

Herbert Hoover: From Australia to Burma

By DAVID ROGERS

Herbert Hoover was an enigma; ruthless, yet public spirited and sometimes compassionate. He earned people's trust, yet narrowly avoided a serious criminal charge. He set out to make a fortune from mining, yet held from early in his career a desire to enter public life. He succeeded in both ambitions by becoming one of the world's wealthiest men and then winning election to the presidency of the USA. Hoover became renowned for his philanthropy and did not accept any presidential pay for his private use.¹

As a child, he spent Sundays on religious matters, his family being devout Quakers. He was orphaned at nine years of age when his widowed mother died - his father, a blacksmith, having predeceased her by three years.² The extended Hoover family gave Herbert and his siblings new homes but in widely separated towns. Herbert stayed successively with two uncles and their wives during his adolescence and found the last, Dr Minthorn, very strict in requiring Herbert to fulfil responsibilities of work about the home.³ He also took part time jobs when old enough, studied, decided on an engineering career and eventually gained an entry to the newly founded Stanford University. There are indications that he was not very bright at school and that he barely passed the entry-level examination for the University, having failed an earlier test whilst in Oregon. He was part of the initial intake of students at the University's opening on 21st April 1891, graduating in May 1895 - 2 months before his 21st birthday.⁴

During his university years he did extensive geological fieldwork that interested him immensely. He changed his course of study from mechanical engineering to geology and metallurgy then, after graduation, accepted a variety of jobs, including pushing ore trucks, until he was advised to enquire of a top level mining consultant, Louis Janin,⁵ for an opening. Janin had no technical positions available at the time, but Hoover gladly accepted a low paid job as an office rouse-about. It was a foot in the doorway, leading to increasingly responsible assignments, which he performed remarkably well. In fact, he was appointed assistant manager of one mine which was under Janin's control.⁶ Later, on the advice of Janin, Hoover applied for a vacant position with Bewick, Moreing and Co., a London based mine management and finance firm. He was successful, possibly due to good references from Louis Janin. The minimum age of 35 stipulated by Bewick, Moreing did not deter Hoover. Nash, Hoover's biographer for the Presidential Library and Museum⁷, suggested he had raised his age considerably when applying for the position and attempted to disguise his youthful features by growing a moustache and dressing in a style befitting a man some years older. As he was 5ft 11ins⁸, he would have presented an impressive

figure. One of the company executives, on his arrival in London allegedly marvelled at how Americans were able to preserve their youth.⁹

From this point on, Herbert Hoover grew from strength to strength carrying out highly responsible assignments the world over. This essay is confined to mines in Australia, Burma and China with emphasis on Burma, where he won the bulk of his fortune.

His first main job was in Australia centred at Coolgardie, 346 miles east of Perth. At that time dirt tracks sufficed for roads, which, with later motor traffic, became extremely corrugated – as painfully experienced by the author some years later. There was no public water supply, for the pipe from Mundaring Weir (near Perth) was not opened until January 1903.¹⁰ The railway had reached Coolgardie and Kalgoorlie in 1897, just prior to Hoover's arrival. These conditions were a shock to the young educated American who came to be highly critical of the goldfields country and its people.

Gold was discovered in Western Australia on the Kimberly in 1885 then at Southern Cross in 1888 but both these sites were short lived.¹¹ The find at Coolgardie in 1892 proved exciting and this was capped in June 1893 with Paddy Hannan's and Tom Flanagan's find at Kalgoorlie.¹² Then the gold rush started in earnest.

Hoover was classified as an expert inspecting engineer,¹³ his duties being to carry out periodic inspections of various mines, check their prospects, and assess possible mine purchases for Bewick, Moreing and their connections.¹⁴ Hoover provided elaborate reports, including suggestions to abandon some mines and he was always concerned with costs.

