September 1896, p. 4.

³⁵⁰ *Thames Advertiser*, 14 September 1896, p. 3.

³⁵¹ *Thames Advertiser*, 22 July 1897, p. 3.

³⁵² *Thames Advertiser*, 2 October 1897, p. 4; 'Inspectors' Reports re Applications for Warrants to act as Provisional Mine Manager', no. 265, Mines Department, MD 1, 11/47, ANZ-W.

³⁵³ *Te Aroha News*, 16 July 1898, p. 2.

engineer, the second engineer being John Dibbs,³⁵⁴ presumably one of the English assayers (nothing is known of his career).

According to the *New Zealand Mines Record*, the reduction works was near the railway station.³⁵⁵ In fact it was further up the hillside, northeast of Brick Street and adjacent to the small Starlight Dell Stream.³⁵⁶ A railway siding was made to the machine site in May 1897, and a contract for the battery's construction was let in July;³⁵⁷ by then all the machinery except the furnace had arrived in Auckland and some items had been shipped to Paeroa for forwarding.³⁵⁸ The first buildings erected were an office and Campbell's laboratory.³⁵⁹ By mid-August, these were nearly completed, the excavations for the plant were dug, and 'a fair start' was about to be made with the building; as well, Campbell's private residence in Brick Street was 'being rapidly pushed on'.³⁶⁰ Two months later, the *New Zealand Mines Record* printed an account of developments that appeared to have been provided by an objective reporter, for it referred to 'the Rev. J. Campbell' in the third person, but was in fact written by him. Despite the wet weather 'seriously' delaying work, 'considerable progress had been made'. Excavations for 'a shed 100 x 50' had been completed, and 'much timber and machinery' had arrived. In the 'complete laboratory', ordinary assays and 'hyperphoric assays' were being 'almost daily made under the personal superintendence' of Campbell, who devoted 'all his time to these important directions, to the erection of the plant, and to the development of the reefs'. He intended

to devote one year, or, if necessary, three years, to the investigation of the important scientific and practical questions

³⁵⁴ *New Zealand Mines Record*, 16 July 1898, p. 527.

³⁵⁵ *New Zealand Mines Record*, 16 July 1898, p. 525.

³⁵⁶ Agreement of 16 October 1900 between Raymond Lhoest and Peter Baine, Te Aroha Warden's Court, Mining Registrations 1896-1903, BCDG 11288/1a, ANZ-A; *Te Aroha News*, 25 March 1955, p. 4; for photograph of the building and its surroundings, see *Auckland Weekly News*, 4 June 1898, p.4. I am indebted to Kevin Wells of Te Aroha for showing me the site in August 2001.

³⁵⁷ *Thames Advertiser*, 24 May 1897, p. 3, 28 July 1897, p. 3.

³⁵⁸ *Waikato Argus*, 5 June 1897, p. 3; *Thames Advertiser*, 7 July 1897, p. 2; Joseph Campbell to Minister of Mines, 20 July 1897, Mines Department, MD 1, 97/1488, ANZ-W.

³⁵⁹ *Thames Advertiser*, 17 August 1897, p. 3.

³⁶⁰ 'Twinkler', 'Te Aroha Notes', *Thames Advertiser*, 17 August 1897, p. 3.

connected with the development of the gold reefs of Te Aroha in particular and of the whole of the Hauraki Peninsula generally. Owing to the delays caused by the wet weather it will probably be the beginning of the New Year before the plant is in full swing.³⁶¹

At the beginning of December, a fire on an Auckland wharf destroyed four small cases of machinery, and the late arrival of the furnace meant that he would not be able to treat any ore until February.³⁶²

In mid-October, Campbell's report on both plant and process published in the *Mines Record* stressed the new features:

The plans show a very complete plant for breaking 50 tons a day & presenting two or three novelties e.g. water & steam power are both dispensed with & a 70 h/p [horse-power] Crossley gas Engine is used instead. The plant for making the Dowson gas required for driving this Engine is worked in conjunction with that required for the manufacture of the Producer gas for heating the furnace & and water gas for treating the ore. All parts of the machinery are up to date in every respect & were carefully selected or designed according to the instructions of Rev. J. Campbell & quite apart from the special treatment of the ore the plant will attract the attention of all interested in mining machinery. From the plant we gather that the ore will either be finely pulverized or simply broken to the size of peas according to the nature of the ore. It will then be automatically fed into the furnace hoppers whence it will pass as required into the furnaces heated by producer gas to a temperature of 2000° F. Here it remains for 2 hours during which time it is subjected to treatment by water gas which eliminates all the base materials with which the gold is combined however complex they may be, leaving it perfectly free for amalgamation. When treated the coarse ore travels to a grinding mill & thence to amalgamators of the most approved type. If previously finely pulverized the treated or travels direct to these amalgamators. In either case it is claimed that 95% of the assay value will be saved from all ores however refractory.

A complete laboratory has been erected & here ordinary assays, & what are termed hyperphonic-assays are being almost daily made under the personal supervision of the Rev. J. Campbell who is devoting all his time to these important investigations, the erection of the plant & the development of the reefs. The latter are immense low grade deposits assaying from 5/- to £5 per ton & crosscuts are being put in in various places to determine where the aerial tramway can be erected to the best advantage. It is estimated that the total cost of treatment will be 7/- to 8/- per ton with the present plant but

³⁶¹ Memorandum by Joseph Campbell, n.d. [c. August 1897], Te Aroha Warden's Court, General Correspondence 1899, BBAV 11584/5d, ANZ-A; printed, with slight variations, in *New Zealand Mines Record*, 16 October 1897, p. 103.

³⁶² *Thames Advertiser*, 4 December 1897, p. 3.

when the plans are fully carried out it is hoped to reduce the cost to 5/- per ton.³⁶³

Two detailed accounts of both plant and process were based on Campbell's information. The building, 'erected quite within Te Aroha township', was 100 feet by 80, and had three floors. The upper floor contained 'a large Crosby gas engine of 75 indicated horsepower', a 'very substantial piece of machinery' connected with the main four-inch shaft by a driving belt. A nine-horse power boiler using Waikato coal produced steam which was conveyed by a small pipe to a generator containing 'a mass of red-hot charcoal. By turning on the steam combined with a certain quantity of air', Dowson gas was produced 'and then purified by passing through a hydraulic box, hence to a cake scrubber, and finally to a sawdust scrubber'. The purified gas was 'composed of nitrogen 50 per cent, carbonic acid gas 25 per cent, and a few other unimportant gases', was stored in a gasometer 12 feet in diameter by ten feet deep. The producer gas, the first to be made, heated the furnace, and the water gas was used for the thermo-hyperphoric treatment. This plant, new to New Zealand, was 'made by Dempster Brothers, of Manchester, after the latest approved English and American designs'; it generated both 'the producer gas taking the place of fuel and the water gas required for treatment'.

The ore was first put through a Strogrock-breaker, which reduced it to a uniform size, either '3/4-inch' or '1/2in mesh'. An iron feeder conveyed it to 'an Askam Brothers' Tiger-mill', making 265 revolutions a minute, 'capable of pulverizing it to any degree of fineness required, the present intention being to reduce it to the size of grains of wheat'. An automatic elevator took this from the hopper under the Tiger mill into 'large hoppers, erected over the furnace', which would feed three small hoppers directly above the hyperphoric furnace on the second floor, which could treat 40 tons daily. This furnace, 'an admirable bit of work', was 'carefully and substantially constructed' using special fire bricks. It had 'one large combustion chamber and three rows of brick retorts, four in a row, placed one on top of the other or in tiers, the whole being strongly braced together, sides, back, and front with heavy railway iron, to prevent it expanding and so cracking with the great heat'. The producer gas was 'conducted through a bricked flue, on either side of which are secondary air flues, into the combustion chamber', where it was ignited, heating the ore to 2,000 degrees Fahrenheit. When the water gas, conveyed to the retorts by iron pipes, was turned on, the treatment of the ore began 'in three stages, representing the three tiers, the

³⁶³ Memorandum by Joseph Campbell, n.d. [c. August 1897], Te Aroha Warden's Court, General Correspondence 1899, BBAV 11584/5d, ANZ-A; printed, with slight variations, in *New Zealand Mines Record*, 16 October 1897, p. 103.

ore passing from one to the other' until emerging 'from the lowest bench' as 'of free milling quality, never mind how refractory before'. After being raked out of the furnace, it was stacked on a platform.

The ore then fell into a Challenge ore-feeder leading directly into a Merrill's Tension mill 'with a mesh of about 40 to the inch'. This mill, using mercury, both ground and amalgamated, with an anticipated saving of 80 per cent. An adaptation of the Chilian mill, and entirely new to New Zealand, it had four two-ton rollers revolving on a circular plate and could be 'screwed down to any desired tension', with a result 'similar to the stamper battery'. The ore fed into it by iron shoots fell 'directly under the rollers', where it was 'finely pulverized and forced into a depression round the edge of the plate' containing mercury. Water then forced 'the sludge' through screens and then by launders to three Gold King amalgamators, which were expected to save 'the greater portion of the residue, or in all about 95 per cent'. These amalgamators were 'really long iron cylinders' lying horizontally, and revolving 30 times a minute; electro-plated, and containing mercury, 'any gold not caught in the mill has a chance of amalgamating here'.³⁶⁴

A serious setback was narrowly averted when woodwork in the assay office adjoining the furnace chimney became heated to the point of ignition. Some men working later than usual saw the smoke and put the fire out before the office and possibly the main building were destroyed.³⁶⁵ All the machinery had arrived in Te Aroha by mid-February, when it was expected the plant would be operational early in March.³⁶⁶ Although construction had taken longer than expected, the *Te Aroha News* was sympathetic:

Everyone who has any knowledge of the inner workings of the Montezuma plant is full of admiration for the managing director for his devotion to his great project. In the fact of difficulties and drawbacks apparently insurmountable, Mr Campbell has struggled on with a courage which is magnificent if it is not business - for he is sure to suffer from it in the long run. No man can burn the candle at both ends, as he has been doing for the last month or two, with impunity. Not the lightest among the strokes of ill-fortune befalling this capable and ingenious gentleman

³⁶⁴ Special Reporter, *Auckland Star*, 17 March 1898, p. 7; George Wilson to Minister of Mines, 12 May 1898, *AJHR*, 1898, C-3, p. 74.

³⁶⁵ *Te Aroha News*, 10 February 1898, p. 2.

³⁶⁶ *Thames Advertiser*, 16 February 1898, p. 3.

since he began construction was the serious illness of his ‘right-hand man’, Clapezzouli, who had been suffering for a month from congestion of the lungs ‘brought on through the combined effects of over-work, anxiety, and exposure’. Campbell had been ‘studiously attentive to the wants of his lieutenant’.³⁶⁷ In March, a ‘ground tramway’ was ‘being laid down to connect the works with the lower terminal of the Tui Aerial tram’.³⁶⁸ Two months later, Wilson reported that ‘a self-acting wire tram is on the ground, and will be erected as soon as the most suitable place has been determined’.³⁶⁹

The cost of the plant as first erected was £12,000;³⁷⁰ after modification this rose to £15,000.³⁷¹ This compared with his July 1896 claim that one to treat 20 tons daily could be erected for £1,500,³⁷² his offer to erect one for that price in September that year,³⁷³ his 1897 estimate that a plant to treat 40 tons daily would cost about £6,000,³⁷⁴ and the later expansion being estimated to cost no more than £1,000.³⁷⁵ In 1922 he claimed it had cost £8,000.³⁷⁶ The total cost the company had incurred by July 1898 was £13,500, which Campbell explained had been spent in several ways:

Machinery purchased in England, £3,000; machinery purchased in America, £500; machinery purchased in New Zealand, £2,000; and erection of buildings and machinery, £2,000. The remaining £6,000 has been expended in securing the various properties the company now hold, their water-rights, &c, and in their systematic development.³⁷⁷

The latter amount seems very excessive, for only a modest amount of mining had taken place. The largest number of miners employed in the

³⁶⁷ *Te Aroha News*, 12 May 1898, p. 2.

³⁶⁸ Special Reporter, *Auckland Star*, 17 March 1898, p. 7.

³⁶⁹ George Wilson to Minister of Mines, 12 May 1898, *AJHR*, 1898, C-3, p. 74.

³⁷⁰ *Thames Advertiser*, 23 August 1899, p. 3.

³⁷¹ *Auckland Weekly News*, 6 July 1900, p. 40.

³⁷² *Ohinemuri Gazette*, 4 July 1896, p. 5.

³⁷³ *Thames Advertiser*, 14 September 1896, p. 3.

³⁷⁴ *Auckland Weekly News*, 1 May 1897, p. 20.

³⁷⁵ *Auckland Weekly News*, 23 July 1898, p. 20.

³⁷⁶ Campbell, *Autobiographical Sketch*, [p. 8].

³⁷⁷ *New Zealand Mines Record*, 16 July 1898, p. 524.

Montezuma averaged 12 in the year to 30 March 1899.³⁷⁸ In the two previous years, first three and then four miners were employed,³⁷⁹ and little mining had taken place elsewhere. Whilst Campbell was correct in stating that new tramways had been constructed, the aerial tramway was short and the ground tramway, nearly a mile long, was over flat ground; neither would have been very expensive to construct. Campbell later informed Wilson that ‘the aerial tram and ground tramway to connect with the mill cost £800’.³⁸⁰ His statement that ‘no fees have been paid to directors, or any expenses incurred, beyond the refund of out-of-pocket expenses (£300)’ he had incurred convinced the *Mines Record* (or had he written this article?) that the company was ‘going in for truly legitimate mining’ and would not waste ‘any portion of their capital on unnecessary expenditure, which has been the cause of many mining failures of late’.³⁸¹

THE PLANT STARTS WORK

Would his process work? In all his interviews and lectures Campbell had expressed total faith, especially for treating Te Aroha ores, which, he informed a Sydney newspaper, were ‘of such a refractory nature that I must confess I know of no other method that will yield payable results’.³⁸² This was typical of his claims; six months previously he had said that ‘by uniting with another process he has the most perfect furnace and ore-treating method in the world’.³⁸³ In November 1897 he lectured about it in Auckland, and four months later at Waihi.³⁸⁴ An illustrated lecture at Te Aroha in March 1898, ‘Gems from my Collection’, included photographs of his furnace and an explanation of the process.

His remarks were characterized by that sanguine buoyancy which we have come to associate with Mr Campbell, and in taking his audience into his confidence he assured them that although all the claims in Te Aroha would not prove successful, yet a sufficient

³⁷⁸ George Wilson to Minister of Mines, 12 May 1899, *AJHR*, 1899, C-3, p. 69.

³⁷⁹ Warden to Minister of Mines, 29 June 1897, *AJHR*, 1897, C-3, p. 99; James Coutts to Under-Secretary, Mines Department, 18 April 1898, *AJHR*, 1898, C-3A, p. 53.

³⁸⁰ Joseph Campbell to George Wilson, n.d., cited in *AJHR*, 1899, C-3, p. 69.

³⁸¹ *New Zealand Mines Record*, 16 July 1898, p. 524.

³⁸² Cited in *Auckland Weekly News*, 11 September 1897, p. 19.

³⁸³ *Thames Advertiser*, 17 March 1897, p. 3.

³⁸⁴ *Thames Advertiser*, 17 November 1897, p. 2; *Te Aroha News*, 1 March 1898, p. 2.

number would, and so enable Te Aroha to take no mean place among the gold producing centres of the world,

a statement greeted with loud applause.³⁸⁵

Observers hoped that his process would live up to his promises. One mining commentator wrote that the future of Te Aroha mining was assured if it was as successful ‘in a large way’ as in his experiments. As other parts of the peninsula contained ‘buck reefs’, his experiments were ‘watched with interest by other than Te Aroha folk’.³⁸⁶ Sir George Dibbs, ex-Premier of New South Wales, interviewed when passing through Auckland, said that he had examined Campbell's process and believed it ‘to be thoroughly practicable. The highest authority in England, the chief chemist to the British Mint, and some of the leading men in America endorse its practicability’. It would ‘revolutionize goldmining all over the world’, benefiting areas containing refractory ore. Within months of starting his plant Campbell would ‘give to the world an object lesson’.³⁸⁷ Dibbs had given Campbell a reference when he left Sydney, writing that he ‘stands deservedly high in the sciences he has so long studied’, and ‘the State that secures him as a permanent resident, with a full scope of action for his great abilities, will do well for its people’; he added, superfluously, that Campbell's personal life was ‘spotless’.³⁸⁸

The *Te Aroha News* always greeted every potential saviour of its goldfields with rapture, as with Campbell in May 1898, for example:

While the stone Mr Campbell's process is best fitted to treat is forthcoming, so long will the process be a success, but when the supply of stuff amenable to this expensive process is exhausted, we feel sure he will be able, such is our confidence in his scientific ingenuity, to evolve another process to deal with the ultra-refractory remainder.³⁸⁹

³⁸⁵ *Te Aroha News*, 24 March 1898, p. 2.

³⁸⁶ T.W. Rhodes, *The History and Resources of the Auckland Goldfields* (Coromandel, 1899), p. 14.

³⁸⁷ *Thames Advertiser*, 27 July 1897, p. 3.

³⁸⁸ Testimonial by Sir George Dibbs, n.d. [c. 1896], printed in Campbell, *Autobiographical Sketch*, [p. 16].

³⁸⁹ Editorial, *Te Aroha News*, 10 May 1898, p. 2.

Others had doubts. One Te Aroha mining correspondent commented that his visit to the Montezuma ‘convinced me that he could not have chosen a more suitable class of ore wherewith to demonstrate the practicability of his theory’. By which he meant that the Montezuma and Mount Morgan lodes were ‘distinguished by the same characteristics, being hard, blue, highly mineralised, and low grade; some of it, as in the case of Montezuma No. 2, being encrusted with mundic’. Only if Campbell could cope with refractory ore as well as he claimed did the owners have a valuable property.³⁹⁰ Three months later, when noting a remark about the ‘assured success’ of the process, he hoped this confidence would ‘not be doomed to disappointment’.³⁹¹ The *Thames Advertiser* wrote in August 1897 that Campbell had not only his ‘reputation as a scientist to sustain but he also has to show that as one who preaches from the text of the Great Socialist, he is not actuated by a desire to filch money from his fellow-beings for the sake of personal gain’. It quoted a Te Aroha correspondent about Campbell at work:

He can frequently be seen mooching around the Montezuma claim, “his face sickled o'er with the pale cast of thought,” pondering over the minutae of his great undertaking. It is no exaggeration to say that many eyes of the mining world in the seven colonies are fixed upon Te Aroha and the figure of this clerical expert. Through an opposition to which many men would have succumbed ere this, Mr Campbell has fought his way, and there are many who will tell you that the dream of his later years is not far off realisation, though the fact cannot be overlooked that even in Te Aroha there are many “doubting Thomases.” As far as we can gather, mining men from all parts of New Zealand, South Africa, Western Australia and other places are of opinion that the hyperphoric treatment should not be received without caution, the feeling being that the process, with all due respect to Mr Campbell, is as yet but in the experimental stage. The prevalent idea, however, is that it should receive a fair trial.³⁹²

John Watson Walker, who had brought him to New Zealand, after Campbell told a banquet that the process had finally been perfected

³⁹⁰ ‘Werahiko’, ‘Our Te Aroha Letter’, *New Zealand Mining Standard and Financial News*, 27 February 1897, p. 5.

³⁹¹ ‘Werahiko’, ‘Our Te Aroha Letter’, *New Zealand Mining Standard and Financial News*, 6 May 1897, p. 3.