In the second quarter alone in 1895 the Perth *Western Mail* reported the registration of 55 new mining companies with an aggregate capital of £4,543,427, which followed £5,031,700 for the first quarter. The item included a warning which is worth quoting:

We summarise the fact that the issues since 1 January have been over 12 million in Sterling, of which nine and a half million has gone into West Australian mining and cognate companies. We hope it will be found that this money has been for the most part well invested, but we cannot help calling attention to the fact that up till now, no single mining company registered in London has paid a dividend. Several of the issuing companies have given handsome returns to their shareholders, but this has been earned by the sale of mines to the British public, and not out of the gold mined.¹⁵

Considering this, it is not surprising that many of Hoover's elaborate reports recommended abandonment of some mines and the avoidance of dubious propositions. He was ever alert to cost factors.

George Nash reported at length the various criticisms Hoover made about the landscape, the incompetent Australian management and the lazy Australians.¹⁶ He strengthened the workforces where he had control, reduced production costs and avoided unnecessary capital expense. One mine of his supervisory folio was

the Sons of Gwalia mine at Leonora. Notwithstanding frequent conflict with Moreing's West Australian manager, he was able to provide good reports of the mine's potential which had not been recognised previously. Hoover's report included a suggestion for Bewick Moreing and Co to buy the mine, which they did.¹⁷ During November 1897, Hoover was appointed superintendent, effectively manager, where he earned a reputation for ruthlessness. He gained notoriety when he berated and began to sack Australian miners, replacing them with Italians. It was one act which added to the ire of many people, who believed that Bewick, Moreing was on the path to being a monopoly.¹⁸ It seemed like a public display of personal dominance rather than a normal strict managerial decision to weed out lower performers. It was an act which would have warned all miners - particularly those working in the Bewick Moreing camp - that their jobs were in jeopardy, but as the fortunes of Sons of Gwalia improved, it is difficult to be critical.

It seems that Hoover was an example of the hard headed and businesslike mine managers from USA who were assuming a major influence on world mining. The body of Cornish mine captains from the Cornish diaspora of the mid-19th century became reduced in numbers.

China

His technical ability had impressed head office in London leading to an offer of a transfer to China. C.A. Moreing¹⁹ had been in deep discussions with the Chinese in regard to strengthening the financial and technical state of mining in the regions of Chihli and Jehol.²⁰ One of the outcomes was that it was agreed that Bewick, Moreing would provide an engineer having the dual roles of (a) technical advisor to Chang Yen-Mao, and (b) representative of foreign bond-holders who were financing harbour construction work.²¹ Amongst the material being mined in Chihli was gold, but the biggest mine, one which had a strong bearing on Hoover's future, was the Kaiping coal mine.

Hoover gladly accepted the post as it was not only a promotion, but it enabled him to provide a proper home for a wife in more congenial conditions than the hot, dusty plains of the Western Australian goldfields. He proposed to Lou Henry, a former fellow geology student and girlfriend at Stanford, who accepted. He travelled to London to be briefed, then America to marry, then back to China. Herbert, a Quaker and Lou, a Pentecostal were married by a Catholic priest, a mutual friend.

He departed Western Australia with a high reputation as a mine manager, but DeLong suggests that he was also recognised as an 'ambitious, Machiavellian manipulator who had schemed unsuccessfully to supplant his boss'.²²

The massive Kaiping coalmine is situated approximately 150 kilometres east of Peking (now Beijing). It was developed in an area of small coal pits until entreaties to the governor-general of the district resulted in a modern, western style mine being established, with the first shaft being sunk in 1879.²³

In the late 1890s the mining company was experiencing financial and operating difficulties. The manager was Chang Yan Mao, who had not been long in the job and apparently had indifferent business and technical skills. The company was heavily indebted to a German bank, but Chang needed more. He approached Moreing to borrow £200,000 at 12 per cent, and then a further £1 million of equity funds.²⁴

China was a weak nation at the time, for it had fought in several wars against marauding European nations during the 19th century, including two against the British. In consequence of these wars, French, German, English and American traders gained large tracks of land on which they claimed 'extraterritorial rights', meaning no resident Chinese were welcome and Chinese law not recognised: The soil they occupied was effectively foreign. Much of the trade was the sale of opium to China which the Chinese authorities and general population resented strongly. The I-ho Chuan, or in English, *The Society of Harmonious and Righteous Fists* (hence Boxer) rose in rebellion. Both Herbert Hoover and his wife Lou took up arms to support the defence of their pitch. Neither fired a defensive bullet, but it did divert attention from the mining tasks on hand.

Because of under-capitalisation and inferior organisation, Chang came to the conclusion he should seek protection for the enterprise from a friendly foreign power. He considered it necessary to protect the interests of the mine's stakeholders so, in a hurried deal, Hoover was appointed sole trustee of the enterprise. The arrangement was subject to firstly, Bewick, Moreing's approval and secondly, recapitalisation of the enterprise with a further million pounds sterling and reconstituting the company as a joint Sino – British enterprise. The problem with the deal, according to Bewick, Moreing was that there was no provision for promotional fees or compensation for the distribution of shares to Bewick, Moreing or their associates.

Hoover then had to present a revised agreement to the Chinese, which listed Hoover as the agent of Moreing and included benefits for Moreing and other promoters. Chang was apparently dubious, but signed a side agreement with Hoover defining the new company as a joint Sino-British enterprise, with equal say in management between the two nations and having a Chinese board and a London board.

During the next seven months Hoover placed his selected people in key positions and consolidated foreign control in violation of the agreement. Worse still, Moreing disregarded the requirements that the company be recapitalised and instead added a further debt of £500,000 of 6 per cent debentures. A court case ensued and strangely it was decided that the case be heard in London rather than in China. In court it was shown that 625,000 shares had been distributed without compensation for buyers of the new debentures, and only 375,000 shares were left for the original shareholders. The judge had stated that there appeared to be a clear criminal case if the matter was pursued, but oddly, the Chinese withdrew from the case.

Being a young man, it is possible Hoover was not experienced with such major deals and was a pawn in the hands of his masters in London. Whether this was right or wrong, he apparently left China a wealthy man and in 1901 was elected a partner in the Bewick, Moreing firm.

One has to wonder what Hoover's future would have been if the Chinese had pursued their case. It would have been a blow to his personal fortune and his ambition to enter public life. In fact, Brad DeLong relates, Hoover later went to great lengths to cover up his part in the China affair with 'outraged rebuttals' of published accusations²⁵. An agent of Hoover even travelled to England to secure all copies of the trial transcript, although one still remains at Oxford.²⁶

Australia Revisited

His new duties included financial negotiations and reorganisations in various parts of the world. To avoid digression, this narrative will only cover, briefly, two further Australian companies: The Zinc Corporation and the Lake View and Star, both of them proving to be most supportive in Hoover's reorganisations of the Burma mines. It should be mentioned, however, that Hoover did have failures. Lancefield mine in Western Australia and the Loddon Valley debacle are just two. The first of these just didn't live up to expectations and the second, after a series of reorganisations, failed because engineers could not overcome a flooding problem.

Just a few years after the commencement of mining at Broken Hill it was found that increasing quantities of oxidised ore were low-grade and unsuitable for complete separation in smelting.²⁷ There was also a high zinc content, and the series of experiments, varying from partial solutions to more complete solutions to the problem, are well known to mining historians. There was an accumulation of approximately 6 million tonnes²⁸ of valuable zinc rich tailings on hand, which interested some people of influence who contemplated a possible successful industry.

Hoover went to Broken Hill to investigate the application of a flotation process to the residues. In a secretive process of negotiations between one group of men in London, and another in Australia, it was decided to form a company to proceed further, and the Zinc Corporation was incorporated in Great Britain²⁹ on the 9th September 1905. It was considered to be an Anglo Australian company with the founding directors being A. Moreing, H. Hoover, L. Robbins and N. Clark from the UK, together with W.L. Bailleau and W.S. Robinson in Australia.

The research in Broken Hill advanced the flotation process enormously to the degree that lead and silver could be floated selectively from the zinc³⁰. By 1908 the company was profitable after suffering from losses and write-downs of capital in the initial years of experimenting,³¹ It proved to be a new industry of great benefit to Broken Hill.

It is interesting to note that the Great Eastern Mining Company was incorporated in 1902 to salvage lead from huge slag heaps in Burma. Hoover had

been called upon as a consultant to finance and revitalise that company and possibly recognised the benefits of working the Broken Hill heaps.