³⁹² *Thames Advertiser*, 3 August 1897, p. 2.

in a racy speech said he was not quite as sanguine of success as Mr Campbell. He had been a long while in the business, and had seen too many reverses, but at the same time he thought they should suspend their judgment on the “Doctor’s” process, and think charitably of it, until they were in a better position to judge of its merits.³⁹³

In late April 1898, Campbell announced that his plant would start work within two weeks. He had

every confidence of success. Should the process be successful, it will quite revolutionize mining, both as regards economy and the treatment of ore otherwise too rebellious for any known process. Te Aroha is on the tip-toe of expectancy, while many mining engineers do not disguise their want of faith in the process. In any case some preliminary difficulties are bound to be met with.³⁹⁴

Fifty tons were sent for testing from the Grand Result and the same amount from Puhipuhi, as well as samples of up to 100 tons from other mines.³⁹⁵ When in Auckland at the end of the month, Campbell announced that ‘everything worked very satisfactorily’ during ‘a preliminary run’, and the plant would be fully running in a few days’ time.³⁹⁶ The *Te Aroha News* also reported that this trial was ‘attended with marked success’.³⁹⁷ A *Te Aroha Times* reporter, ‘on seeing large clouds of smoke and steam hovering round’ the plant on the morning of 2 May, went to investigate:

From what we could gather it would appear that everything was just on the point of starting. Though we cannot furnish our readers with particulars just yet, we ascertained that the smoke and steam were caused by the working of the gas-producers, and that the massive furnace was gradually attaining a great heat. This furnace has to be heated up to the enormous temperature of something like 2000 degrees Farnh. We are informed that great interest centres on this furnace, on account of it being the first of its kind that has ever been heated by producer gas. On walking

³⁹³ *Te Aroha News*, 26 May 1898, p. 2.

³⁹⁴ *Northern Advocate*, 16 April 1898, p. 4.

³⁹⁵ *Thames Advertiser*, 13 January 1898, p. 3; *Te Aroha Times*, n.d., reprinted in *Thames Advertiser*, 7 May 1898, p. 4.

³⁹⁶ *Thames Advertiser*, 27 April 1898, p. 3.

³⁹⁷ *Te Aroha News*, 30 April 1898, p. 2.

round the outside - we were not allowed inside - we noticed large quantities of ore stacked ready for treatment.³⁹⁸

The *Te Aroha News* reported, three days later, that the machinery was

running with smoothness, and we understand an experimental crushing put through recently was successful; still Mr Campbell has determined to preserve a rigid silence until the plant may fairly be said to be in perfect going order, and the bare chance of a mishap eliminated. We have spoken to several who have been privileged to go over the battery, and one and all declare themselves satisfied that the process will be a success.³⁹⁹

Five days later, it wrote that 'Te Aroha has been standing on the tiptoe of expectation so long that she may be excused if she is growing impatient, but neither science nor the Rev. Joseph Campbell will be hurried'.⁴⁰⁰ After two more days, it quoted Campbell as saying that

everything promises to be pre-eminently satisfactory. All parts of the machinery perform the duties assigned to them, while the furnace is one of the most perfect he has ever seen. During the next three or four days one or two pullies are to be adjusted, slope of hopper altered, shoots arranged, and then the running will proceed without the slightest hitch. Mr Campbell says that he is satisfied that his process will be very successful in dealing with all classes of New Zealand ores.⁴⁰¹

The *Ohinemuri Gazette* agreed the process worked, 'despite all captious critics'.⁴⁰² As 'everything worked satisfactorily', Campbell hoped 'within a few days to get steadily to work'.⁴⁰³ Late in May, he informed a Te Aroha banquet that,

after many months of anxious care and hard work, he had at last made a start with his battery, and although there were some initial difficulties to be overcome, he was able to tell them that he was convinced of the ability of his process to overcome the

³⁹⁸ *Te Aroha Times*, n.d., reprinted in *Thames Advertiser*, 7 May 1898, p. 4.

³⁹⁹ *Te Aroha News*, 5 May 1898, p. 2.

⁴⁰⁰ *Te Aroha News*, 10 May 1898, p. 2.

⁴⁰¹ *Te Aroha News*, 12 May 1898, p. 2.

⁴⁰² *Ohinemuri Gazette*, 7 May 1898, p. 2.

⁴⁰³ *New Zealand Graphic*, 7 May 1898, p. 574.

difficulty with refractory ores.... He was just as convinced as when he first came of the ability of the Thermo-hyperphoric process to deal with the low grade ores abounding in the district.⁴⁰⁴

Another version of this speech quoted him as responding to those residents who

wondered why it was that he had been so very mysterious, and apparently desirous of keeping everything secret. Well that was because many initial difficulties had to be overcome, and he did not want to be hampered with too many around him. However, he hoped soon to be able to ask them all up when he would have much pleasure of explaining all the details to them. After twenty-four days and nights of anxious toil he was able to tell them that these difficulties had been overcome.

He expected that 'in the near future' similar works might be started at Waiorongomai, and 'felt confident that success would attend his efforts'.⁴⁰⁵

The plant broke down for a few days in mid-June,⁴⁰⁶ but by early July 'about 200 tons' had been treated. In the cautious words of the *Thames Star*, 'the results have been sufficiently satisfactory, it is stated, to demonstrate absolutely that the new process' was 'a success'. Campbell had to make 'a little alteration in the actual crushing of the ore, but none as to the application of his patent process for extracting the bullion'.⁴⁰⁷ Campbell was able to show the *Te Aroha News* a

wedge of bullion weighing some 102oz and valued at from 8s 6d to 10s per oz. This bullion is recovered from low grade ores not amenable to the cyanide process and can be made to pay by the hyperphoric process. At present this extremely low grade refractory ore is being treated at 8s per ton; but Mr Campbell hopes to reduce the cost of treatment to 5s per ton. The rockbreaker has proved a source of disappointment and will have to be renewed as the original plant does not crush small enough.

Campbell, being 'perfectly satisfied', would advise the company to expand the plant's capacity. 'Accordingly, work would be suspended for

⁴⁰⁴ *Waikato Argus*, 26 May 1898, p. 4.

⁴⁰⁵ *Te Aroha News*, 26 May 1898, p. 2.

⁴⁰⁶ *Te Aroha News*, 18 June 1898, p. 2.

⁴⁰⁷ *Thames Star*, 6 July 1898, p. 1.

several weeks, and he might have to visit England to lay ‘the results of his operations before his directors’.⁴⁰⁸

A Te Aroha correspondent wrote that this ‘wedge of bullion’ had been produced ‘from a parcel of rejected Tui ore, which had been lying at the Tui for years, and regarded by the owners as next to valueless’. Campbell was confident that ‘certain improvements’ would reduce the cost of treatment. ‘Other samples of better ore’ had produced ‘from 60 to 80 per cent of their assay value’, and ‘after weeks of anxious labour’ Campbell was satisfied that his process was ‘applicable to all the ores in the Te Aroha district, and that ultimately a return of 90 per cent will be reached’. The closure of the plant was now to be for three months while adequate rock-breaking machinery was installed, and during that time it was likely to be expanded so that over 50 tons could be treated daily. Campbell might have to visit London to convince the directors to extend the capacity in this way, and was quoted as speaking, yet again, ‘very hopefully regarding the future of Te Aroha mining’, asserting that there would be ‘work for a large number of miners here in a few months’.⁴⁰⁹ After using 100 tons of Waikato coal, he was ‘satisfied’ it was ‘well adapted for the manufacture of gas for his heating furnaces, and water gas for treating ore’.⁴¹⁰

When in Auckland in mid-July and asked for precise details of the results, Campbell did not provide them but declared that ‘in every way’ the furnace had come ‘up to expectations’, and praised the assistance of Auckland Gas Company engineers and the bricks this company provided.

There were difficulties to be overcome at first, but the furnace can now be maintained at a temperature of 2000 degrees by the use of gaseous fuel, with an abundant supply of water-gas going through the retorts all the while. The consumption of coal averaged about three tons per day, and the total cost of the treatment of the ore was about 8s per ton.

After the ‘rejected Tui quartz’ had got the plant into working order, from the subsequent small parcel of Cadman ore treated when ‘the mill was scarcely in the best working order’ 60 per cent of the bullion was saved, which he was convinced would become 85 per cent. He had then saved 80 per cent of some medium-grade Tui ore, which he anticipated would become

⁴⁰⁸ *Te Aroha News*, 9 July 1898, p. 2.

⁴⁰⁹ Te Aroha Correspondent, *Thames Advertiser*, 13 July 1898, p. 4.

⁴¹⁰ *Thames Advertiser*, 13 July 1898, p. 4, 14 September 1898, p. 3; *New Zealand Graphic*, 23 July 1898, p. 106.

95 per cent. These were 'absolutely savings of bullion', and he undertook 'to do the same with any ore of similar quality, and obtain the same results'. Some details of the methods of treating ore from Puhipuhi, Grand Result, and Plutus were given, and 'in these experiments many important and interesting points were noticed'. As he claimed to have discovered how to smelt ore containing sulphides, extracting 90 per cent of the value at a cost of 30s per ton, he would erect a smelting furnace. 'Thousands and thousands of tons of lead ores available' which had been difficult to treat but could be easily processed now.

Having failed to elicit details of amounts and values, the reporter asked why he was going to England, for there was 'an impression that extensive alterations' were required, that the company are short of capital, and that if extra capital was not forthcoming 'the whole thing will be abandoned'. Campbell laughed, and denied 'the slightest truth in the rumour'. The alterations would 'not cost more than £1000', and were necessary because the low grade ore meant large quantities had to be treated. He admitted the plant had 'cost more than anticipated, and had we rich refractory ore to treat, we would not have to increase the plant', but this was 'necessary to secure decent profits. As to abandoning the thing now - nothing is further from our thoughts. Why, we have but commenced'. The company had a capital of £30,000, 'of which £20,000 was available. The expenditure so far had been about £14,000, including the manufacture and erection of plant, and acquirement and development of properties'. Visiting England would enable him to explain the results not only to the Montezuma Company but also to the Thermo-Hyperphoric Syndicate, whom he would urge to enlarge their London operations and to develop some of their mining properties. The rock-breaker was inadequate, and he would change to system of crushing to reduce the ore to smaller pieces,

and thus allow large quantities to be put through. We will increase the amalgamating plant, and erect concentrating tables to deal with certain classes of ore. I can honestly say that the treatment has proved a success in each parcel of ore dealt with, and all that we now require is a little time in which to effect certain alterations, so as to enable us to put through from 50 to 60 tons per day, at a cost of about 8s per ton. The treatment of refractory ores is now an easy matter, and I am prepared to treat 25s ore, and make it pay its way in any part of the country where suitable fuel ... can be obtained at a cheap cost.⁴¹¹

⁴¹¹ *Auckland Weekly News*, 23 July 1898, p. 20.

Just how honestly Campbell could make such sweeping claims would later be a matter of controversy. Hopes that his claims were justified was expressed by one columnist:

The report just published ... seems amply to justify the Rev. Mr Campbell's expectations, and must be gratifying to him, and points a prosperous future for many mines heretofore considered worthless or nearly so. With so many undertakings, which a short time ago were considered to have splendid futures, in a state of partial or total collapse, this news comes at an opportune moment, and will help to restore confidence in the minds of many who have almost begun to despair and to think that the whole of the late boom was an *ignis fatuus* [stupid enthusiasm] by means of which many trusting souls were lured to (financial) destruction. It is hoped that every facility will be given to Mr Campbell, so that he may soon be in a position, with a larger plant, to reduce 50 tons per day, and give, by this means, employment, payable employment to many in our midst, who are just now not overburdened with work.⁴¹²

The initial working prompted two expressions of doubt, one public and one private. The *Waitekauri Age* regretted that Campbell had provided insufficient details of his 'novel' process:

The facts he has left unrecorded might have cleared up the cloud of mystery which has hung over the process since its inception. The facts he has recorded only wrap a thicker veil around it. The information to have been valuable should have stated the number of tons treated. Without that information, the result of the trial experiment is absolutely nil - so far as outsiders are concerned. The fact that the works are to be closed down for "about" three months is also ominous: for although the plant may be too small for extended operations, if the present experiment had proved payable one would have supposed it the reverse of payable to hang up the mine for so long a time.⁴¹³

Impeccable logic, and supported by a letter written a few days later to the Minister of Mines from James Mills,⁴¹⁴ who had been associated with Campbell in testing the ore in his Cadman mine:⁴¹⁵

⁴¹² 'The Admiral', 'Topics of the Day', *Thames Star*, 16 July 1898, p. 2.

⁴¹³ *Waitekauri Age*, n.d., reprinted in *Thames Advertiser*, 20 July 1898, p. 4.

⁴¹⁴ See paper on his life.

I do not think from all I hear that it is a success so far. I have it on the Best Authority (outside Mr Campbell) that is from the man who has carted Coal and the quartz that he has been using about 35 tons of Coal per week and I have it from men who have been working in the Battery that he has not been treating that quantity of quartz, and he has had three shifts of nine men employed, so that I do not think we shall get any relief from that quarter.⁴¹⁶

As another indication of problems, Campbell's promise to show visitors over the plant was not carried out. George Wilson provided more details of his achievement:

The mill was worked experimentally for fifty days; 307 tons of quartz were dealt with, some being treated and amalgamated, some concentrated raw, and concentrate treated. Some of the ore was worth 12s 6d per ton, and some of greater value. The total value of the bullion extracted was £191 15s, the price per ounce being from 5s to 10s.⁴¹⁷

Other figures for the year ending 31 March 1899 gave 301 tons treated for a return of 194oz 4dwt, value £549 7s 6d.⁴¹⁸ Assuming the value per ounce was as given, the lower estimate of the total value was correct. The mining inspector, now James Coutts, reported that the Plutus and Ruakaka had been 'intermittently worked, but parcels of ore broken from the reefs in those mines and treated at the thermo-hyperphoric reduction plant did not turn out as well as anticipated, and in consequence work was stopped'.⁴¹⁹

On 28 July Campbell requested six months' protection for all his mines except the Ruakaka (protection of this having been applied for in May) to enable him to complete and enlarge his plant. Approval was given in

⁴¹⁵ For his ownership of this, see *AJHR*, 1898, C-3, p. 73.

⁴¹⁶ James Mills to Minister of Mines, 25 July 1898, Mines Department, MD 1A, 8/50, Part 1, ANZ-W.

⁴¹⁷ George Wilson to Minister of Mines, 12 May 1899, *AJHR*, 1899, C-3, p. 69.

⁴¹⁸ *AJHR*, 1899, C-3, p. 77; reprinted in *New Zealand Mines Record*, 16 October 1899, p. 94.

⁴¹⁹ James Coutts to Under-Secretary, Mines Department, 29 April 1899, *AJHR*, 1899, C-3A, p. 53.

August,⁴²⁰ just before it was announced he had postponed his trip to London, 'having been requested by many people interested in mining to remain here for the present in order to deal with parcels of refractory ore'.⁴²¹ He had a three-month option to purchase the Waiorongomai battery and mines owned by Aroha Gold Mines Ltd, and would enlarge his plant and add cyanide treatment to his process, thereby, he again anticipated, saving 95 per cent of the value.⁴²² 'For exhibition purposes' he sent his bullion to England, along with samples of the ore from which it was taken, repeating that he had achieved 'from 60 to 80 per cent extraction from various parcels of exceedingly refractory ore'.⁴²³ He informed the *New Zealand Mines Record* that 'the satisfactory results' had met his expectations. 'Though, like in all new departures, several minor difficulties were met with in starting the new machinery, much of which had never been seen in this country', these had 'disappeared' and the plant was 'working smoothly'. He would make 'certain little alterations' to the mill and amalgamators 'to increase the extraction to 95 per cent. With the economical method of working adopted, and from the actual experience of the past couple of months', he expected the cost would 'in no case exceed 8s per ton'.⁴²⁴ (This claim for economical working did not square with what Mills had discovered.) Campbell's self-promotion led him to claim, once more, that 'the importance of the new process cannot be too highly estimated, meaning as it does the successful treatment of thousands of tons of payable ore all over the Hauraki Peninsula, which have hitherto remained untreated on account of their refractory character'.⁴²⁵ Presumably his companies were unimpressed with his claims, because he was unable to acquire the Aroha Gold Mines' claims and battery, which on his recommendation was acquired by Edwin Hardy's syndicate.⁴²⁶

DIVERSIONS

⁴²⁰ Te Aroha Warden's Court, Mining Applications 1898, 28, 35-41/1898, BBAV 11582/4a, ANZ-A.

⁴²¹ *New Zealand Graphic*, 23 July 1898, p. 106.

⁴²² *Thames Advertiser*, 8 August 1898, p. 3; *New Zealand Graphic*, 3 September 1898, p. 303.

⁴²³ *Thames Advertiser*, 31 August 1898, p. 3.

⁴²⁴ *New Zealand Mines Record*, 16 July 1898, p. 526.

⁴²⁵ *New Zealand Mines Record*, 16 July 1898, pp. 526-527.

⁴²⁶ *New Zealand Graphic*, 26 November 1898, pp. 689-690.

Campbell's ever-fertile brain kept distracting him from his main task. The articles of association of the Montezuma Company gave him 'wide powers to enter into outside schemes', with the directors' sanction.⁴²⁷ In April 1897, he was contemplating establishing a sanatorium on the domain,⁴²⁸ though nothing came of this idea. In September 1898 he invited some residents to observe his demonstration of the use of gas for illumination. The 'beautiful, soft, clear light', resembling acetylene gas, was 'composed in equal proportions per volume of carbonic oxide and hydrogen', and by using Taupiri coal its natural odour avoided the danger of a leakage being undetected. Campbell claimed it could be produced for almost a nominal cost and sold for half the price charged in Hamilton and Paeroa yet still make a handsome profit; as well, he could produce incandescent burners at a quarter of the cost of the existing ones. He promised 'to give a more public exhibition of the gas in about a month's time, when his arrangements will be more complete than at present'. A plant to produce this gas would cost £2,000.⁴²⁹ It was never built, no other public display was reported, and his invention was never patented.

In June 1899, John Williams sued him for £10, balance of rent due on his soda springs, leased to Campbell for £20 per annum. Campbell had an option to purchase them for £300 and had planned to develop them by floating a company in London. He told the magistrate that all the properties he acquired were taken up on behalf of the Montezuma Company, 'even the house in which he lived'.⁴³⁰ 'He did not float the subsidiary company, because he found the soda springs to be worthless', and the matter was 'dropped at the directors' suggestion'. As Williams should have known Campbell had been acting on behalf of the company, he lost his case.⁴³¹

In 1900, Campbell claimed that in his three years of experimentation at Te Aroha,

Many most important matters have been elucidated, notably the manufacture of a gas suitable for heating and lighting from

⁴²⁷ Te Aroha Magistrate's Court, *Thames Advertiser*, 15 June 1899, p. 3.

⁴²⁸ *Auckland Weekly News*, 10 April 1897, p. 2.

⁴²⁹ *New Zealand Herald*, 13 September 1898, p. 5; *Ohinemuri Gazette*, 14 September 1898, p. 3; *Thames Star*, 14 September 1898, p. 4.

⁴³⁰ *New Zealand Herald*, 14 June 1899, p. 5.

⁴³¹ Te Aroha Magistrate's Court, *Thames Advertiser*, 15 June 1899, p. 3.