His growing relationship with senior Broken Hill mining identities, probably operating from Collins Street, proved useful for later investment in Burma, and in fact, a number of staff people accepted positions in that far country.

Another company to invest heavily in Burma was the Lake View and Star, a company formed by the amalgamation of the Star and the Lake View mines. The Lake View was a mine set on a small land area, but had produced early wealth. By 1898 problems were arising with the suggestion in mining circles that the mine would soon have to close, and accusations were made that employees were salting samples. This was followed in 1901 by a letter from the chief engineer to the company board indicting barren ground was found at a lower level. There were disputes between the engineer and others in the company, the suggestion being that the activities were designed to reduce the share price.³²

In 1902 Bewick, Moreing was called in with Hoover as the consultant. The outcome was a revitalised mine and then amalgamation with the Star mine, thus reducing the restrictions which Lake View had with its comparatively small land space. Profits were made and later the new Lake View and Star invested heavily in the Burma Corporation.³³ At the annual meeting of the Burma Corporation in 1916, the chairman, R. Tildren Smith, spoke warmly of Lake View and Star's heavy investment in the Burma Corporation.

These brief notes on the Zinc Corporation and the Lake View and Star are merely to indicate two of several sources of investment in the Burma Corporation from Australia. Hoover had a very strong influence on each of them.

Burma

Burma has a mining history that can be traced back for many hundreds of years, but this article is mainly concerned with the Burma Corporation and its predecessors. Internecine wars between the diverse cultures were prevalent many years ago, and some states still remain at loggerheads with the central government.

The country has extensive rice paddies, rugged mountains, large rivers, crystal clear streams, heavily timbered forests, and, of course, minerals.³⁴ It was a rice bowl for Asia and elsewhere but most people were poor by Western standards.

The mining and smelting operations of the Burma Corporation (and its successors) is centred on a disease ridden, thickly forested mountainous area well north of the well-known city of Mandalay. The mine was at Bawdwin, in high country, and the smelters were a few miles distant on lower country at Namtu, the latter being the administrative centre also. Dacoits³⁵ were a danger, malaria was rampant, and small pox endemic. Many Europeans who came to the district caught malaria and some died, including two young friends of the author. Herbert Hoover was also infected during a visit.

Notwithstanding these conditions The Burma Corporation and its predecessors developed one of the richest mines in the world. Consequently they form the main topic of this paper. It had its main operations in the northern Shan states near Lashio, towards the border with China. In ancient times the Shans were of a similar ethnic grouping to people who lived in Yunnan, which was across the Chinese border, and were known as Tais. The migration of Tais was not just westerly towards the Shan area some years ago, but also to the South to a place known as Siam but now called Thailand.

Chinese records indicate the last consistent working of the mine was between 1796 and 1851 when a small royalty was paid to the king of Burma. Some thousands of Chinese worked in the mine.³⁶

In the early 19th century the East India Company³⁷ was, as ever, concerned with potential competition from the French in Southeast Asia. This was worsened by the Burmese government showing some signs of aggression, particularly in relation to the re-conquering of Assam and other parts along the Indian border. Started in 1824, the war went on for two years before being won decisively by the British, though with a huge loss of life on both sides.

After a second war 30 years later, the Burmese government was obliged, by treaty, to cede large areas of southern Burma to the British - that is the British East India Company. This result not only provided trading ports to the British East India Company but also provided bases for British troops.

The British government assumed full political control of India from the East India Company in 1858³⁸, before the third war, which started in 1873. Thousands of lives were lost again. Mandalay was the Burmese capital at that time and came under attack from British troops. They had taken the sea road across the Bay - where the flying fishes play - from the previously ceded ports such as Moulmein, and then proceeded up the Irrawaddy River by paddle steamers to capture the capital. Burma was formally annexed and placed under the authority of the British-Indian administration, and Indian currency was adopted.

For hundreds of years primitive mines had been operated across Burma, mainly in the north such as the Shan and Wa states. One of the ancient, abandoned mines was at Bawdwin, in the mountainous Northern Shan States. The word 'bawdwin' is Burmese for silver mine, and the Chinese had left this mine in the mid 19th century after working it spasmodically from about the year 1400. Huge amounts of silver for the Celestial Empire must have been removed, leaving great heaps of slag containing enormous amounts of unwanted lead.