Waikato coal. The calorific qualities of coal from each of the mines in the Waikato have been carefully tested by himself. This matter alone occupied three months of his attention. Another most important matter is the preparation of white lead, direct from sulphides of zinc and lead, by means of a furnace of peculiar construction, at a very low cost. The development, however, showed that there was not sufficient quantity of ore to warrant the erection of a plant for the preparation of this pigment. Mr Campbell has, however, amassed much valuable information, which he hopes to make use of by-and-bye.⁴³²

DISCREDITING THE PROCESS

In October 1898, Campbell insisted that he had ‘determined beyond doubt that 80 to 96 per cent of bullion in the most refractory ores’ could be saved at a cost of from 8s to 12s.⁴³³ Instead of going to London to prove this to his fellow directors, the latter sent a representative, Jonas Hey, to inspect the plant. Hey was a Scarborough engineer who held 1,370 shares.⁴³⁴ Despite Campbell earlier laughing off the rumour that the company was short of capital and might have to cease operations,⁴³⁵ it was correct. After Hey reported unfavourably, at the beginning of 1899, Campbell told the directors ‘future prospects’ were satisfactory’ and ‘there was every reason to believe’ the process ‘would result satisfactorily’.⁴³⁶ He publicly announced that ‘the principal points on which a difference of opinion existed’ was that Hey estimated the cost of treatment at 12s per ton, as against Campbell’s 8s, ‘and that the plant should have been erected in New South Wales and not in New Zealand’. He claimed Hey had been

prejudiced against New Zealand mining in favour of Australia before leaving London, and because he could not be shown better surface prospects than thousands of tons of ore yielding from 15s to 56s per ton, and which development would probably prove of greater value, he presumed to say there was nothing in the property.⁴³⁷

⁴³² *Auckland Weekly News*, 6 July 1900, p. 40.

⁴³³ *Thames Advertiser*, 28 October 1898, p. 4.

⁴³⁴ Company Files, BT 31/7207/50975, The National Archives, Kew, London.

⁴³⁵ *Auckland Weekly News*, 23 July 1898, p. 20.

⁴³⁶ *Auckland Weekly News*, 6 January 1899, p. 14; *Thames Advertiser*, 5 January 1899, p. 4.

⁴³⁷ *Auckland Weekly News*, 13 January 1899, p. 19.

In a report to the Great Barrier Gold and Silver Mining Company, written in the same month, Campbell stated that he had ‘met with some opposition from my co-director, who saw a mine and mining machinery for the first time in his life when I showed him this company’s property, but who is a Bradford weaver, and who thought his qualifications as such fitted him to judge New Zealand mining, which he has condemned in sweeping terms’.⁴³⁸ In fact, Hey was a Scarborough engineer, and at the time of his visit was not a director.⁴³⁹

Campbell claimed he could treat Great Barrier Island ore at a cost of 7s a ton.⁴⁴⁰ In March 1898, the directors of the Iona Company declined his offer of an option because ‘the terms were not good enough, and the directors want to see the Campbell process made a success of before they commit themselves to it’.⁴⁴¹ In August, ‘for experimental purposes’ the Great Barrier Gold and Silver Mining Company gave him 40 tons of ‘good quartz’.⁴⁴² Three months later, it was reported that his ‘experiment’ had produced ‘very satisfactory results’.⁴⁴³ But in December, Joshua Jackson, a mining agent and sharebroker,⁴⁴⁴ and one of the main shareholders, complained that neither directors nor company officials had received any results. The ore had been given to Campbell at no cost to him ‘on condition that it was to be treated by his thermo-hyperphoric process, with all diligence and care, the results to be furnished to our directors, etc, such as, actual extraction of bullion, percentage saved, value of ore before treatment, etc’.

Many reasons are advanced for the continued silence as to the result of the ore in question, cynical shareholders advocating that the hyperphoric process is essentially that of the laboratory, and when tested on a working or commercial scale, will prove a failure, and that the inventor thereof is withholding the results until we have eaten our Christmas dinner, so that our appetites may not be spoiled by the knowledge he may impart to us.

⁴³⁸ *Auckland Weekly News*, 13 October 1899, p. 19.

⁴³⁹ Company Files, BT 31/7207/50975, The National Archives, Kew, London.

⁴⁴⁰ *Thames Advertiser*, 28 October 1897, p. 3.

⁴⁴¹ ‘Obadiah’, ‘Shares and Mining’, *Observer*, 5 March 1898, p. 9.

⁴⁴² *Observer*, 27 August 1898, p. 3.

⁴⁴³ *New Zealand Graphic*, 26 November 1898, p. 689.

⁴⁴⁴ See *Cyclopedia of New Zealand*, vol. 2, pp. 469-470.

Jackson claimed to have more faith in Campbell's scientific skills than these cynics, but resented 'the unfair manner' in which information was withheld.⁴⁴⁵ Campbell responded that he had given a progress report on 19 October, that the balance of ore was treated during the past week, and that he had not had time to make up the returns. He promised to provide these after Christmas,

but in order that Mr Jackson and others may the more enjoy their Christmas dinner, I will tell them that I can guarantee a saving of 80 per cent, and believe I can extract 95 per cent of the assay value. That value is not as high as is generally supposed, as the 40 tons sent to me have averaged a little over £5.

As proof of his belief in the ore 'and the adaptability of my treatment', he had purchased 200 shares in their company. 'I am sorry that anyone should think I withheld information.... Those who know me best generally blame me for telling too much, but I like to make known any facts I may discover, the publication of which may lead to the development of your goldfields', if the capital that was 'terribly hard to get' was provided.⁴⁴⁶ An Auckland resident also responded by citing successful treatment by the hyperphoric plant in London of ore from several countries.⁴⁴⁷

Jackson replied that the shareholders wanted information as soon as possible and entreated Campbell, 'for his own reputation, to bring the transaction to a close as speedily as possible'.⁴⁴⁸ Nothing more was heard, prompting 'Investor' nine months later to ask the directors to publish the results, for he had become a shareholder on the basis of Campbell's assurances.⁴⁴⁹ This letter prompted a reporter to visit the company's secretary, who informed him 'that an interim report, containing very little information, had been received' from Campbell, 'but no detailed or complete report as to results obtained was yet to hand'.⁴⁵⁰ Campbell responded, 'with considerable surprise, mingled with some annoyance', that he had sent a

⁴⁴⁵ Letter from Joshua Jackson, *New Zealand Herald*, 16 December 1898, p. 6.

⁴⁴⁶ Letter from Joseph Campbell, *New Zealand Herald*, 20 December 1898, p. 6.

⁴⁴⁷ Letter from A.E. Burcher, *New Zealand Herald*, 20 December 1898, p. 6.

⁴⁴⁸ Letter from Joshua Jackson, *New Zealand Herald*, 21 December 1898, p. 6.

⁴⁴⁹ Letter from 'Investor', *New Zealand Herald*, 2 October 1899, p. 6.

⁴⁵⁰ *New Zealand Herald*, 2 October 1899, p. 6.

four-page report 10 January, in which he had yet again promised 80 per cent extraction, with the likelihood of 95 per cent.⁴⁵¹

This report was then published, revealing the assay value of the ore to be £5 2s 2d, not £10 as Campbell had been led to expect. 'At times during the running, when the greatest care was exercised, the extraction was 80 per cent of the value', but at other times it was only 50 per cent or even a little lower. He had been hampered by the grinding and amalgamating mill crushing the ore too finely, and Hey's presence had prevented him, for unexplained reasons, being in attendance during most of the treatment, 'though I knew I was losing 25 per cent that I might easily have saved'. £93-worth of bullion was obtained from 35 tons, and he had 'concentrated tailings of the value of £20' which would be extracted 'on resumption of operations'. He concluded by guaranteeing to extract '80 per cent, probably reaching 90 to 95, at a cost not exceeding 12s per ton',⁴⁵² a much higher figure than previously quoted.

William Douthwaite Holgate, chairman of directors, was asked for his opinion. Holgate, who had arrived in Auckland from Melbourne in 1890, from 1879 onwards had 'speculated successfully in mining stocks and land', especially coal mines.⁴⁵³ He had opposed sending ore to Campbell but had been over-ruled by his fellow directors. Campbell's report did not provide the details requested about the results and the amount of bullion extracted:

I may also add that Mr Campbell attended the Board meeting at which his letter was received, and in answer to questions, stated that he had crushed a certain quantity of the ore, concentrated about 10 tons only by a Union concentrator, and the concentrates he had, or intended to ship to Sydney for treatment, admitting that he had not used the thermo-hyperphoric process. I cannot say how the concentrates were treated, or whether he actually sent them or not, as he has not favoured the Board with any further information. Some shareholders may think the directors remiss in not insisting upon a full and detailed report, but I am under the impression that my co-directors were convinced that they had made a mistake in letting Mr Campbell have the ore, and so let the matter drop. Mr Campbell states in his letter that the ore was very disappointing, as it only assayed £5 2s per ton. I may state these assays do not compare with bulk assays made of

⁴⁵¹ Letter from Joseph Campbell, *New Zealand Herald*, 4 October 1899, p. 6.

⁴⁵² *New Zealand Herald*, 6 October 1899, p. 6.

⁴⁵³ See *Cyclopedia of New Zealand*, vol. 2, p. 165; *New Zealand Herald*, 21 August 1939, p. 11; Probate, BBAE 1570, P695/1939, ANZ-A.

the ore by the Otago syndicate, who broke out same, copy of which I am prepared to furnish.⁴⁵⁴

Campbell responded that Holgate's explanation was 'very absurd' and that 'people who send ore to me or ask me for an opinion get the plain truth, and this is not always acceptable to mining men. Apparently it is so in this instance'. His process could extract nearly all the bullion, 'but does not put bullion in where such does not exist'. He insisted that his assays, taken in the present of one of the directors, were accurate, whereas those made by the Otago syndicate were 'very deceptive'. While 'it may have been very liberal on the part of the directors to give me 40 tons of ore', it had cost him 'nearly £100 to get it to the works, apart from the cost of treatment'. He did not reply to the charge that he had not used his process, merely repeating that it worked if there was value in the ore. If the company sent him, at its expense, 50 tons of ore valued at £10, he would guarantee 80 per cent extraction by his process at 20s per ton, an even higher cost than previously quoted. Alternatively, he would

guarantee a 95 per cent extraction 50 per cent cheaper than any other process that can be shown to extract a similar percentage from an equal quantity of ore. I can make no fairer offer, for all the risk is on my side. Two years' hard, and, I may add, unsympathetic, work, among your New Zealand refractory ores has put me in the position to state positively and emphatically, without fear of contradiction, that I can successfully deal with any of them.⁴⁵⁵

This was not answering the question. But, as 'Investor' wrote in response to the publication of Campbell's report, it was not the value of the ore that concerned him, but

how many tons were hyperphorically treated in 24 hours; by what means the bullion was subsequently recovered; how much bullion was extracted, and at what cost per ton. In the interest of local and Australian gentlemen, men of means, having invested and still yearning to invest, fired by the glowing reports of past success furnished by Mr Campbell, both by press and public utterance - in their interest as well as that of the colony

⁴⁵⁴ *New Zealand Herald*, 6 October 1899, p. 6.

⁴⁵⁵ Letter from Joseph Campbell, *New Zealand Herald*, 9 October 1899, p. 6.

generally, this matter should be investigated to the minutest detail.⁴⁵⁶

Although this pointed peroration did not provoke Campbell into replying, 'Shareholder' responded because he had taken 'much interest' in what was revealed by the correspondence.

The word "failure" describes so far the result of his system of treatment. Mining men in such matters go by results, and where a return of £93 is obtained from ore assaying in bulk as worth £184 8s, there can be no doubt the process has proved a failure. Mr Campbell's report is full of excuses, and most unsatisfactory. He enlarges theoretically upon what he can do, but in practice fails entirely in producing satisfactory results.

It was 'unaccountable' that Campbell was still promising such excellent results, which clearly showed he was 'convinced that theoretically he is right'. He urged the directors 'to steer clear of theorists and unsuccessful systems' in future.⁴⁵⁷

Once more, Campbell remained uncharacteristically silent. However, the following month he did provide details of how he treated ore from the Broken Hill mine at Waiomu. After treating seven and a half pounds of ore by his process for three hours, he concentrated and smelted it, saving 80 percent of the assay value. Yet again, he assured the directors that 'a saving of from 90 per cent to 95 per cent of the raw value' could be 'effected at a cost of not more than 12s per ton'. He guaranteed 'a saving of 80 per cent from a parcel of 100 tons at a cost of 12s per ton', provided he could 'keep all over and above 80 per cent in return for my labour'.⁴⁵⁸ His offer was not taken up.

A NEW COMPANY REPLACES THE OLD

In 1932, Campbell claimed that the shareholders decided to give up when 'the Montezuma ore cut out - only temporarily I believe'. This company 'was a small one of £10,000, and the shareholders lost heart when funds were exhausted and further prospecting at Montezuma could not be

⁴⁵⁶ Letter from 'Investor', *New Zealand Herald*, 9 October 1899, p. 6.

⁴⁵⁷ Letter from 'Shareholder', *New Zealand Herald*, 16 October 1899, p. 3.

⁴⁵⁸ *Auckland Weekly News*, 10 November 1899, p. 21.

carried on'.⁴⁵⁹ This was a deliberately misleading statement, for he could hardly have forgotten that the nominal capital was three times that amount and not all had been expended. On 23 February 1899, shareholders resolved that 'the Company cannot continue its business', and appointed a liquidator.⁴⁶⁰ The *Ohinemuri Gazette* reported, no doubt on the basis of information provided by Campbell, that 'most of the original colonial shareholders, being in a position to judge the real value of the property', had decided to purchase its assets and form a new company.⁴⁶¹ In December 1898 there had been seven Sydney shareholders with a total holding of 3,500 shares; four 'gentlemen', one manufacturer, one woman, and the Bishop of Sydney. Campbell may have included the four residents of India under the 'colonial' heading, along with himself and the two other New Zealand shareholders.⁴⁶² In April, Campbell informed George Wilson that the liquidation was

owing to differences of opinion between the managing director and the company's representative director sent out from London to report on the property. Although his estimate of the value of ore was £1 10s to £1 16s per ton, bulk assays giving £2 16s, he condemned the property, and the company declined to subscribe an additional sum of £3,000, required for further developing the property and completing the plant, when it was decided to go into liquidation. The whole concern was purchased by the New South Wales shareholders, who did not agree with the action of the London directorate, and the necessary work is now being carried out under the direction and personal supervision of the Rev. Joseph Campbell, who is satisfied, after the full test made with various classes of ore, that from 80 to 95 per cent. of the value of any refractory ore in New Zealand can be saved by his thermo-hyperphoric system. In three months everything will be ready for a start under the new company, which is styled "The Twentieth-Century Gold-mining Company (Limited)."⁴⁶³

⁴⁵⁹ Joseph Campbell to Charles Scott, 25 May 1932, Mines Department, MD 1, 23/1/20, Part 1, ANZ-W.

⁴⁶⁰ Resolution passed on 23 February 1899, confirmed on 7 March 1899, Company Files, BT 31/7207/50975, The National Archives, Kew, London; the date was given as 20 February in Te Aroha Warden's Court, Plaints 19/1900, BBAV 11572/2a, ANZ-A.

⁴⁶¹ *Ohinemuri Gazette*, 11 March 1899, p. 5.

⁴⁶² Company Files, BT 31/7207/50975, The National Archives, Kew, London.

⁴⁶³ Joseph Campbell to George Wilson, 10 April 1899, printed in *AJHR*, 1899, C-3, p. 69.

As this company was a private one, its records have not survived. The warden, Robert Smelt Bush, was told that the New South Wales shareholders intended ‘vigorously conducting further experiments’ under Campbell’s ‘personal supervision’.⁴⁶⁴ (If the process was the success he claimed, why was more experimentation needed?) The main shareholder was Raymond Lhoest, a Sydney woolbroker and manufacturer.⁴⁶⁵ He had previously applied for the Ajax and Ajax Extended Special Claims near Te Aroha in August 1896, almost 179 acres, which were granted the following February.⁴⁶⁶ In December 1898 he held 850 shares in the Montezuma Company.⁴⁶⁷ On 8 May 1899, Campbell as his attorney transferred its mines, tramway, water race, machine site with buildings, and residence sites to him as the new company’s agent; the price was a mere £1,200.⁴⁶⁸

In March, excavation started for a concentrating plant, and a contract was let to break out a ‘considerable body of ore’ from the Grand Result, for a test of 20 tons had proved it could be profitably treated by Campbell’s process. The best of the ore would treated, along with ore from Tui.⁴⁶⁹ By May, ‘certain additions’ had been made to the plant; it was claimed it had been proved that ‘the low-grade refractory ores of the district yielding about £2 per ton’ could be ‘very profitably handled’ and that the process gave larger returns than any other. Once the additions were completed ‘large parcels’ would be treated. As the best results were expected to come from ‘the Plutus or north end’ of the field, arrangements were being made ‘for breaking large supplies’, and work would commence in a month.⁴⁷⁰ When that time expired, it was promised to start in another month’s time. Campbell announced that the company had ‘retained only the most

⁴⁶⁴ R.S. Bush to Under-Secretary, Mines Department, 3 July 1899, *AJHR*, 1899, C-3A, p. 8.

⁴⁶⁵ E.W. Cave to Raymond Lhoest, 10 November 1900, Te Aroha Warden’s Court, Letterbook 1883-1900, p. 589, BBAV 11534/1a, ANZ-A; Company Files, BT 31/7207/50975, The National Archives, Kew, London.

⁴⁶⁶ Te Aroha Warden’s Court, Applications for Special Claims 1895-1899, 29, 30/1896, BBAV 11582/4a, ANZ-A; *AJHR*, 1897, C-3, p. 98.

⁴⁶⁷ Company Files, BT 31/7207/50975, The National Archives, Kew, London.

⁴⁶⁸ Te Aroha Warden’s Court, Numerical Index of Registrations 1889-1912, entry for 8 May 1899, BBAV 11289/2a; Mining Registrations 1896-1903, 15/1899, BCDG 11288/1a, ANZ-A.

⁴⁶⁹ *Thames Advertiser*, 27 March 1899, p. 2, 10 May 1899, p. 3; *Thames Star*, 27 March 1899, p. 4.

⁴⁷⁰ *New Zealand Herald*, 12 May 1899, Supplement, p. 2.

promising mines', and would mine and treat quartz for others 'on a percentage basis, the proprietors of the properties receiving 10 per cent on the amount of bullion extracted'. Only about 18 tons would be treated daily, but 'when additional tables were erected' this amount would be doubled.⁴⁷¹

In 1922, Campbell wrote that 'the complex ores sent from all parts of the Auckland goldfields, and which had to be analysed before treatment, rendered the laboratory work very arduous; but, with my assistants, I did it all, as well as directing the furnace work and milling and superintending the developments of the mines'.⁴⁷² He refrained from claiming success, but did cite a statement by the Professor of Chemistry at Auckland University College, Frederick Douglas Brown, who carefully refrained from stating that he had succeeded:

I have been much impressed by the energy and enthusiasm which he has constantly exhibited, fearlessly attacking every difficulty, and sparing neither thought nor time in order to arrive at a successful issue. This faculty of enthusiastic work, coupled as it is in Mr Campbell's case with a genuine love of communicating his knowledge to others, constitutes, in my opinion, the most valuable qualification of a teacher.⁴⁷³

In late July, the *Observer* recorded Campbell's announcement, at a meeting of the parishioners of St Sepulchre's in Auckland, that

he would have to leave them for a short time to go to Sydney on "urgent business." But it turns out that the urgent business is of a "capital" idea from Te Aroha, which is in the process of reduction to a practical use, and that the treasure will be laid up, as per usual, where moth and dust doth corrupt.⁴⁷⁴

Meaning that he was seeking more capital in Sydney. He took examples of concentrates which were 'spoken of as highly remunerative'; the plant would continue to operate in his absence under the direction of several of the workers,⁴⁷⁵ in particular James Eager, who had 'been

⁴⁷¹ *New Zealand Herald*, 9 June 1899, Supplement, p. 1.