Salvaging the lead interested some of the British mining fraternity, who eventually formed the Great Eastern Mining Company in London in 1902. Beyond the share capital, it was necessary to raise further loan money for equipment, particularly for the development of a railway to connect with the main line to Lashio. The British had built the Lashio line for political and military purposes, but a line through very difficult terrain to Bawdwin from a junction was a necessity for the new company.

Burdened by extremely high borrowing costs and interest, the Great Eastern Mining Company found it could not live up to the greatness its name suggests. A dispute arose between the company and its financiers and progress was complicated by the fact that incorrect railway equipment had been sent to Burma. A 50-mile railway to move the ore was vital, but it had to reach Bawdwin through mountainous jungle country. A narrow 2ft gauge track was necessary to traverse the sharp curves, and a zig-zag rise to gain height, though the zig-zag was later changed to a spiral rise. A railway line from Rangoon to Lashio had been built by the British about the turn of the 19th/20th century, probably for political and military reasons. It included the construction of the famous Gotiek viaduct, which the trains travelled over very slowly. This northern line was vitally important to the Burma Mines for a junction with its own line.

Figure 1: *Burma Corporation's spiral railway rise, adjacent to Bawdwin.*



Source: The album of the late George Rogers, formerly of the Burma Corporation.

The company became in dire need of further finance, as well as a higher level of management expertise. There were strong differences of opinion amongst directors and financiers, resulting in the feuding parties approaching Herbert Hoover of Bewick, Moreing and Company for possible assistance.

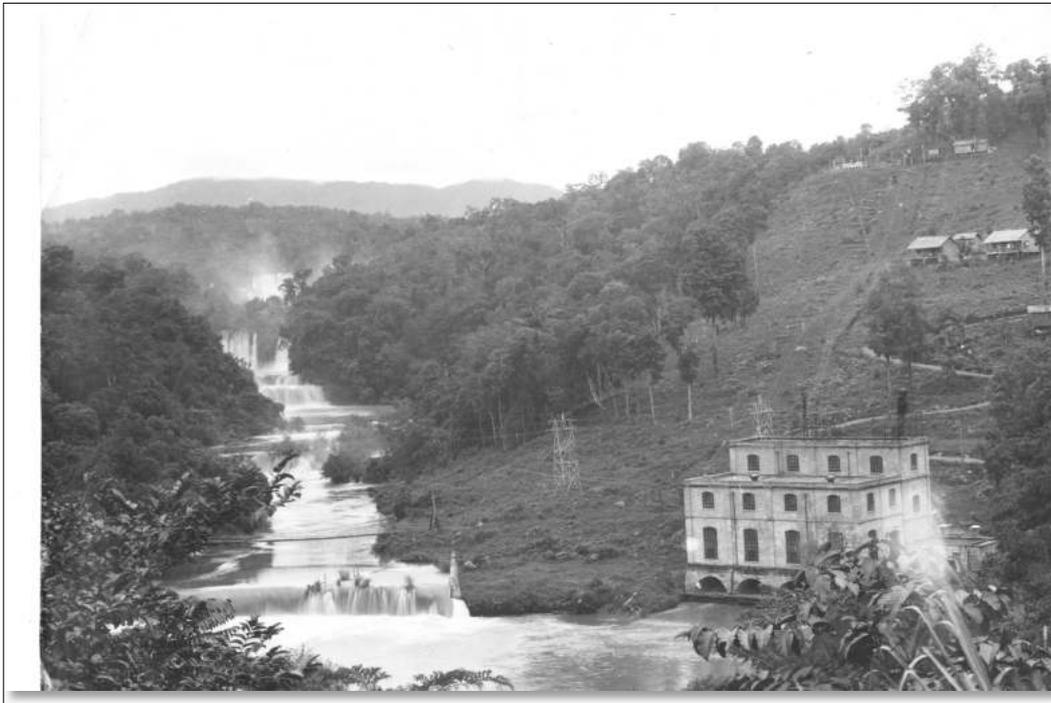
It was Hoover's fame and efficiency that attracted the approach to him by the Great Eastern Mining Company during its extremely difficult period. The new connection resulted in Bewick, Moreing taking an option for a controlling interest in the Great Eastern Mining Company and subsequently, sending C.S. Herzig from its company's senior Australian staff, to inspect and appraise the mine.