⁴⁷² Campbell, *Autobiographical Sketch*, [p. 14].

⁴⁷³ Frederick Douglas Brown, n.d., printed in Campbell, *Autobiographical Sketch*, [pp. 13-14].

⁴⁷⁴ *Observer*, 29 July 1899, p. 7.

⁴⁷⁵ *Thames Advertiser*, 24 July 1899, p. 2.

connected with the works from the start, and thoroughly understands his business'.⁴⁷⁶ (Eager's abilities are unknown, but he would be employed by the Waihi Company at its Waikino battery from February 1900 to July 1901; in 1902 he was found guilty of stealing gold slimes and shavings.)⁴⁷⁷

Over several weeks, Campbell gave well-attended public lectures in Sydney, entitled 'Two Years in New Zealand', illustrated by 80 limelight views of the scenery.⁴⁷⁸ He was introduced by the chairman, a Member of the Legislative Council, as 'an ardent student of geology, a keen observer, and one who took a deep interest in the practical education of the public'. After dealing with 'the wonderful natural beauties of New Zealand' and describing its flora and fauna and Maori customs, he dealt 'more comprehensively' with its minerals. Once again he proclaimed that his treatment 'could be used with considerable success', and his 'lantern pictures' included 'some very interesting views' of the machinery he used to treat refractory ore for, he claimed, 8s per ton.⁴⁷⁹ On one occasion he gave details of the Te Aroha ores which no previous method could treat:

Mr Campbell was induced to take the matter in hand, because he concluded that if he could deal successfully with these ores he could treat anything in the mineral world. He had an extensive plant erected under his personal direction at Te Aroha, and after meeting and overcoming difficulty after difficulty, at last succeeded in extracting over 80 per cent by the water-gas treatment.

When he added 'some Frue vanners, or ore concentrators', the result, 'he confidently asserts, will give very large profits to the syndicate'.⁴⁸⁰ (It should be noted that, in his earlier experiments as well as in this modification, there was no indication he received any assistance from the many English scientists whom he had claimed were eager to assist him improve his process.)⁴⁸¹

While Campbell was in Sydney, further excavations were made alongside the existing plant ready for installing additional machinery on his

⁴⁷⁶ *Thames Advertiser*, 16 August 1899, p. 3.

⁴⁷⁷ *Ohinemuri Gazette*, 13 August 1902, p. 2, 15 August 1902, p. 2.

⁴⁷⁸ *Auckland Weekly News*, 18 August 1899, p. 18; *Thames Advertiser*, 23 August 1899, p. 3.

⁴⁷⁹ *Thames Star*, 23 August 1899, p. 4.

⁴⁸⁰ *Auckland Weekly News*, 18 August 1899, p. 13.

⁴⁸¹ *Auckland Weekly News*, 1 May 1897, p. 20.

return.⁴⁸² In late August he was reported to be returning with sufficient capital to make ‘substantial additions’ and improvements.⁴⁸³ One month later, ‘an Auckland syndicate’ was reportedly planning to take up some properties and might approach Campbell to see whether his process would deal with the refractory ore;⁴⁸⁴ nothing came of this possibility. The following January the *Te Aroha News* reported his plant had resumed operations.⁴⁸⁵ A month later it responded to readers’ questions.

We are often asked, “What is the Rev. J. Campbell doing?” “Will his process work - and how are his claims?” Well, as the Company referred to is of an entirely private nature we are unable to supply the information desired. All we can say is that the Rev. Gentleman has the fullest confidence in his process, and it will not be his fault if things fail to pan out trumps.⁴⁸⁶

FAILURE ADMITTED

Late in February 1900, when lecturing at the Waihi School of Mines about his three years of experiments, Campbell first publicly admitted not overcoming all his difficulties because Te Aroha ores were ‘too low grade to be worked with financial success unless local fluxes could be effectively employed’. Ore ‘containing from 12s 6d to 15s per ton worth of silver with a trifling quantity of gold was too poor to warrant the use of imported fluxes, and so far his attempts with local fluxes had not been entirely successful, and his hopes of their ultimate success was not strong’.⁴⁸⁷ One week later, he informed the *Te Aroha News*, which had reported these uncharacteristically pessimistic explanations,⁴⁸⁸ that since giving this lecture his tests with local fluxes had been ‘crowned with success; and had it not been for a severe mishap to the smelter by which it was rendered useless, he would have ere this treated a large parcel of concentrates’. He was about to test a modified smelter in Auckland which operated much more cheaply than his, and, should it be satisfactory, he would smelt

⁴⁸² *Thames Advertiser*, 16 August 1899, p. 3.

⁴⁸³ *Thames Advertiser*, 25 August 1899, p. 2.

⁴⁸⁴ *New Zealand Herald*, 29 September 1899, Supplement, p. 1.

⁴⁸⁵ *Te Aroha News*, 11 January 1900, p. 2.

⁴⁸⁶ *Te Aroha News*, 15 February 1900, p. 2.

⁴⁸⁷ *Thames Star*, 23 February 1900, p. 4.

⁴⁸⁸ *Te Aroha News*, 24 February 1900, p. 2.

whatever was offered to him. 'Everything has been done to place a perfect plant in this district, and it would not be closed down' unless payable ore was unobtainable.⁴⁸⁹ Nearly three weeks later, he informed the newspaper that whereas 'the bulk' of the local refractory ores were 'not worth handling by his process', ore assaying over 30s per ton could be successfully treated. He had been

trying to devise a cheap method of smelting concentrates from such ores after treatment, and he yesterday proved that he has been successful, as he extracted 99 per cent from concentrates assaying £5 per ton, by means of a cheap form of smelter he has arranged, and the use of local fluxes.... The process is a decided success in all cases where there is any value in the ore, and it now remains for owners of mines to show that they ores contain value.⁴⁹⁰

In a cautiously worded paragraph, Warden Bush reported that Campbell had

not as yet met with great success in thermo-hyperphoric experiments, but latterly has turned his attention to dealings with local fluxes. He now claims to have made a most important discovery in the form of a method of smelting refractory concentrates quite new to metallurgical science. By this process he considers the cost of treating refractory concentrates will be largely reduced, so that more may be heard of it during the coming year.⁴⁹¹

More was, but of a much less sensational nature. Late in June, it was reported that 'after three years of patient investigation', Campbell had concluded that there was

no refractory ore problem in New Zealand to be solved, inasmuch as the quantity of payable ore that is not amenable to cyanidation, or that may be concentrated is very limited, and merely occurs in patches that are not worth working. Though the plant he has erected is complete in every particular for dealing with any class of ore, either free milling or refractory, experience shows that none is obtainable in the district, and he has, therefore, decided very unwilling to close down the plant and offer

⁴⁸⁹ *Te Aroha News*, 1 March 1900, p. 2.

⁴⁹⁰ *Te Aroha News*, 17 March 1900, p. 2.

⁴⁹¹ Warden to Under-Secretary, Mines Department, 25 May 1900, *AJHR*, 1900, C-3, p. 117.

all the valuable machinery and comfortable bungalow he erected for private sale.⁴⁹²

Shortly afterwards, the following was printed in Auckland:

The Rev. Joseph Campbell, who is leaving Auckland for the South, has furnished us with the results of his three years' work. Being persuaded that an abundance of refractory ore existed here, he came over, and made a cursory examination, which seemed to justify the statement. Then he visited Cripple Creek, with a view of comparing the formation, the result being that the probability of the existence of the said bulk of refractory ores was strengthened, and consequently a plant, involving an expenditure up to the present of £15,000, was erected. Mr Campbell has devoted most of his time during the three years to extracting parcels of ore, and treating them by his hyperphoric process, the results in all cases being satisfactory where the value was contained in the ore, but, unfortunately, the difficulty has been to obtain any quantity of this ore. The various parts that have been tried proved patchy, although very promising at the face at times. Mr Campbell has come to the conclusion that with the exception of the ores that can be treated by cyanide and concentration, there is not enough ore in this country to keep the plant going up to its capacity, which is from 30 to 40 tons per day. Hence he has decided to dismantle it.

After explaining his experiments with gas for heating and lighting and in preparing white lead, he turned to another of his discoveries:

A third most important matter is the discovery of a cheap method of smelting ore concentrates, such as are, or may be, produced from the Waihi mines or Waiomu, and other similar reefs. He had put through small parcels from these places with very satisfactory results, the best being obtained after having first subjected the ore to a partial treatment by the thermo-hyperphoric process, which seems to give a larger saving of the bullion. This treatment only costs about 30s per ton. It is Mr Campbell's intention to communicate his labours to one of the scientific journals in the Old Country, but he thought the information afforded here would be interesting to the public at this juncture, and he will be very happy to furnish fuller particulars to anyone who may be interested.⁴⁹³

⁴⁹² *Auckland Weekly News*, 29 June 1900, p. 42.

⁴⁹³ *Auckland Weekly News*, 6 July 1900, p. 40; abbreviated version in *New Zealand Herald*, 6 July 1900, Supplement, p. 1.

In other words, all his experiments succeeded, his process worked, and any failure was the fault of the ore. He now admitted to having only superficially checked the ore when first visiting, whereas at the time he claimed to have made a thorough geological survey.⁴⁹⁴ He also admitted having spent months being diverted from perfecting his process by experimenting with manufacturing illuminating gas, white lead, and a new method of smelting, none of which produced any practical outcome. No article that he wrote for a British scientific journal subsequent to this date has been traced, nor did he publish any information in New Zealand. He never announced what happened to the Sydney company that had taken over the mines; clearly it had collapsed.

At his farewell social at St Mark's, Te Aroha, according to a correspondent Campbell regretted that 'he had experienced great disappointment in his mining venture' and stated that the district had no 'mining attractions':

The ore in the hills in the immediate vicinity of Te Aroha has proved too complex and refractory but he thought better things could reasonably be expected from Waiorongomai. During his stay in Te Aroha he had given an immense amount of labour and study to the solution of the problem, but it had proved too much for him. One result was that he could now safely assert, that what he did not know about refractory ores was not worth knowing.⁴⁹⁵

Upon reading this report, Campbell immediately denied saying that finding a 'solution of the problem of dealing with refractory ores had proved too much' for him. 'I said that the examination and testing of the ores in bulk had proved their non-payable character. As a matter of fact, there is no refractory ore in the North Island that cannot be profitably handled if it yields 35s per ton, and can be cheaply mined'.⁴⁹⁶ Once again, the process worked and the ore was the problem. Another newspaper's fuller account of this farewell speech did not include the phrase 'it had proved too much for him'. He had thought there was 'a lot of gold and silver' in the hills, but as he knew the problem of extracting the gold 'would be hard to solve', he had

⁴⁹⁴ *Auckland Star*, 28 September 1896, p. 2.

⁴⁹⁵ Te Aroha Correspondent, *New Zealand Herald*, 31 July 1900, p. 6.

⁴⁹⁶ Letter from Joseph Campbell, *New Zealand Herald*, 2 August 1900, p. 3.

spent 20 years trying 'to work out these problems. I came to help the miners to work these reefs, and after struggling these three years I was forced to give in. I believe Waiorongomai will pay to work. The real goldfield lies in your Domain' He would encourage people to visit the baths, 'but if anyone asks me about gold and silver I will say, don't touch it'.⁴⁹⁷

CRITICISM AND DEFENCE

The *Observer*, hearing of Campbell telling an Auckland congregation that 'his unsuccessful mining ventures at Te Aroha had not been undertaken with the desire to enrich himself, but to obtain a knowledge of minerals and to study nature', responded crushingly:

Rats! But let us assume, for the sake of argument, that this is so. Did the Rev. Joseph Campbell tell the Home financiers, when he was raising money from them to exploit the Te Aroha mines, that the purpose was to study nature? Also, when he took up options over certain mines, was it with the object of studying nature? Nonsense. Rev. Joseph Campbell does not require to study nature. He knows it too thoroughly - especially human nature.⁴⁹⁸

'Mercurio', noting that Campbell's text for his valedictory sermon in Auckland was: 'Go thy way for this time, when I have a convenient season I will call for thee', commented that, after 'the lurid description' he gave of the non-payable character of the ores, it was 'scarcely likely' that mine managers would call for him:

Mr Campbell was not always in this pessimistic mood, for if my memory serves me rightly, he staggered some of the sharebrokers of the Mining Exchange, by taking up his his parable one Sunday evening at St. Paul's, at the commencement of the mining boom, from the text in Psalm lxxviii. 13, "Though ye have lien among the pots, yet shall ye be as the wings of a dove covered with silver, and her feathers with yellow gold." Considering that some of them before the boom had scarcely a feather to fly with, the change predicted rather tickled them, and they accepted it as "the straight tip." From "feathers with yellow gold" to non-payable refractory ore, and reduction works for sale, is "a far cry."⁴⁹⁹

⁴⁹⁷ *Auckland Star*, 1 August 1900, p. 2.

⁴⁹⁸ *Observer*, 10 February 1900, p. 7.

⁴⁹⁹ 'Mercurio', 'Local Gossip', *New Zealand Herald*, 7 July 1900, Supplement, p. 1.

The following week, ‘Mercurio’ reported that a reader had corrected him: Campbell did not use this or any other text from the Book of Psalms in any of the 26 sermons he preached at St Paul’s. ‘Mercurio’ protested that he could

see nothing derogatory to Mr Campbell in imagining the possibility of his preaching from such a text, because from what I have seen of the rev. gentleman’s versatility and ability, I have no doubt he could preach an excellent and instructive discourse from such a passage.⁵⁰⁰

Campbell’s response was to claim he had ‘read with some amusement’ the first comment about his texts, for ‘Mercurio’ had ‘several times amused himself, and I will say many of his readers, by throwing at me his balls of wit’, which he did not mind so long as the honour of the church was not impugned. ‘My motto is the motto of the Romans, “I am a man, and whatsoever concerns men concerns me”’. Clergymen should mix with their fellow men, for they were ‘men first and clergymen after’. During his time in the Auckland province he had ‘spent much and laboured much’, but ‘received naught at the hands of the Aucklanders except - but it is a great exception - a few fast friendships. I cost them nothing, and I asked nothing of them, but I feel I have done all that I could do up there’. As ‘they neither require scientists nor clergymen - at least, so it seems’, he was glad to have moved to the South Island:

I was a few years ahead of the time up there, but I think the convenient season may yet come when they will call for me. My personal experience of Auckland is fittingly summed up in the words of Heine, which inculcate the duty of self-help, which I preach and try to practise:

They gave me advice and counsel in store,
Praised me and honoured me more and more
Said that I only should wait awhile,
Offer’d their patronage, too, with a smile,
But with all honour and approbation
I should long ago have died of starvation,
Had there not come an excellent man,
Who bravely to help me at once began.
Good fellow! he got me the food I ate,

⁵⁰⁰ ‘Mercurio’, ‘Local Gossip’, *New Zealand Herald*, 14 July 1900, Supplement, p. 1.

His kindness, and care I shall never forget.
 I cannot embrace him, tho' other folk can,
 For I myself am that excellent man.⁵⁰¹

'Anti-Gas (Hyperphoric or Otherwise)', an Aucklander, responded to his comment that Auckland needed neither clergymen nor scientists. Writing as 'a man intimately connected with practical mining', he claimed that 'scientists of Mr Campbell's stamp' were 'certainly not wanted'. He thought Campbell should 'prove his claim to the title of scientist': if by that term he meant metallurgist, for his 'scientific knowledge has been confined to treatment of ores', there were far better scientists amongst the superintendents of the leading batteries.

The following is a brief sketch of Mr Campbell's career as a scientist in Auckland: --- Some time ago he arrived in the colony and proceeded to inform us that he had a process with which he could treat poor and refractory ores at a substantial profit. He gave figures as regards working costs, and kindly explained the whole of his process, the main features of which, I may inform you, are in no way new nor the invention of Mr Campbell. At Te Aroha, when Mr Campbell elected to operate, he had a superabundance of poor refractory ore, and he spent many thousands of pounds in the erection of reduction works, designed on lines altogether peculiar to the scientist, to treat the material. These have been in operation for a considerable time, and what has been the practical result? Absolutely nothing! He has advertised himself to the utmost extent during his experiment at Te Aroha in the press, at lectures, in church rooms, in private life, and even from the pulpit; but to a practical mining man the plain facts of the case are that, notwithstanding the overweening self-confidence displayed by him upon every occasion, his process as regards Te Aroha mines (which mines he deliberately selected for experiment after, I presume, carefully examining same) is a dead failure.

In these circumstances, I think we can all agree with Mr Campbell that if he is a scientist we do not want scientists in Auckland, and that he will probably save money to unfortunate shareholders if he confines himself to the clerical half of his two-sided profession, and leaves mining to practical men.⁵⁰²

⁵⁰¹ Letter from Joseph Campbell, *Ashburton Guardian*, 18 July 1900, reprinted in 'Mercurio', 'Local Gossip', *Auckland Weekly News*, 28 July 1900, Supplement, p. 1.

⁵⁰² Letter from 'Anti-Gas (Hyperphoric or Otherwise)', *New Zealand Herald*, 6 August 1900, p. 7.

Campbell ignored what he said was his usual policy of ignoring anonymous correspondents by responding:

“An enemy has done this.” I know I have my enemies, as every man has who tries to put down wrong-doing, but this personal attack is most unjust, and betrays sad ignorance. There is, of course, no need for me to establish my claim either to the title scientist or clergyman. My parchments show that, apart from 20 years’ active work of which “Anti-gas” appears to know nothing save re one branch, which has occupied a portion of my three years’ sojourn in New Zealand. A wiser man than “Anti-gas” once said, “There is no new thing under the sun,” and all I claim is to have wrested from nature some of the secrets which have been hidden for years; but, strangely enough, when put side by side with “Anti-gas’ ” statement, sounds [like] that of Professor Roberts Austen, F.R.S., one of England’s leading scientists, Professor of Metallurgy in the Royal School of Mines, that the hyperphoric treatment was new to him. So also said Professor Christie, of the Mining Department, Berkeley College, California, and other prominent scientists. Regarding my statement that clergymen and scientists are not required in Auckland province, I repeat it; though, in order that I may not be misunderstood, I will say more clergymen and scientists are not required. Nothing was further from my thoughts than to speak slightly of the clergy or scientists there already, for some of whom I have a very high regard. But if “Anti-gas” will consult the university lists he will see that most of the distinguished students in science go abroad. Why? Because there is no scope for their energies in their own country. I could not, therefore, hope there would be room for me, a stranger, though I should like to have stayed a little longer in the North, and should have done so if there had been any problems of a practical nature for me to solve, for I merely claim to be a practical scientist. All my work has been done because I chose to do it. It has not cost Auckland people anything, excepting one man, who was willing to do more than talk. Therefore they have no cause to complain. As to the ungenerous remarks of “Anti-gas” in the latter part of his letter, I will only say that when a man is quite sure of his ground he is naturally confident, and I am willing to prove every statement I have made in public, and I am proud to have fought a hard battle, a battle from which I have come wounded, but they are honourable wounds, and if “Anti-gas” was a true man he would desire rather to heal those wounds than to keep them open. He lacks charity, and that is the estimate my numerous friends have formed concerning him. It is not my fault that there has yet been no refractory ore worth treating discovered in Auckland province; but it certainly has been my

misfortune. Legitimate mining has my best wishes, and I repeat my words of advice uttered in my lecture in the City Hall on November 15, 1897, "Be as businesslike in mining as you would be in manufacturing or in farming. Deliver mining from the degradation of a mere gamble, or at least a risky speculation, and elevate it to a sound commercial basis."

Men who will do this are welcome to any knowledge that I possess, and I shall esteem it a privilege to help them; but mining scamps and tricky brokers will certainly not want me in Auckland.⁵⁰³

In 1903, Campbell explained that 'as the major part' of the Te Aroha ore assayed 'at less than 20s per ton, they cannot be profitably handled'. During his 'elaborate series of experiments' he had 'discovered a simple, cheap, and effective method of smelting concentrates. This still remains a secret, but will be made known when the handling of payable concentrates renders it necessary'.⁵⁰⁴ (It remained a secret.) One year before he died, he wrote to Charles Scott, who was attempting to revive mining at Te Aroha,⁵⁰⁵ thanking him for news about local mining. 'But how strange it is that you should not be familiar with my operations there 34 years ago - Can it be I am absolutely forgotten?' He assumed older residents must remember his process.

Tho' I successfully demonstrated the process and saved 95% of contents of all ores sent to me, I had to close down the Works because of the lack of quantity of ore available.... It was quite the fault of the people that my work then ceased, because I had given up my time and spent much money in fully demonstrating my ability to extract 95% of the value of any 5 or 10 ton lots sent to me from various Localities; but they only made use of what I did for them for the purpose of floating their particular properties, and as the Montezuma ore cut out - only temporarily I believe - I was obliged to give up my work to which I had devoted so much time and Energy.⁵⁰⁶

Which was neither accurate nor charitable to those whose money he had spent. Campbell's letter implied that his own money was used, but this

⁵⁰³ Letter from Joseph Campbell, *New Zealand Herald*, 20 August 1900, p. 7.

⁵⁰⁴ *Cyclopedia of New Zealand*, vol. 3, p. 195.

⁵⁰⁵ See paper on prospectors and investors in the Te Aroha Mining District in the 1930s.

⁵⁰⁶ Joseph Campbell to Charles Scott, 25 May 1932, Mines Department, MD 1, 23/1/20, Part 1, ANZ-W.

was not the case, all his costs, including building his comfortable ten-roomed residence, being met by the company.⁵⁰⁷ When sold in 1900, the reserve sale price was £470.⁵⁰⁸ Despite his claim to have saved 95 per cent, at the time he claimed lower figures for both Te Aroha and Great Barrier Island ore.⁵⁰⁹ Campbell's letter gave no indication that he had used his process in Australia, where it also failed. As for the older residents' memories of him, they may well have agreed with the June 1901 comment in the *Thames Star* that Campbell's plant, 'which was to have revolutionized Te Aroha mining, has long since departed, and (appropriately enough) is now said to form part of a gas works'.⁵¹⁰

LEAVING TE AROHA

When Campbell left Te Aroha, he presented a 'very valuable' collection of fossils and minerals to the Waihi School of Mines and a 'useful collection of minerals' to Auckland University College.⁵¹¹ He also left without paying the rent owing on his eight mining claims, prompting the *Observer* to write that he 'would like a big slice of this world, at any rate'.⁵¹² In July 1900 Campbell was warned that he would be sued unless the 'large sum' owing was paid.⁵¹³ Campbell considered he should not be required to pay this amount, £538, because the claims had been abandoned.⁵¹⁴ This argument was only partly accepted, for proceedings were taken, the claims were forfeited, and he was ordered to pay £95 4s 6d in rent and legal costs.⁵¹⁵ Campbell responded by asking the Piako and Ohinemuri councils to treat

⁵⁰⁷ *Thames Advertiser*, 12 August 1897, p. 3, Te Aroha Magistrate's Court, 15 June 1899, p. 3; *Ohinemuri Gazette*, 14 July 1900, p. 2.

⁵⁰⁸ *Auckland Star*, 30 July 1900, p. 6.

⁵⁰⁹ For Te Aroha, see *Auckland Weekly News*, 23 July 1898, p. 20; for Great Barrier Island, see *New Zealand Herald*, 4 October 1899, p. 6, 6 October 1899, p. 6.

⁵¹⁰ *Thames Star*, 12 June 1901, p. 4.

⁵¹¹ *Thames Star*, 2 March 1900, p. 2, 15 December 1900, p. 1; *Auckland Weekly News*, 18 May 1900, p. 32, 6 July 1900, p. 40.

⁵¹² *Observer*, 15 September 1900, p. 3.

⁵¹³ E.W. Cave (Receiver of Gold Revenue) to Joseph Campbell, 26 July 1900, Te Aroha Warden's Court, Letterbook 1883-1900, p. 570, BBAV 11534/1a, ANZ-A.

⁵¹⁴ *New Zealand Herald*, 11 September 1900, p. 5.

⁵¹⁵ E.W. Cave to Joseph Campbell, 10 November 1900, Te Aroha Warden's Court, Letterbook 1883-1900, p. 590, BBAV 11534/1a, ANZ-A.

the rents as irrecoverable. He told the former that the judgment was ‘most inequitable to him’, as the claims ‘really belonged to a company of which he was the managing director, and it was by accident that his individual name appeared on the license form’. He had ‘really abandoned’ some without informing the registrar. ‘As his unfortunate position was largely due to his ignorance of mining law’, he asked that he not have to pay.⁵¹⁶ He told the latter that ‘he was really only attorney for a company which had spent thousands of pounds in experimental and development work’; after a long discussion, it agreed to ask the minister to remit the rent.⁵¹⁷ At its December meeting, the Piako council agreed Campbell could pay £25 instead of the £53 16s 9d owing.⁵¹⁸

Campbell then interviewed the minister, seeking to have legal costs, £21 4s, written off. In a follow-up letter to the under-secretary, he wrote that he had ‘been at terribly heavy cost over the whole thing’, implying his personal funds had been spent, and had ‘done my best for the district without any assistance from Government or County Councils and it will be a great relief to be released from this burden’.⁵¹⁹ The Mines Department, aware this was a test case, after taking legal advice informed him that the minister had no power to drop the costs, but that as the government had paid the solicitor’s fees of £16 16s he only need pay the court fees, £4 8s. The government also accepted the Piako council’s recommendation that £25 be regarded as full payment of what it was owed.⁵²⁰ Bush was less sympathetic, writing before this decision was made that Campbell

could have paid into Court the amount which probably he knew he could be compelled to pay, and contested the balance, had he done this, probably that would have been accepted, and no costs would have been incurred by us, but he elected to fight the matter out, therefore if he has to pay for it, it is his own fault. It is generally supposed that all that was done at Te Aroha was done

⁵¹⁶ Piako County Council, *Waikato Argus*, 30 November 1900, p. 4.

⁵¹⁷ *Auckland Weekly News*, 7 December 1900, p. 34.

⁵¹⁸ Piako County Council, *Waikato Argus*, 24 December 1900, p. 2.

⁵¹⁹ Joseph Campbell to Under-Secretary, Mines Department, 2 January 1901, Mines Department, MD 1, 01/3, ANZ-W.

⁵²⁰ Under-Secretary, Mines Department, to Joseph Campbell, 29 January 1901, Mines Department, MD 1, 01/3, ANZ-W; see also Under-Secretary, Mines Department, to Receiver of Gold Revenue, 15 January 1901, 29 May 1901, 6 June 1901, Te Aroha Warden’s Court, General Correspondence 1901, BBAV 11584/5f, ANZ-A.

at other people's expense. Mr Campbell should have paid the rents as they became due instead of allowing the arrears to amount to so much, or seen it done.⁵²¹

In his letter to the under-secretary, Campbell concluded, 'I have of course to pay my own Solicitor'.⁵²² After complaining to the latter that his charges, £3 15s 8d, were too high, this was reduced to £1 13s 8d.⁵²³ Eventually, the rents were treated as unrecoverable.⁵²⁴

Campbell's refusal to pay reflected his view that it was the company's responsibility, not his. As well, his personal financial resources were probably not strong. In July 1898, he stated that the Montezuma Company only met his 'actual expenses'.⁵²⁵ Like the other directors, he received no fees, and by that month he had incurred expenses of £300.⁵²⁶ However, he could afford to furnish the 'Bungalow' at Te Aroha and own a piano and organ.⁵²⁷ When leaving Te Aroha, his furniture was sold for 'good prices'.⁵²⁸ In 1923 he mentioned having had 'a small private income'.⁵²⁹

WORKING FOR THE CHURCH

⁵²¹ R.S. Bush to Under-Secretary, Mines Department, 11 January 1900, Mines Department, MD 1, 01/3, ANZ-W.

⁵²² Joseph Campbell to Under-Secretary, Mines Department, 2 January 1901, Mines Department, MD 1, 01/3, ANZ-W.

⁵²³ James Russell to Joseph Campbell, 24 October 1901, Letterbook no. 78, p. 248, Jackson and Russell Papers, MS 360, Library of the Auckland Institute and War Memorial Museum.

⁵²⁴ Under-Secretary, Mines Department, to E.W. Cave, 15 January 1901, 13 March 1901, 6 July 1901, Te Aroha Warden's Court, General Correspondence 1901, BBAV 11584/5f; Te Aroha Warden's Court, Rents Outstanding on 25 November 1904, BBAV 11289/10a, ANZ-A; Piako County Council, Minutes of Meeting of 18 September 1905; County Clerk to Minister for Mines, 25 September 1905, Piako County Council, Letterbook 1905-1906, p. 239, Matamata-Piako District Council Archives, Te Aroha.

⁵²⁵ *Auckland Weekly News*, 23 July 1898, p. 20.

⁵²⁶ *New Zealand Mines Record*, 16 July 1898, p. 525.

⁵²⁷ *Ohinemuri Gazette*, 14 February 1900, p. 3, 14 July 1900, p. 2.

⁵²⁸ *Auckland Star*, 30 July 1900, p. 6.

⁵²⁹ *Campbell's Key*, p. 17.

In February 1900, the *Observer* captioned a cartoon of Campbell: ‘Now that my mining ventures have gone astray, and I have exploited nature - scoffers would say human nature - thoroughly, I have still my surplice to fall back upon. It’s a better paying outfit than the mining expert’s khaki after all.’⁵³⁰ In reality, he had never given up his surplice. In an 1897 article announcing his departure from Australia he explained that he was resigning from his school and his ‘important work in Sydney’ because he felt that his work in New Zealand would ‘enable him to be of greater service to his fellow man’. He remained a clergyman, and would ‘from time to time help the Church in New Zealand and elsewhere, giving his services gratuitously, thus realising the dream of his college life’.⁵³¹ In 1932 he explained that, when he came to New Zealand, he was exempted from his clerical duties, ‘except for honorary work, during my efforts to advance mining’.⁵³²

In July 1897, when he settled in Te Aroha, he gave his first sermon at St Mark’s, based on a carefully chosen text (*Job*, chapter 26, verse 3): ‘Surely there is a vein for the silver, and a place for the gold when they find it’. He told the congregation that, whilst living there, he would assist the vicar.⁵³³ At the annual meeting of parishioners, when asked about building a vicarage, he said he was ‘in the unique position of being a member of a congregation for the first time in many years’. A year earlier ‘he found the late vicar comfortably situated on the hill overlooking their beautiful domain, and now he found their worthy minister dwelling in a house that to his mind was not quite what it should be’ and did not reflect well on the community and the congregation. He offered to contribute money towards building a new one.⁵³⁴

He took the Christmas services that year.⁵³⁵ The December issue of the *Church Gazette* revealed that ‘the services have been particularly well attended of late, and the offertories much larger than formerly’. Campbell had ‘given much valuable assistance to the Vicar, and his sermons have

⁵³⁰ Cartoon by ‘Blo’ [William Blomfield], *Observer*, 10 February 1900, p. 5.

⁵³¹ *Australian Mining Standard*, 15 July 1897, p. 2031.

⁵³² Joseph Campbell to Charles Scott, 25 May 1932, Mines Department, MD 1, 23/1/20, Part 1, ANZ-W.

⁵³³ *Ohinemuri Gazette*, 28 July 1897, p. 2.

⁵³⁴ *Thames Advertiser*, 26 July 1897, p. 3.

⁵³⁵ *Te Aroha News*, 8 January 1898, p. 2.

been such as will not soon be forgotten'.⁵³⁶ David Branagan, who studied his career in Australia, described him as 'a fine preacher, attracting congregations in the hundreds. His sermons were always delivered extempore from brief notes. Those which were published were usually on request and written after delivery'.⁵³⁷ In 1900, the *New Zealand Illustrated Magazine*, in a short article about people 'In the Public Eye', referred to his skill as a lecturer and preacher:

His intimate knowledge of geology assisted him materially, doubtless, in the preparation of a course of sermons which he published illustrating in a very practical manner the intimate relations between religion and science, thus explaining incontestably seeming incongruities and biblical difficulties by the aid of science. In the lecture-room Mr Campbell gave occasional glimpses of his experiences in Australian mining camps and backwoods, proving that he was equally at home in orthodox clerical garb and the humble moleskins of the bushman. To his varied experiences and intimate knowledge of life in all its phases, together with his evident belief that an occasional dash of humour is by no means out of place in the pulpit, he owes his great popularity and usefulness as a preacher.⁵³⁸

In February 1898, 'St Mark's Church was crowded to excess' when Campbell conducted a service.⁵³⁹ From March onwards he took both Sunday services, as well as services at Morrinsville, because the vicar had been sent on a sea trip to recover from a serious illness.⁵⁴⁰ To aid the vicarage funds, he gave a lecture, 'Sketches from my Travels Abroad', illustrated by 80 lantern slides selected from his extensive collection. The local newspaper encouraged attendance by describing him as 'an eloquent and persuasive preacher' who gave 'bright and cheery lectures'. He had 'seen more of the world than most men', having been in Australia, Samoa, England, America, and 'in fact throughout the Universe'.⁵⁴¹ After a piano selection performed by his wife, Campbell gave a 'chatty and descriptive accompaniment' to his

⁵³⁶ *Church Gazette*, December 1897, p. 227.

⁵³⁷ Branagan, p. 29.

⁵³⁸ 'In the Public Eye', *New Zealand Illustrated Magazine*, August 1900, p. 815.

⁵³⁹ *Te Aroha News*, 8 February 1898, p. 2.

⁵⁴⁰ *Te Aroha News*, 10 March 1898, p. 2, 12 March 1898, p. 2, 19 March 1898, p. 2; *New Zealand Graphic*, 26 March 1898, p. 386.

⁵⁴¹ *Te Aroha News*, 12 March 1898, p. 2, 22 March 1898, p. 2.

slides, yet another description of his ore treatment process and the usual sanguine forecast of the wealth to come from the local mines, and 'some reminiscences of his experiences in the Slums of London'. At the conclusion, he 'reiterated his willingness to do what he could in assisting the Church work'.⁵⁴² The local correspondent of the *Church Gazette* referred to the many ways the parish was being assisted by him, 'to whom we are indebted for so much', and 'sincerely hoped' he would remain 'for a long time'.⁵⁴³ On Good Friday Campbell used his magic lantern in the church to show paintings by Leonardo Da Vinci and others, and held a special children's service on Easter Day.⁵⁴⁴ As an example of the breadth of his interests, in April he delivered 'A Sermon from Shakespeare'.⁵⁴⁵ When the vicar returned, somewhat improved in health, Campbell continued to take one of the two Sunday services.⁵⁴⁶ His wife was the church organist.⁵⁴⁷

Campbell was soon assisting in Auckland. In July, he 'preached at St Luke's, Mount Albert, in the morning (a forcible, practical sermon), and at St Paul's in the evening'.⁵⁴⁸ By December, he had become acting vicar at St Sepulchre's during the absence through illness of Archdeacon Dudley. Campbell took the Sunday services, but as he was in Te Aroha for most of the week a curate ran the parish. He was paid from the archdeacon's stipend, although he stated in 1903 that 'he served the Church almost gratuitously' and in 1932 that all his work was honorary.⁵⁴⁹ The *Waikato Argus*, in announcing in February 1899 that Campbell would be preaching in Cambridge, stated that he attracted 'crowded congregations' at St Sepulchre's.⁵⁵⁰ He admired his Auckland parishioners because of their 'deeper spiritual life than he had seen elsewhere'.⁵⁵¹ After he returned from

⁵⁴² *Te Aroha News*, 24 March 1898, p. 2.

⁵⁴³ *Te Aroha Correspondent*, *Church Gazette*, April 1898, p. 69.

⁵⁴⁴ *Te Aroha News*, 7 April 1898, p. 2, 12 April 1898, p. 2.

⁵⁴⁵ *Te Aroha News*, 23 April 1898, p. 2.

⁵⁴⁶ *Te Aroha News*, 30 April 1898, p. 2.

⁵⁴⁷ *Auckland Star*, 1 August 1900, p. 2.

⁵⁴⁸ *New Zealand Graphic*, 2 July 1898, p. 15.

⁵⁴⁹ *Church Gazette*, December 1898, pp. 228-229; *Cyclopedia of New Zealand*, vol. 3, p. 195; Joseph Campbell to Charles Scott, 25 May 1932, Mines Department, MD 1, 23/1/20, Part 1, ANZ-W.

⁵⁵⁰ *Waikato Argus*, 9 February 1899, p. 2.

⁵⁵¹ *Observer*, 29 July 1899, p. 7.

Sydney later that year, the *Observer* described him as a ‘lightning change artist’,⁵⁵² for the boat was late and he had to conduct the evening service:

Did Joseph get excited? or interview the chief engineer? or worry the captain? Not at all. He never even turned a hair, but went right on explaining the beauties of the thermo-hyperphoric process to an eagerly-listening passenger until the Mararoa was alongside the wharf at 7.25. Then, bidding everybody a hearty adieu, he jumped into a cab, gave the cabby orders to drive like Jehu, and whilst on the road changed himself from a mining expert into an Anglican parson, so that at a quarter to eight he appeared on stage - we mean he mounted the pulpit - attired in full canonicals, and without a trace of hurry blandly gave out the text “What hast thou done?,” a most appropriate one, under the circumstances.⁵⁵³

Campbell gave his farewell sermon as acting vicar on New Year’s Eve. Because he had been such a ‘good and faithful friend’, he was farewelled at a *conversazione*.⁵⁵⁴ At this crowded gathering, the archdeacon describing ‘how generously, and entirely unsolicited’, Campbell had offered to be locum tenens when Dudley’s health had broken down. After being praised for his good work, Campbell was given a purse of sovereigns, amongst other presents, and an engrossed address.⁵⁵⁵

His duties completed in Auckland, by January 1900 Campbell was taking services at Te Aroha once more.⁵⁵⁶ Just before he left, a packed ‘grand farewell social’ was held and presentations made.⁵⁵⁷ After he and his wife were thanked for their ‘material assistance to the church’, he ‘expressed the pleasure they had both experienced in working for the church in the district’ and said that he would ‘always have pleasant recollections of his sojourn’. Te Aroha had ‘grand assets in its domain, its baths, and its drinking waters, and he would never cease to spread the fame of these

⁵⁵² *Observer*, 2 September 1899, p. 3.

⁵⁵³ *Observer*, 2 September 1899, p. 7.

⁵⁵⁴ *Church Gazette*, February 1900, p. 26.

⁵⁵⁵ *Church Gazette*, March 1900, pp. 45-46; *Thames Star*, 2 February 1900, p. 2.

⁵⁵⁶ *Te Aroha News*, 6 January 1900, p. 2, 13 March 1900, p. 2.