Herzig reported a vast amount of lead in the slag heaps ready for smelting, as well as an indication of huge wealth of precious metal in sulphide ores lying below the water table. The former Chinese operators did not have the means to pump high volumes of water.

Herzig estimated £100,000 sterling would be required to set the business on a successful path - a lot of money for those days. The cost of the 50-mile narrow gauge railway to connect with the main government line was included in this sum.

Having gained control, Bewick, Moreing sponsored the formation of a new company in 1906, The Burma Mines, Railway and Smelting Company to take over the Great Eastern Company. The company later amended its name to The Burma Mines.³⁹ Hoover expressed the opinion that a new, maybe bigger Broken Hill was born. An encouraging statement for investors!

Figure 2: *Mansam Falls and Power Station: one of three hydro-electric and one diesel power station owned by the Burma Corporation*



Source: The album of the late George Rogers, formerly of the Burma Corporation.

A quick comparison of available figures has indicated that from 1885 to 1955 all the companies on Broken Hill's lode produced an average of 889,727 tons of ore per year.⁴⁰ This is compared with the one mine at Bawdwin, which averaged 803,700 tons over a known two-year period⁴¹. Annual silver production for the same periods was 6,650,137 fine ounces and 5,971,114 fine ounces respectively. It is impossible to estimate the amount of silver removed by the Chinese during the previous 500 years.

To return from the digression: this second Company decided to build smelters at Mandalay, situated on the navigable Irrawady River, 200 miles distant

from Bawdwin. The construction of the Mandalay smelters used mainly Burmese women coolies.

It was firmly believed that no smelting could be done until the company's 50-mile spur line of narrow 2ft gauge railway was completed to Bawdwin and this was proving to be far more difficult and expensive than had been estimated. The delay meant there was no ore to smelt until 1909 and even then, the ore had to be transported by bullock wagons for nine miles to a temporary railhead. Eventually the line was completed and rail trucks could be loaded from the hoppers at Waller Gorge, near the mine.

Further difficulties prevailed. There was flooding of the Mandalay smelters during storm periods and there were continuing transport hold-ups. Finally, in 1911 the smelting operation was moved from Mandalay to Namtu, which was reasonably close to Bawdwin, and situated on the Namtu river.

For about the next four years the company struggled to pay its way. At one stage, there was tremendous storm damage at Bawdwin, there was a labour shortage because of a default on the payroll and most disturbingly, the rich ore from the mine was found to be complex and refractory; not suitable for smelting as anticipated. The large, rich ore body found below the old Chinese workings could not be utilised unless a successful method of treating or smelting could be found. Fortunately the company had income from the smelted lead from the old Chinese slag heaps but these reserves were almost spent. The Burma Mines was heading for insolvency unless further capital was raised, so it was a disastrous time, notwithstanding the enormous wealth to be won.

A hundred years ago the geological development of the ore body was described by J.D. Hoffmann as follows:

The ore body occurs in an ancient volcanic series, in part under a sedimentary capping, and that it was formed through replacement, presumably by ascending deep seated waters near the locus of important fault planes, where a coarse tuff afforded a particularly favourable habitat.⁴²

Extremely long adits or tunnels, one known as the Chinaman tunnel and another as the Tiger tunnel were extended to the ore bodies.

The smelting problem was solved, possibly by the use of ironstone as a flux; with a large reserve of ironstone being available at Namtu. It came from company owned ironstone mines, which had been developed at Wetwun and Naungkathaw, about 80 miles south of Namtu. Nash states that more than 7,000 tons of ore was sent from Burma to European smelters for experimenting⁴³ and that this was eventually successful. Hoffmann provides the more plausible account as though a statement of fact. He states that a large tonnage of ore was shipped to the Zinc Corporation at Broken Hill where promising flotation tests encouraged the building of a test plant at Namtu, which was later enlarged.⁴⁴

Hoover and others became dissatisfied with some of the directors and management of the mine, and particularly with Bewick Moreing and Company.