⁵⁵⁷ *Ohinemuri Gazette*, 25 July 1900, p. 2.

attractions'. They went 'away with pleasant recollections. I can say we are pleased to have known you'.⁵⁵⁸

In 1900 Campbell took some services at St John's, Waihi, where in May he gave an 'entertainment' about church history. 'Many' were sorry that he was 'not always with us. The church was crowded last Sunday for the first time since its enlargement'.⁵⁵⁹ In June, he gave his last sermon there,⁵⁶⁰ and later in the month conducted a Masonic service at which a Communion set, purchased by Campbell from funds raised by his lectures, was used for the first time.⁵⁶¹ Because of his 'great services', he was presented with an illuminated address at a farewell social.⁵⁶²

SOCIAL LIFE

Campbell and his family were prominent members of the Te Aroha community, he being familiarly known as 'the Rev. Joseph'.⁵⁶³ Within four months of settling, he was elected one of the two vice-presidents of the cricket club,⁵⁶⁴ to which he later presented 'a splendid bat' to be awarded to the highest scorer of the season.⁵⁶⁵ He delivered the inaugural address to the Te Aroha Literary and Recreation Society, a self-improvement society for young men organized by the Protestant clergy, and became one of its two vice-presidents.⁵⁶⁶ His two daughters played in local tennis tournaments.⁵⁶⁷ And when a Te Aroha rugby team played against one from the Thames School of Mines, their war cry was 'hyperphoric'.⁵⁶⁸

On one occasion, Campbell was involved in a controversy over the state of the hot pools and the rules governing them.⁵⁶⁹ A 'casual visitor' was

⁵⁵⁸ Te Aroha Correspondent, *New Zealand Herald*, 31 July 1900, p. 6; *Auckland Star*, 1 August 1900, p. 2.

⁵⁵⁹ Waihi Correspondent, *Thames Star*, 11 May 1900, p. 4.

⁵⁶⁰ *Thames Star*, 13 June 1900, p. 4.

⁵⁶¹ *Thames Star*, 27 June 1900, p. 2; *New Zealand Herald*, 27 June 1900, p. 6.

⁵⁶² *New Zealand Herald*, 27 June 1900, p. 6; *Thames Star*, 19 July 1900, p. 4.

⁵⁶³ Letter from 'A Casual Visitor', *Te Aroha News*, 26 April 1898, p. 2.

⁵⁶⁴ *Te Aroha Times and Waiorongomai Advocate*, 3 November 1897, p. 2.

⁵⁶⁵ *Te Aroha News*, 8 March 1900, p. 2.

⁵⁶⁶ *Te Aroha News*, 3 February 1898, p. 2, 17 March 1898, p. 2, 18 June 1898, p. 2.

⁵⁶⁷ *Te Aroha News*, 27 January 1900, p. 2, 3 February 1900, p. 2.

⁵⁶⁸ *Thames Star*, 5 September 1898, p. 4.

⁵⁶⁹ See editorial, *Te Aroha News*, 16 April 1898, p. 2.

appalled that ‘a professed disciple of the Prince of Peace should himself take the bellows and blow the smouldering coals into a more lurid flame’, and wondered whether Campbell had ‘been egged on to rush into print’ (his published views have not survived). He accused this ‘meddling parson’ for stirring up strife.⁵⁷⁰

Campbell mingled in high society in 1899, for when the Governor, Lord Ranfurly visited Te Aroha he mentioned his interest in the treatment of the district’s ores. ‘Scientists were engaged in endeavouring to solve the problem whereby the golden dust that these refractory ore contained would be extracted, and from what he had heard and read of the district, in the event of these scientific experiments being successful, there was a good future before Te Aroha’.⁵⁷¹ Clearly excited by Ranfurly’s expressed interest, Campbell gave him what the *Observer* described as an ‘exciting adventure’:

During the evening the Rev. Campbell, of hyperphoric fame, gave His Excellency a look-in, and asked him “up to the house to spend an hour or two”.... The invitation was accepted on the spot, and the two set out for the scene of festivities. The night was pitch dark, and, as hyperphorics hadn’t been booming, the minister wasn’t running a carriage. But he knew of a good track. It was a bit zigzaggy, but he had been up and down it scores of times, and could recommend it as a short cut. All that His Excellency had to do was to keep clear of the stumps and mind the holes, and they would be “there” in a few minutes.

Ranfurly agreed to the track route, and it was taken; and, as the journey proceeded, the parson struck up a conversation on gold, or something else, and had His Excellency interested in no time. They had traversed about half the distance, when the minister missed the responsive “Ah’s” and “Yes’s” of his companion, and looked around to inquire the cause. Lo, and behold, Ranfurly had vanished! The rev. pilot was at once seized with sore misgivings. “Where *are* you, my Lord?” he cried aloud. “I’m in a hole,” gurgled a voice from the wilderness.

The parson hastily retraced his steps in the direction of the gurgle, and, after a lot of hard shouting and much battling, he dropped across the lost one. “My Lord” had taken a header into a not too deep shaft, and was extricating himself with energy and as much agility as he could muster. Campbell lent a willing hand, and hauled the Governor out. But poor Ranfurly didn’t look a bit like a Governor. He was more like a terra-cotta statue, and

⁵⁷⁰ Letter from ‘A Casual Visitor’, *Te Aroha News*, 26 April 1898, p. 2.

⁵⁷¹ *New Zealand Herald*, 10 May 1899, p. 6.

second-hand at that. He had the clay on thick, and his nearest friend wouldn't have known him.
But His Excellency wasn't going to lose his night out through a little mishap of that kind.

They continued on to Campbell's house, where 'an impromptu change of clothing was effected' while the Governor's clothes were washed and hung out to dry. Wearing his own clothes, before dawn Ranfurly returned to his railway carriage to sleep,⁵⁷² as illustrated by a full-page cartoon.⁵⁷³ A reference to the same event one year later suggests Ranfurly was less amused than the *Observer* claimed and had not availed himself of Campbell's hospitality for long. 'His Excellency kept clear of the Rev. J. Campbell on his recent Te Aroha trip: the abandoned shaft, the clerical rig, and the hasty flight are recollections still of that awful night'.⁵⁷⁴

POLITICAL VIEWS

Indications of Campbell's political views can be found in his disapproval of trades unions demanding high wages from their members, as he complained to the Webbs, his cryptic reference to state corruption,⁵⁷⁵ and by his patriotic fervour during the Boer War. Although he declined to be a member of the local Transvaal War Fund Committee, he declared 'that the movement had his cordial sympathy'.⁵⁷⁶ He preached to a Church Parade on a Sunday set aside as a day of intercession for the war.⁵⁷⁷ At a patriotic concert in the domain, he made a speech about 'the noble efforts of the colonies on behalf of the Motherland', declaring 'that in the present context, as in many another, the British Empire stood for the principles of justice and righteousness. The ardent spirit of loyalty that breathed in his words communicated itself to the vast audience, which he succeeded in rousing to a high pitch of enthusiasm'. He then 'repeated the first verse of that well-known hymn, "O God our help in ages past," all present joining in the

⁵⁷² *Observer*, 3 June 1899, p. 6.

⁵⁷³ Cartoon by 'Blo' [William Blomfield], *Observer*, 3 June 1899, p. 12.

⁵⁷⁴ *Observer*, 14 April 1900, p. 3.

⁵⁷⁵ *Webbs in New Zealand*, p. 27; Branagan, p. 30.

⁵⁷⁶ *Te Aroha News*, 18 January 1900, p. 2.

⁵⁷⁷ *Te Aroha News*, 10 February 1900, p. 2.

singing'.⁵⁷⁸ He gave the opening address to a social held a few days later to raise money for the Patriotic Fund.⁵⁷⁹ Although born in New South Wales, to him England was 'Home'.⁵⁸⁰

WORKING FOR THE CHURCH AFTER LEAVING TE AROHA

When farewelled at the St Sepulchre's conversazione, Campbell stated that,

while he was a passionate lover of nature, and an enthusiastic devotee of science, and took the deepest interest in the development of the mineral resources which this country possessed, the work of the sacred ministry to which he had been ordained possessed always the first place in his heart and the first claims upon his life; and he hoped, when his present responsibilities were fulfilled in connection with his mining undertakings, to confine himself more entirely to the ministerial work.⁵⁸¹

After these 'responsibilities' ended, at first he had not decided whether to 'take his family to Tasmania or home to England, but they will ... spend a few months in the South Island, where, at the invitation of the Bishop of Christchurch, he will take a temporary charge and study the geological features of the country'.⁵⁸² He wanted to live in a district with 'geological or metallurgical problems to occupy his spare time'.⁵⁸³ He was placed 'in temporary charge of the parish of Tinwald for three months, and for a similar period at St Paul's, Papanui', Christchurch, from late September 1900 to March 1901, when he was appointed vicar.⁵⁸⁴

In late 1903, he was invited to become archdeacon and rector of Cairns in Queensland, prompting the *Observer* to suggest, presumably sarcastically, 'the possibility that there must be refractory ores to be treated in that neighbourhood. After the Rev. Joseph's experience at Te Aroha, it

⁵⁷⁸ *Te Aroha News*, 13 February 1900, p. 2.

⁵⁷⁹ *Te Aroha News*, 17 February 1900, p. 2.

⁵⁸⁰ For example, *Auckland Weekly News*, 29 June 1900, p. 42.

⁵⁸¹ *Church Gazette*, March 1900, p. 46.

⁵⁸² *Auckland Weekly News*, 29 June 1900, p. 42.

⁵⁸³ *New Zealand Herald*, 3 July 1900, p. 6.

⁵⁸⁴ *Cyclopedia of New Zealand*, vol. 3, p. 195; *Crockford's Clerical Directory*, p. 224; Branagan, p. 20.

would be a strong inducement'.⁵⁸⁵ Campbell took up this post in February 1904, and remained there until resigning in September 1909, just before going overseas to further his research on cotton.⁵⁸⁶ In March the following year, the Bishop of North Queensland privately warned other bishops not to employ Campbell before consulting him. Although he 'remained friendly' and urged Campbell to reconsider his resignation, he did not approve him 'relinquishing his spiritual duties for material interests'.⁵⁸⁷ According to his *Autobiographical Sketch* of 1922, 'the majority of Church Dignitaries' in North Queensland did 'not approve of my broad teaching'; he did not mention that he had resigned to make money from secular activities.⁵⁸⁸ Not until 1924 would Campbell have another parish, in New South Wales.⁵⁸⁹

NORTH QUEENSLAND

Having moved to North Queensland in November 1903, 'Campbell retained his interests in mining and geology, holding a weekly class in practical mineralogy for St John's Men's Club'.⁵⁹⁰ He later described the 'first few years' of his life in Cairns as 'rather trying, after the arduous scientific work in which I had been engaged. I did not rest till I again had my laboratory at Kamma'.⁵⁹¹ In 1905 he toured giving lectures on mining and produced his last geological booklet, *The Key of Knowledge for Miners, or, What's the Value of this Ore?*, along with 'The Miner's Assaying Cabinet' containing 'everything required for applying the methods described'. His interest in geology continued until at least 1909.⁵⁹²

According to Campbell, all his 'spare time was devoted to the study of tropical industries. I had a small laboratory, and used to analyse soils and minerals for all comers, besides giving weekly instruction in Mineralogy and Geology'.⁵⁹³ He became increasingly involved in agriculture, particularly growing cotton. In his words, he experimented with several

⁵⁸⁵ *Observer*, 14 November 1903, p. 7.

⁵⁸⁶ Branagan, p. 20.

⁵⁸⁷ Kenneth Cable to Philip Hart, 8 April 1988; Branagan, p. 20.

⁵⁸⁸ Campbell, *Autobiographical Sketch*, [p. 6].

⁵⁸⁹ Kenneth Cable to Philip Hart, 8 April 1988.

⁵⁹⁰ Branagan, p. 30.

⁵⁹¹ Campbell, *Autobiographical Sketch*, [p. 14].

⁵⁹² Branagan, pp. 30-31.

⁵⁹³ Campbell, *Autobiographical Sketch*, [p. 8].

varieties, concentrating on the *Caravonica* one already growing in North Queensland, achieving 'such encouraging results' that his bale in the Franco-British Exhibition of 1908 'was awarded the Diploma of Honor and was classed as one of the world's best long-stapled cottons'.⁵⁹⁴ In 1909 he gave his occupation as 'Cotton Planter'.⁵⁹⁵ In the following year he visited England 'to bring the results of my tropical work before the public, and I had the honour of being admitted to the Freedom of the City of London. I was also appointed Director of Cotton Culture to the Gosypium Park Estates Ltd, in North Queensland'. To grow cotton on a large scale, he formed a company in London with a capital of £10,000,⁵⁹⁶ It obtained contracts to supply the German market, and before the war sold all he could produce there.

But I had no Government support beyond a 10 per cent bounty and cheap aboriginal labour; and when the bounty ceased in 1915 and the cost of aboriginal labour was increased threefold, and the war nullified my contracts, I was compelled to turn my cotton fields into cane fields and give easy terms to settlers, most of whom are now prosperous cane farmers. Two are now driving their motor cars, and I tell the others that I see their cars just below the surface of the ground, and that soon they too will be driving them.⁵⁹⁷

He blamed the removal of the bounty 'and bad State Government' for his company abandoning cotton 'and appointed me attorney to subdivide the Estates for cane'.⁵⁹⁸ His cotton venture had other handicaps, notably the destruction of his ginnery by fire in 1912.⁵⁹⁹

Upon returning from England he settled at Kamma, just south of Cairns.⁶⁰⁰ From 1910 to 1922 he devoted all his time, 'for the most part without salary', to studying 'tropical resources', specializing in cotton and sugar.⁶⁰¹ In November 1916, a New Zealand newspaper reported that his

⁵⁹⁴ Campbell, *Campbell's Key*, p. 13.

⁵⁹⁵ Marriage Certificate of Joseph Campbell, 9 October 1909, 9954/1909, New South Wales BDM.

⁵⁹⁶ Campbell, *Autobiographical Sketch*, [p. 9].

⁵⁹⁷ Campbell, *Campbell's Key*, p. 13.

⁵⁹⁸ Campbell, *Autobiographical Sketch*, [p. 9].

⁵⁹⁹ Branagan, p. 32.

⁶⁰⁰ Branagan, p. 20.

⁶⁰¹ Campbell, *Autobiographical Sketch*, [p. 9].

‘experiments in the production of paper pulp from noxious weeds and vegetable dues from scrub and native plants have met with pronounced success. The paper mills and woollen manufacturers have thoroughly tested the products’, and ‘pending the formation of a powerful syndicate’ a plant would be erected ‘to execute trial orders, valued at £15,000’.⁶⁰² In 1921 and 1922 he lectured and demonstrated at Cooktown and Babinda, and his ‘special work’ was treating ‘grasses, megass and plants for making paper pulp’ and extracting dyes from plants and minerals, as well as ‘the analysis of juice’ produced from sugar cane ‘and clarification of same’.⁶⁰³ For financial reasons, the paper pulp mill was later forced to close down, ‘and to protect myself from serious financial loss I was obliged to purchase the greater part of it, which I dismantled’. In 1922, some of the machinery was used for making bone meal and grinding coral, thereby being ‘of great value to farmers’. Given access to a good laboratory, he was confident he could ‘work out many improvements in sugar manufacture’ and do ‘a lot of valuable work in connection with analysis of soils, manures and the diseases of cane, besides perfecting my method of grub-destruction’.⁶⁰⁴ He was ‘in close touch’ with the State Entomologist on ‘plant sanitation’.⁶⁰⁵ In 1922 he described his scientific work:

I am well known throughout the district as an enthusiastic investigator, sometimes laughed at, in a good humoured way, by those who do not understand the symptoms and peculiarities of “The Scientific Disease.” Commercial men look for golden results; but it is to be remembered that a lot of dead, and often expensive work, has to be done before the gold is won. Much of that dead work I have done during the 18 years I have laboured in the North, largely at my own expense, as, in addition to the Company money I brought to the district, I have expended £3000 of my own private money in analysing and demonstrating the value of every natural product either discovered by myself or brought under my notice. My work is known in England, and the results of my investigations re ten valuable commodities, among which are fibres, gums, grasses, rare timbers, minerals, pigments, oils and marine products, are at the present time being tested in the

⁶⁰² *Northern Advocate*, 9 November 1916, p. 2.

⁶⁰³ Campbell, *Autobiographical Sketch*, [p. 9].

⁶⁰⁴ Campbell, *Autobiographical Sketch*, [p. 10].

⁶⁰⁵ Campbell, *Autobiographical Sketch*, [pp. 10-11].

laboratory of the Imperial Institute, London, and cannot fail to yield some beneficial results for North Queensland.⁶⁰⁶

Also in 1922 he announced that, given ‘sufficient interest’, he would publish ‘a practical treatise on cotton-growing in Australia’, to be entitled *King Cotton, The Cloth of the World*. ‘Demonstrator Joseph Campbell M.A., M.I.M.E., The Cotton Expert and Advocate of the far North’, described this industry as one that would ‘help to ensure the future and progress of the Empire’. This work did not appear.⁶⁰⁷

Between 1912 and 1922, according to Campbell’s account, his time was ‘largely devoted to the technique and original investigation of the sugar industry’ on lines laid down by overseas experts, ‘besides following up the work of world-renowned experts recorded in the journals of the Society of Chemical Industry’, of which he was ‘an active member’ for years. Although he had ‘not actually worked as a paid officer in any sugar mill’, he did laboratory work in one mill for part of the 1920 season and was in touch with chemists working in the industry and studied three mills’ ‘routine as opportunity offered’.⁶⁰⁸ In May 1922, the Mulgave Central Mill required a chief analytical chemist, and, ‘yielding to the solicitations of certain people interested in the development of the sugar industry, he decided, after much consideration’, to apply. Shortly afterwards he withdrew his application, ‘for reasons which need not be specified, excepting that he learned that the Directors only required a mill chemist, and not a highly qualified scientific chemist’. With typical immodesty he considered that, if the directors had ‘been fortunate enough to find a man with qualifications in his particular department of the same high order as those of the Demonstrator’, they were ‘to be heartily congratulated’.⁶⁰⁹ North Queensland required ‘the assistance of the highly-trained, practical scientist’.⁶¹⁰ In his application he had admitted not being ‘familiar with the minute details’ of the mill ‘from start to finish’, but considered that ‘after a fortnight’s run’ he would ‘have strengthened the few weak points’.⁶¹¹ ‘Hard work and I are in perfect accord, and I will work in the laboratory and mill night and day, if

⁶⁰⁶ Campbell, *Autobiographical Sketch*, [p. 12].

⁶⁰⁷ Branagan, p. 32.

⁶⁰⁸ Campbell, *Autobiographical Sketch*, [p. 4].

⁶⁰⁹ Campbell, *Autobiographical Sketch*, [p. 3].

⁶¹⁰ Campbell, *Autobiographical Sketch*, [p. 4].

⁶¹¹ Campbell, *Autobiographical Sketch*, [p. 5].

necessary, without a murmur; in fact, this sort of work is not work to me, it is a pleasure'.⁶¹²

In August that year, when he was living in South Cairns in a house named 'Arcadia', he published at his own expense his *Autobiographical Sketch*. It was written for those who might use his services as director of the 'North Queensland Intelligence Bureau' to 'examine and report on any tropical produce'.⁶¹³ The cover listed his academic qualifications and the organizations he had been a Fellow of, and described him as 'Demonstrator of all Tropical Industries' and a 'Certified Assayer and Technological Chemist' with '18 years intimate knowledge of the Life, Industries and Scientific development of North Queensland'.

THE INTELLIGENCE BUREAU is established for the purpose of giving reliable, and if necessary, confidential, information respecting the Lands, Agricultural Industries, especially Sugar, and other Industries which are or ought to be engaged in; Minerals, Mining Propositions including Treatment of Ores; Forest Scrub and Marine Resources.

A feature of the Establishment will be the cultivation of a small plot of Land on which tests will be made with varieties of Cane, Cotton, Peanuts, Cassava, special attention being given to Plant Sanitation.

Assays of Minerals, Analyses of Soils and Manures and determination of the C.C.S. contents of Sugar Cane will be undertaken.

He listed the hours of consultation, and advertised that every Sunday afternoon he provided 'Pleasant Chats in the Museum of Tropical Resources 3.30 to 5'.⁶¹⁴

The *Autobiographical Sketch* stressed that 'the success of the Bureau will largely depend on the measure of Public Support accorded'.⁶¹⁵ Clearly he did not receive much support, for the following year he was living in Sydney, where he published another pamphlet, *Campbell's Key of Knowledge of Science and Industry*. It was subtitled '*The Opportune Moment*' for the Man on the Land, for *Exterminating the Fruit-Fly Pest[,] the Sugar-Cane Pest[,] Bunchy Top in Banana[,] Timber Borers and for getting*

⁶¹² Campbell, *Autobiographical Sketch*, [p. 11].

⁶¹³ Campbell, *Autobiographical Sketch*, [p. 1].

⁶¹⁴ Campbell, *Autobiographical Sketch*, cover.

⁶¹⁵ Campbell, *Autobiographical Sketch*, cover.

Expert Advice in Cotton-Planting[,] Peanut-Growing &c. &c. Being, like his *Gold, and How to Get It* of 1895, very revealing about his pretensions and very similar to his claims of expertise in treating ore, it is quoted at length.

A stanza from Alexander Pope was cited on the title page:

HAPPY THE MAN, whose wish and care
A few paternal acres bound,
Content to breathe his native air
IN HIS OWN GROUND.

At the foot of the page readers were told they might ‘interview Demonstrator CAMPBELL at the Science and Industry Intelligence Bureau, 155 PHILLIP STREET, SYDNEY, generally between 10 and 1 daily, but preferably, by appointment, as he is a busy man’.⁶¹⁶ It was emphasized that he was a member of the Institute of Mining Engineers of England, the Royal Agricultural Society of England, and the Society of Chemical Industry, and a Fellow of the Geological Society and Chemical Society of London.⁶¹⁷ The Foreword stated that since 1904 he had been ‘Hon. Demonstrator of North Queensland Tropical Resources’ and that his lectures on agriculture had entertainment value in addition to providing information, being ‘largely attended by people eager to be instructed. Even in a small town like Cooktown, as many as 150 will assemble to hear a popular science lecture enlivened by musical selections and a song or two, such as “How are you gonna keep ’em down on the farm after they’ve seen Paree?” ’ This was indeed his concern, because of ‘pest difficulties’ rather than the allure of big cities:

The present offer is made for the purpose of bringing within reach of the orchardist available means of exterminating the fruit pests and thus enabling him to earn a good living on his little plot; also of stimulating interest in land settlement by means of appropriate lectures which demonstrate clearly the lines on which the settler should work, in a more popular way than that usually adopted, viz, by showing limelight views at picture shows and in public halls of what can actually be accomplished, and by chemical experiments. This is Demonstrator Campbell’s method. He illustrates his remarks on soils and manures by simple tests actually performed on the platform in full view of his hearers; and if sufficient inducement offers in N.S.W., he will publish a small

⁶¹⁶ Campbell, *Campbell’s Key*, title page.

⁶¹⁷ Campbell, *Campbell’s Key*, pp. 3, 7-8.

work on the lines of “Simple Tests for Minerals,” entitled “Simple Tests for Soils and Manures” – tests that the Man on the Land or his son or daughter, still attending the public school, can easily carry out after supper and provide a pleasant and profitable evening’s amusement.

It has also been suggested that he should publish a cheap practical book for the **Cotton Planter** for whose benefit some interesting information is given in the following pages. He is willing to do this “for the man on the land” – “for the cause that lacks assistance.”

“Let us, then, be up and doing,
 With a heart for any fate:
 Still achieving, still pursuing,
 Learn to labor and to wait.”⁶¹⁸

Next was a photograph of ‘Demonstrator Campbell at work in his humble laboratory in far North Queensland, wrestling with the secrets of Nature, the practical results of which are now freely offered to the Man on the Land’. It showed very little equipment, reinforcing his view that ‘a vast amount of useful work can be accomplished by means of the simplest apparatus’. For 30 years (which dated its creation to before his departure for New Zealand) this ‘simple laboratory’ had been maintained ‘at an average cost of £100 per annum. He recommended the Department of Agriculture should provide one for every community and employ ‘a few itinerant trained practical scientists to give systematic instruction’, for the man on the land ‘urgently needed’ the assistance of science.

The main text was headed: ‘Comments and a Plain Statement of Facts leading up to a Definite Offer of Help’. Before providing the practical advice promised, he gave details of his life and views about the scientific community. Having attended the opening of the Pan-Pacific Science Congress in August, he complained that

though one of Australia’s oldest workers in Science and Industry, spending and being spent in the noble cause for over 25 years, I was not invited to be a member of the Congress, and was thus denied the privilege of giving to the world an outline of the results of my investigations per the medium of the published transactions of the Pan-Pacific Science Congress. We cannot all be leaders – some must be content to be non-coms.

⁶¹⁸ Campbell, *Campbell’s Key*, pp. 3-4.

He explained his discontent at length. ‘Those of us who are best qualified by education and field work claim to be regarded as fellow-students and fellow workers’ with specialist researchers.⁶¹⁹ Possibly his recommendation that readers should obtain a copy of the panoramic group photo of delegates was an implied slur on the delegates: ‘For many reasons – including phrenologic – you should secure a copy. It certainly furnishes material for the study of comparative psychology’.⁶²⁰ After citing lack of funds as the reason why ‘ardent workers in the cause of Science and Industry’ such as himself were prevented ‘from carrying out our plans and testing our theories on an elaborate scale’, he criticised the congress:

Perhaps having graduated in pure science and then having gone into comparative isolation, first in New Zealand and afterwards in North Queensland, to apply my scientific knowledge to the solution of great economic problems with but limited capital at my disposal, only visiting Europe on three occasions during 40 years to get first-hand information as to the achievements of modern science and make known the results of my own humble investigations into the problems and applications of science, I am a little disappointed that some phases of pure science were not more adequately dealt with.

Theories ‘which some of us enunciated over a quarter of a century ago’ were ‘somewhat elaborated’, but no new knowledge was provided.⁶²¹

I admit that I am but a child in scientific knowledge, yet I have during my 43 years of practical application of the pure science I learned in my alma mater, carefully followed the deductions of those highly favoured students of pure science who have command of the greatest facilities for prosecuting their researches that the world has ever known.⁶²²

He supported the recent belief of unnamed scientists that the planet was ‘enveloped in an electrical ring, and that its gradual descent upon the earth, now in course of progress’, would destroy insect pests and parasites. In his ‘humble way’, having ‘worked out electro-chemical and electro-physiological methods of dealing with some matters of vital importance to

⁶¹⁹ Campbell, *Campbell's Key*, p. 6.

⁶²⁰ Campbell, *Campbell's Key*, p. 4.

⁶²¹ Campbell, *Campbell's Key*, p. 7.

⁶²² Campbell, *Campbell's Key*, p. 8.

Commonwealth development', he was 'convinced that further knowledge in this direction will lead to marvellous results. We are on the very threshold of great discoveries', and he was disappointed that visiting scientists had not 'elaborated these matters'.⁶²³

Campbell then gave two examples of 'great works' he had inaugurated. From 1908 to 1915 he had demonstrated how cotton could be grown in North Queensland, which had been taken up by the Queensland and New South Wales governments. From 1916 to 1918 he had shown how paper pulp could be manufactured from grasses, shrubs, and soft timber trees, a discovery being 'more fully exploited by the Federal Institute of Science and Industry'. He predicted that both industries would become 'important factors in the development of the Commonwealth'.⁶²⁴

He illustrated the pamphlet with photographs, many of which were projected during his lectures, enabling him 'to bring facts before my audience in an attractive and convincing manner'.⁶²⁵ He discussed the best types of cotton and his involvement in developing this industry, and offered his services to cotton companies seeking reliable information about 'land acquisition and labour'.⁶²⁶ He mentioned the possibility of growing peanuts, another crop he had investigated during '19 years' toil in the far north in the interests of Science and Industry'.⁶²⁷ Then followed another lament about his self-sacrificial and ignored devotion to the cause of science and the nation:

I have had a few generous friends who helped me in my research work prior to and during the war to the extent of a few hundred pounds; but I never received any Government help; nor, though one of the foremost workers in the cause in North Queensland, was I even asked to help the Institute of Science and Industry which I might have done with great advantage to the furtherance of the investigations being carried on. But I happened to live away up in the far north, and, as is generally the case – "out of sight, out of mind." However, I pursued the even tenor of my way demonstrating the value of every tropical resource that was brought under my notice, and to-day I probably know more about

⁶²³ Campbell, *Campbell's Key*, pp. 8-9.

⁶²⁴ Campbell, *Campbell's Key*, p. 9.

⁶²⁵ Campbell, *Campbell's Key*, p. 9.

⁶²⁶ Campbell, *Campbell's Key*, pp. 10-15.

⁶²⁷ Campbell, *Campbell's Key*, p. 15.

the potential wealth of tropical Australia than any one else, and I know too how the various industries can be promoted.⁶²⁸

Because of the great need for ‘fully qualified practical scientific men to work’ in conjunction with government scientists to ‘help release the red tape fetters which render ineffectual so many sections of departmental work’, he had offered his services to the Queensland and New South Wales governments. He had asked only for ‘out-of-pocket expenses’ and stipulated that he be ‘remunerated according to results’, but ‘professional jealousy and foolish ideas of professional etiquette’ meant his offers were declined, ‘and the people suffer in consequence to the extent of hundreds of thousands of pounds annually’. He ‘never had time to devote to politics’ and belonged ‘to no recognised party’: ‘The service of man is the simple rule of my life, and always has been’. As his offers were declined, he had returned to New South Wales after 26 years’ absence to help farmers there. ‘If I were to give up my work in Science and Industry and go into politics, and take a portfolio, I might be able to help the man on the land to some extent: but not so much as by doing what I am doing at present’. And not only helping the man on the land but also ‘the man who works UNDER the land, viz, the miner, whom I have striven to help, by the union of Science and Industry, for well nigh 40 years’.⁶²⁹ Finally, he came to his offer:

I wish to come among you and work with my hands as well as with my head, as I have always done. I am not an 8-hour man. Most of my life I have worked 16 hours a day; and though advancing in years am still in the prime of life.

I am not seeking for a highly-paid billet. All I ask is that my out-of-pocket costs be defrayed, and these will be less than the average working man’s wage, as I fortunately have a small private income which for 30 years has been at the disposal of the State of New South Wales and Queensland and the Dominion of New Zealand.

The orchardist, banana planter, cotton-grower, cane farmer and timber men should meet his costs, ‘as I have already spent too much of my private means’ providing assistance. He assured orchardists he could rid them of fruit fly by ‘a method of soil treatment which after one or two seasons will

⁶²⁸ Campbell, *Campbell’s Key*, pp. 15-16.

⁶²⁹ Campbell, *Campbell’s Key*, p. 16.

permanently exterminate' them. Although not a trained entomologist, he had learnt from them and could apply their research:

In very few cases are they really practical men and they often waste a lot of time and money in trying to do things which they [should] better leave to us. They are the students of pure science: we are the students of applied science. They are, however, indispensable in their own domain, and we hold an intermediate position – a balance adjuster as it were – between them and the man on the land. I have long been anxious to make this clear, and hope I have done so.⁶³⁰

In 1907 he had reviewed for the *Cairns Morning Post* an American book, *The New Earth*, which he recommended because it confirmed his belief that chemical sprays alleviated but did not prevent pests. What was required was 'Nature's method; that is the application of the other insects, enemies of the pests, to effect their destruction', giving a Californian example.⁶³¹ Although unable to provide 'the insect necessary to control or exterminate your fruit pest', he could 'demonstrate practical methods' to destroy them. For the cane grub, he had 'discovered an effective chemical solution years ago, but it cost at least £3 per acre to apply it effectively' and was only 'a temporary expedient'; he found that sawdust 'saturated with my solution and applied as manure at the time of planting, proved effective as a grub deterrent'.⁶³² The real remedy was 'cane plant selection and intensive cultivation', and he asked 'practical farmers and orchardists' to send him details of their methods,

for many of them have their own ideas, and good ones too; and I shall be glad to supply enquirers with information of my own methods, and moreover we must **jointly** make more use of our State experts. It is only in this way that we can justify the vast expenditure of public money that their employment entails.

He had 'a simple and inexpensive method' to prevent bunchy top in bananas, and could prevent borer in timber at a cost of about two shillings per log. Urban dwellers wishing to become cotton and cane farmers were offered his expert advice:

⁶³⁰ Campbell, *Campbell's Key*, p. 17.

⁶³¹ Campbell, *Campbell's Key*, pp. 17-18.

⁶³² Campbell, *Campbell's Key*, p. 19.

I am willing to come and lecture and show views in any centre where it is desirable that I should address the people by way of stimulating activity in this direction.

I now leave my offer of help in your hands. Talk it over and see how you can best use the offer. "Take but this favour yet: be slave no more." Talk it over with the business men of your district.... Perhaps a little "Scientists' Help Fund for the Man on the Land" might be started in the district. The cost to the individual or to the community will be a mere bagatelle in comparison with the benefits that are certain to follow upon my visit.

Prompt action is necessary, as the pest season is at hand, and I shall be pleased to hear from you.⁶³³

There followed a publisher's note that if there was sufficient interest 'a practical treatise on cotton-growing in Australia' by Campbell, 'The Cotton Expert and Advocate of the far North', would be published. Cotton would 'help to ensure the future and progress of the Empire', and he offered 'The Golden Key of Knowledge' to everyone to use 'for their own benefit and for that of the great Australian Commonwealth'. The proposed title page had

a picture parable of the tri-unity (trinity) of the cotton bush -

SCIENCE, INDUSTRY AND PROSPERITY

Firstly: The leaf of the cotton bush, the study of which needs science, producing

Secondly: The ripe boll, the large yield of which is the result of industry, resulting in

Thirdly: Prosperity – Well-appointed homes, with bonnie children.

As an example of this, in the middle of the leaf was the face of his infant son, which testified 'to the healthiness of the climate so often maligned by those who don't know'.⁶³⁴ 'King Cotton' could provide work for 'millions yet unborn' in Australia's waste lands, and cotton mills would make the far north 'the Lancashire of Australia'. Land should be made available for settlers with small means: 'Private enterprise, by means of properly organized companies will accomplish this far more satisfactorily

⁶³³ Campbell, *Campbell's Key*, p. 20.

⁶³⁴ Campbell, *Campbell's Key*, pp. 21-22.

than State enterprise by means of its departments'.⁶³⁵ (This treatise was not published.)

On the last page, there was an illustration of 'The Man on the Land' resting from his labours, followed by a brief quote from Shakspeare's (his spelling) *As You Like It*:

And this our life, exempt from public haunt,
Finds tongues in trees, books in the running brooks,
Sermons in stones, and good in everything.

Followed by an unattributed stanza:

I would not change it. Happy the man
That can translate the stubbornness of fortune
Into so quiet and so sweet a style.

And a final message:

I have left these bright scenes in the far north to come to New South Wales and tell how this can be done. Now is **The Opportune Moment** for the Man on the Land. – J.C.⁶³⁶

After leaving New Zealand, Campbell had conducted a remarkable variety of agricultural experiments:

He made textile fibres from *Sida retusa*, jute, Chinese burr; made a very superior paper from blady grass and a more common commercial paper from pandanus. He produced native dyes ... achieving a true indigo, navy, royal, khaki, gray, brown, pink green and yellow. Other products were dispeptic papain from pawpaw, varnish from native gum, and he extracted candle nut and cotton seed oil.

He also assisted Cairns residents during the influenza epidemic of 1919, and during the shipping strike of that year which prevented flour being imported he 'managed to keep the town going, if on short rations, by

⁶³⁵ Campbell, *Campbell's Key*, p. 22.

⁶³⁶ Campbell, *Campbell's Key*, p. 23.

converting his pulp paper machine to crush a maize flour'.⁶³⁷ Some of his experimental equipment is now in the Queensland Museum.⁶³⁸

As probably Campbell's offers to provide scientific advice were rarely taken up, and his 1923 one clearly was not, he accepted the offer by a former warden of St Paul's College who had become the Bishop of Goulburn of locum tenens positions in rural parishes, the first being at Moruya, on the southern coast of New South Wales.⁶³⁹ In May 1932, when rector of the parish of Barmeduran, New South Wales, he was still interested in mining matters in Te Aroha and New South Wales, being about to have two months away from his home both preaching and advising miners. Although aged 74, he reported himself to be 'hale and hearty, still lecturing and visiting gold fields in connexion with my ministerial duties though I propose retiring shortly to carry out some important experiments and write a book or two before I go West. I have one on hand "Key of Knowledge for prospectors"'.⁶⁴⁰ Whether he did these last experiments is not known, but he never retired, dying in October 1933 of chronic heart disease and senility, aged 76, while still the rector at Barmeduran.⁶⁴¹

PRIVATE LIFE

In 1882 Campbell married Eliza Marion Holt, 'double prizewoman and medallist in French in the junior and senior University examinations' in Sydney.⁶⁴² In 1922 he described her as 'a Sydney lady of University distinction and independent means', the latter assisting him to do 'honorary scientific work'.⁶⁴³ When living at Te Aroha, during 1898 she became secretary of a group of women learning first aid and then of the St John Ambulance Association.⁶⁴⁴ For two years she was the organist at St Mark's

⁶³⁷ Branagan, p. 32.

⁶³⁸ Branagan, p. 34.

⁶³⁹ Branagan, p. 34; Kenneth Cable to Philip Hart, 8 April 1988.

⁶⁴⁰ Joseph Campbell to Charles Scott, 25 May 1932, Mines Department, MD 1, 23/1/20, Part 1, ANZ-W.

⁶⁴¹ Death Certificate of Joseph Campbell, 17 October 1933, 1876/1933, New South Wales BDM.

⁶⁴² Marriage Certificate of Joseph Campbell, 11/1882, New South Wales BDM; *Australian Mining Standard*, 15 July 1897, p. 2031.

⁶⁴³ Campbell, *Autobiographical Sketch*, [p. 6].

⁶⁴⁴ *Te Aroha News*, 3 February 1898, p. 2, 18 June 1898, p. 2.

Church, and also played 'a piano selection' at one of her husband's lectures.⁶⁴⁵ At their farewell by the Anglican parishioners, the vicar 'particularly referred to the valuable services rendered by Mrs Campbell as organist, and the interest she had always taken in the musical portion of the services', and presented her with a 'handsomely-bound' hymn book and prayer book.⁶⁴⁶ She died in London in October 1901, leaving two daughters who were then finishing their education in England and France; a memorial service was held at St Mark's.⁶⁴⁷

In October 1909, when aged 52, he married Ellen Kate Male, aged only 18, in Sydney; a typist, she was the daughter of a Cairns Council Inspector.⁶⁴⁸ He described his second wife as 'one of the noblest and most stately young ladies of North Queensland, of distinguished Scottish descent on her mother's side, and good old English yeoman farmer's descent on her father's side'. His two daughters from this marriage were modestly named Nellie and Ella, but he inflicted their son with the name Cadmus, 'the great Grecian warrior and Prince, who introduced the Greek alphabet into Greece'.⁶⁴⁹

CONCLUSION

Campbell was a compulsive self-publicist, and unable to admit that his ore treatment process had failed even when this was glaringly obvious to everyone else and, presumably, deep down, to himself. Was he a fraud, or merely self-deluded into believing that what he wanted to succeed had in fact done so? David Branagan described him as being,

in his way ... almost a genius, with more than a touch of eccentricity in his later years. His restlessness and his wide interests led him in too many directions, but his agricultural work in North Queensland after he left New Zealand was

⁶⁴⁵ *Auckland Weekly News*, 14 November 1901, p. 30; *Te Aroha News*, 24 March 1898, p. 2.

⁶⁴⁶ *Te Aroha Correspondent*, *New Zealand Herald*, 31 July 1900, p. 6.

⁶⁴⁷ *Auckland Weekly News*, 14 November 1901, p. 30; Campbell, *Autobiographical Sketch*, [p. 6].

⁶⁴⁸ Marriage Certificate of Joseph Campbell, 9 October 1909, 9954/1909, New South Wales BDM.

⁶⁴⁹ Campbell, *Autobiographical Sketch*, [pp. 8-9].

decidedly important. Both his sermons and his written lectures suggest he was also a brilliant teacher.⁶⁵⁰

However, the very multiplicity of his agricultural experiments and the fact that such problems as bunchy top in bananas continued raise questions about his competence in all these areas: the greater the variety of experiments the less likely it was that he was an expert on every issue. The fact that scientists ignored his work just as battery owners ignored his thermo-hyperphoric method of treatment suggests lack of success, and his interest was constantly being diverted, such as when in Te Aroha he experimented with such ideas as producing gas for lighting instead of concentrating on refining his process for treating refractory ore. He seems to have tinkered at many things rather than concentrated on one issue and becoming a true expert, despite all his claims to be an expert at everything. He no doubt expected to succeed, for nobody spends their entire life working on projects they expect to fail. And all his relentless self-promotion suggests that he was not averse to praise and indeed financial benefit.

Although an 'extremely popular' Archdeacon of Cairns, Campbell became aware that many people in Queensland came to regard him as 'a little eccentric'.⁶⁵¹ In 1988 the Bishop of North Queensland recalled him as being 'very well know, widely respected, and highly regarded in North Queensland'.⁶⁵² Kenneth Cable's impression of his career in Australia is that 'he was a gifted eccentric, intellectually restless in a small society and unable to settle down'.⁶⁵³ These assessments are similar to one made in 1899: 'The Reverend Joseph Campbell is a man of many parts, and invariably enters with enthusiasm into anything he undertakes. We may incidentally remark that whenever he starts for a goal he generally gets there'.⁶⁵⁴ The second sentence was not borne out at Te Aroha. A London correspondent correctly noted that he was 'well known as an enthusiast in geology, mineralogy, and mining matters generally',⁶⁵⁵ but enthusiasm does not automatically equate with ability and success, as Campbell, like others

⁶⁵⁰ David Branagan to Philip Hart, 23 September 1996.

⁶⁵¹ Branagan, p. 30.

⁶⁵² John Lewis (Bishop of North Queensland) to Philip Hart, 6 April 1988.

⁶⁵³ Kenneth Cable to Philip Hart, 8 April 1988.

⁶⁵⁴ *Observer*, 2 September 1899, p. 7.

⁶⁵⁵ London Correspondent, *Auckland Weekly News*, 9 January 1897, p. 39.

involved with mining in the Te Aroha district, illustrated. And, like so many others, he was defeated in part by the poverty of the ore.

Appendix

Figure 1: Bo Stent, ‘Tui Creek Mines: Centres of Mining Interest’, in Kevin Wells, *The Noble Aroha: Te Aroha Mountain: Celebrating Te Aroha 125 years (1880-2005)* (Te Aroha, 2005), p. 59; used with permission.

Figure 2: Plan attached to Montezuma Company’s application (granted on 13 May 1898) for two-acre Machine Site at foot of the aerial tramway, showing tramway to Campbell’s Battery Site, Te Aroha Warden’s Court, Mining Applications 1898, BBAV 11289/15a, ANZ-A [Archives New Zealand/Te Rua Mahara o te Kawanatanga, Auckland Regional Office]; used with permission.

Figure 3: ‘Rev J. Campbell’s Reduction Works at Te Aroha’, *Auckland Weekly News*, 4 June 1898, Supplement, p. 4, C16, 705, Auckland War Memorial Museum – Tamaki Paenga Hira; used with permission.

Figure 4: ‘Blo’ [William Blomfield], ‘His Excellency does a little Night-Prospecting at Te Aroha’, *Observer*, 3 June 1899, p. 12.

Figure 5: ‘Blo’, ‘Not in These Clothes, Oh No!’, *Observer*, 10 February 1900, p. 5.

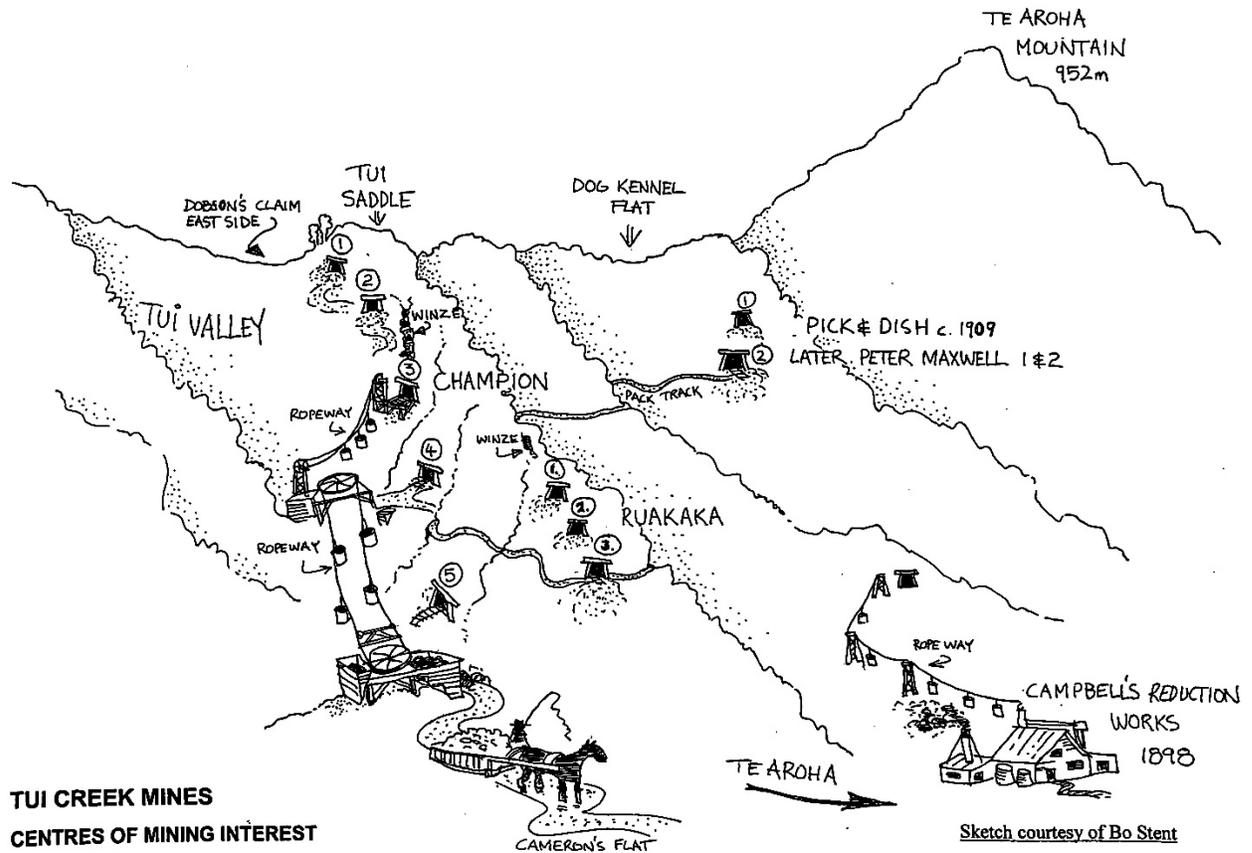


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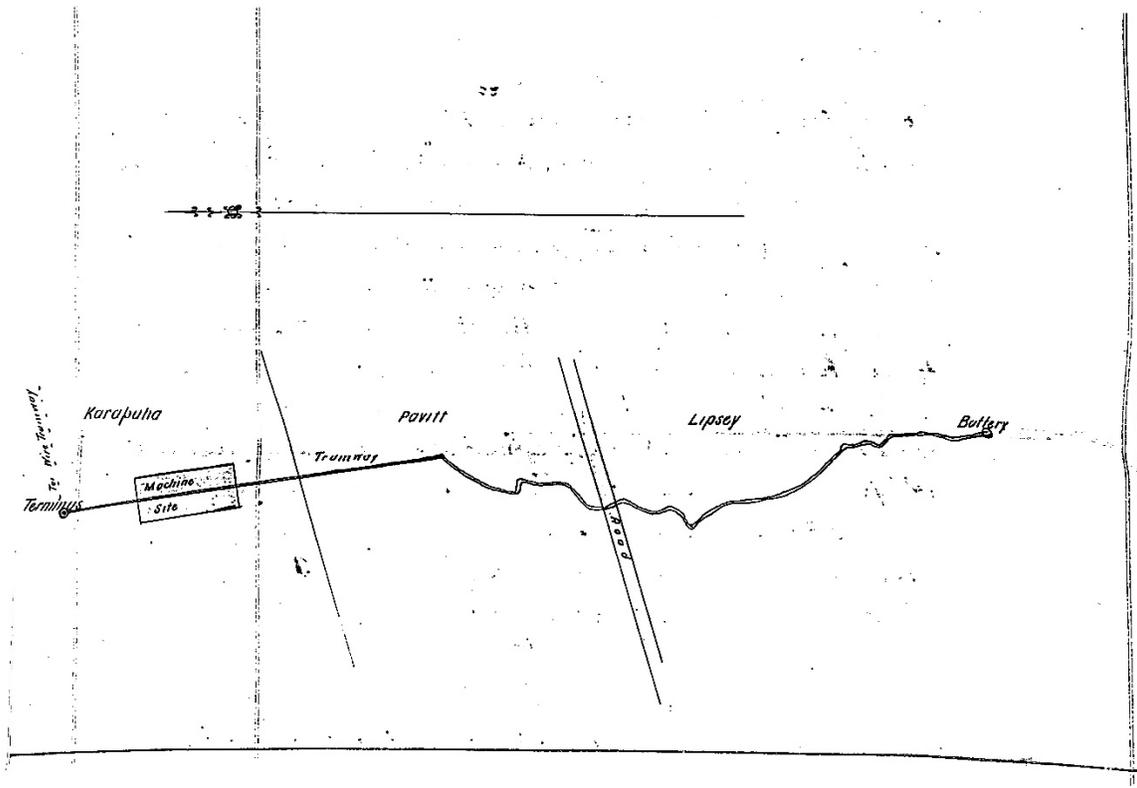
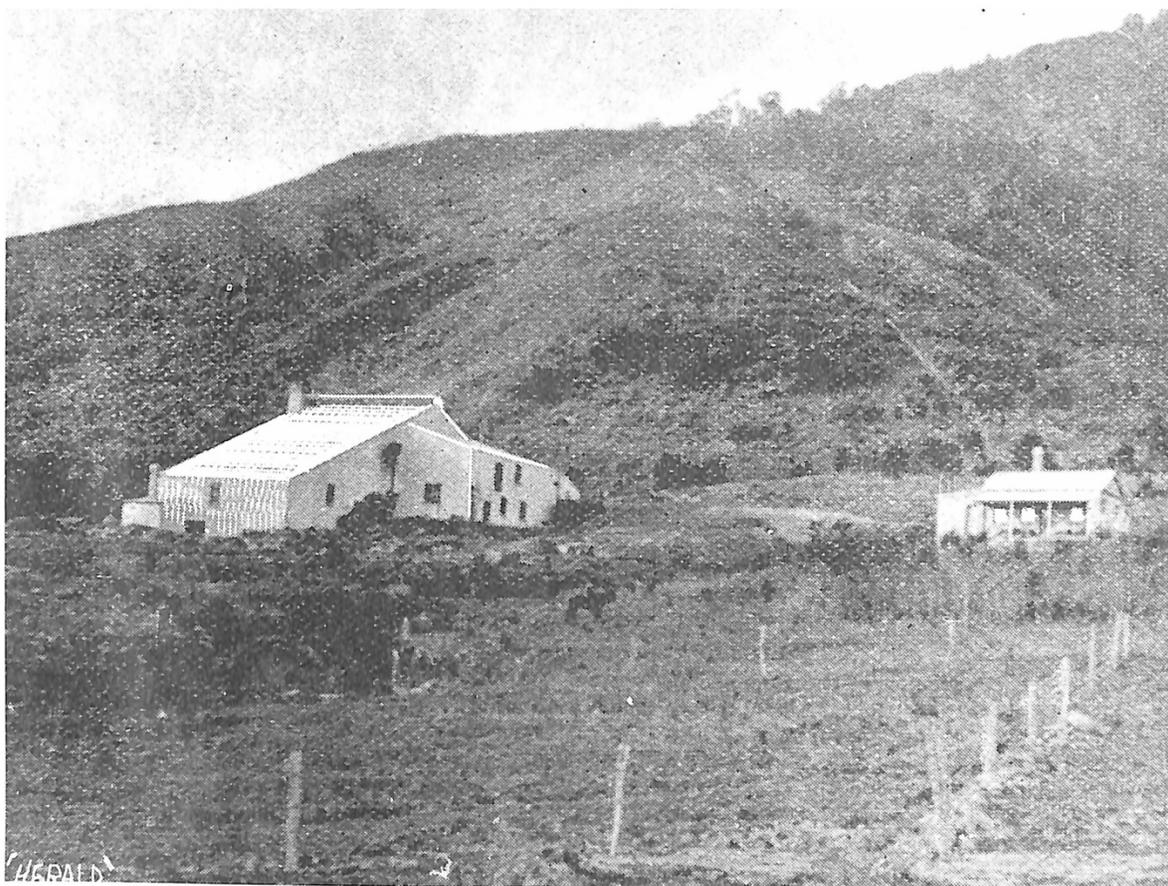


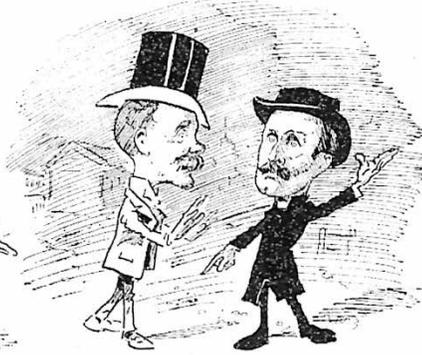
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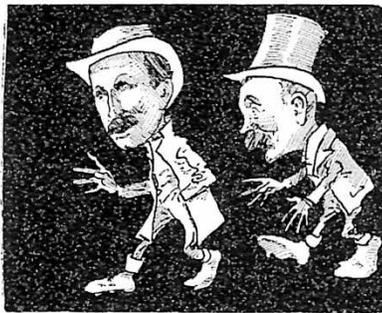
*Figure 3: 'Rev J. Campbell's Reduction Works at Te Aroha', *Auckland Weekly News*, 4 June 1898, Supplement, p. 4, C16, 705, Auckland War Memorial Museum – Tamaki Paenga Hira; used with permission.*



Hyperbolic Parson: 'You promised, dear Governor, that you would come to my house as soon as your day's work was done.
His Excellency: 'Well, this little railway den of mine is really comfortable; but, if I said so, well—done'



'Don't apologise, reverend sir. I'll try the novelty of walking on my feet, if you have no conveyance. I know it's getting dark; but lead on—I'll follow.'



'Your Excellency, this is a short cut to my house. Just follow closely in my footsteps, and I'll explain to you the process.'



'You see, dear Governor, that is the full treatment of— Hullo! Where's His Excellency? Coo-co! Ah! there's his voice. He's surely missed the way.'



'I'm awfully sorry, Your Excellency: it's only an old shaft you've just fallen into, but you should have followed my footsteps.'

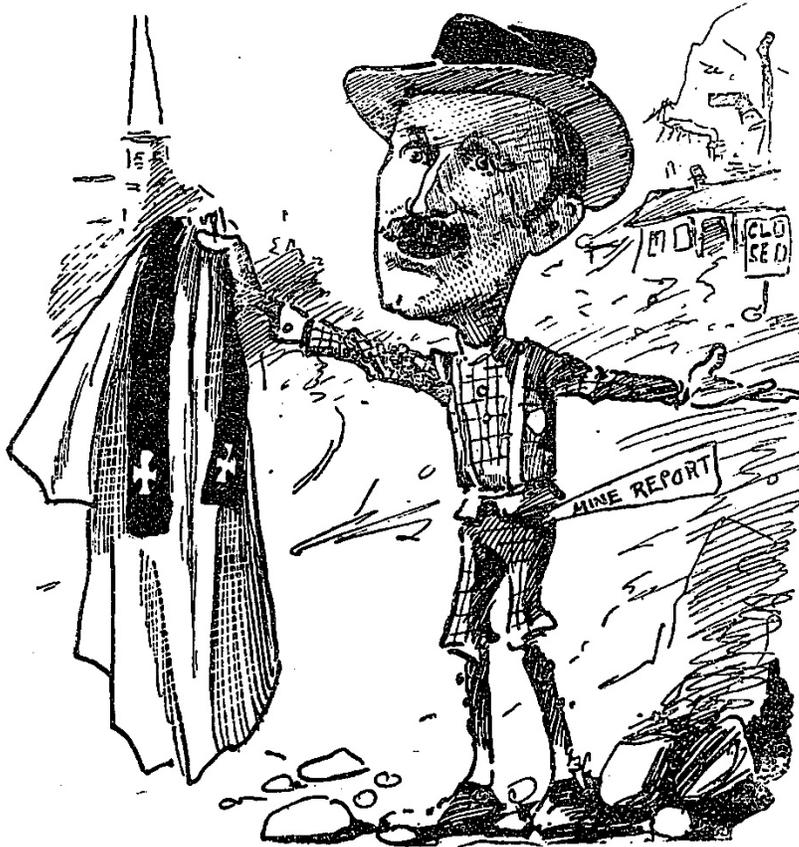


'Your Lordship, we are really happy and comfortable. Your clothes will be dry by the morning. Then we will see the sun rise in all its splendour. Now for the process over again. See, here's the quartz, etc. But His Excellency was missing in the morning when the sun rose. Never again—oh, never again.'

HIS EXCELLENCY DOES A LITTLE NIGHT-PROSPECTING AT TE AROHA.

Figure 4: 'Blo' [William Blomfield], 'His Excellency does a little Night-Prospecting at Te Aroha', *Observer*, 3 June 1899, p. 12.

Not in These Clothes, Oh No!



REV. JOSEPH C——L: Providence tempers [the wind to the shorn lamb. Now that my mining ventures have gone astray, and I have exploited nature—scoffers would say human nature—thoroughly, I have still my surplice to fall back upon. It's a better paying outfit than the mining expert's khaki after all.

Figure 5: 'Blo', 'Not in These Clothes, Oh No!', *Observer*, 10 February 1900, p. 5.