Hoover had resigned from his partnership in that firm sometime previously and felt there had to be a reorganisation. He had calculated an extra £300,000 of additional capital was needed and on 27th of September 1913, he and his fellow financier R. Tildren Smith announced plans to form a new, third, company – the Burma Corporation. Arrangements were made to transfer Burma Mines shares into the Burma Corporation, which would control the Burma Mines.

The Burma Corporation was created on 9 October 1913, with the authorised capital of £750,000, and within six weeks two-thirds of the shares in the new company had been issued. The largest shareholders were Hoover and his business colleagues, including financier Tilden Smith and some companies in which Hoover had a controlling influence, such as the Lakeview and Star Company and the Intercontinental Trust and other Australian interests. Hoover achieved the dominant position in the new Burma Corporation. In April 1914, the authorised capital was raised to £1,000,000.

Naturally, the company searched for opportunities away from the main Bawdwin mine. Other exploratory work was carried out, some needing highly organised expeditions. One such expedition was conducted in 1934, or 20 years after the period on which this article is based. The author's father was one of the leaders of this march to ancient Chinese mines in the Wa States.⁴⁵ At that time the Wa's were still head-hunters, but apparently stopped practicing this barbaric act in 1966. Producers of mainly opium and rice, it is claimed that they believed a head on a stake ensured a better crop. They were animist in their religion, though many of them accepted Christianity.

Hoover was already a very wealthy man when the Burma Corporation came into being. He became chairman of the board of directors of the new company and was now poised to make an additional fortune – a tremendous feat for a man in his early 40s.

Herbert Hoover was still an American citizen at the outbreak of the Great War in 1914 and therefore had no obligations to Great Britain, as the USA was not a participant in the war at that time. He therefore turned to organising vital humanitarian supplies to Belgium as the Germans ravaged that country, while his business associate, R. Tildren Smith became chairman of the Burma Corporation.

Herbert Hoover became more widely noted for his philanthropy as he got older and indicated an interest in entering public life when comparatively young. He fulfilled that desire by eventually becoming President of the United States of America.

The Burma Corporation is rarely heard of these days. When the Japanese invaded the country in 1943 it became necessary to evacuate the Europeans of the company. The women and children were flown out of the country for safety. The men, led by Frank Espie, the general manager, were obliged to walk through jungles, over mountains and across plains to India. Frank Espie and others returned to Adelaide. The mines were reopened after the war by the Burma Corporation, but the share structure changed after independence, and in 1965, the company was nationalised and foreign visitors banned from the area.

Endnotes

- ¹ Herbert Hoover Presidential Library and Museum, *Herbert Clark Hoover: A Biographical Sketch*, viewed at: www.hoover.archives.gov/education/Hooverbio.html, 1983, p.1
- ² *Ibid.*
- ³ George H. Nash, *The Life of Herbert Hoover: The Engineer* W.W. Norton & Co., New York, 1983, p. 17. Nash was commissioned by the Hoover Library and Museum to write Hoover's biography, which eventually consisted of 4 large volumes. He reported the good and the bad without personal comment.
- ⁴ Hoover, *A Biographical Sketch*, p. 1.
- ⁵ Nash, *The Life of Herbert Hoover*, p. 46.
- ⁶ *Ibid.*
- ⁷ *Ibid.*, p.47
- ⁸ Unit conversions used in this paper are as follows: 1 inch = 25.4 mm, 1 foot = 0.3048 m, 1 mile = 1.609 km, 1 ton (long) = 2,240 pounds (lbs) = 1.01604 tonnes,
- ⁹ Nash, *The Life of Herbert Hoover*, p. 50.
- ¹⁰ The Western Australian Museum, *Building a Pipeline*, viewed at: www.museum.wa.gov.au/explore/wa-goldfields/water-arid-land.html. Updated 2015, p.1.
- ¹¹ The Western Australian Museum, *The Rush for Gold*, viewed at: www.museum.wa.gov.au/explore/wa-goldfields/water-arid-land.html. Updated 2015, p.1.
- ¹² *Ibid.*
- ¹³ 'Hoover, Herbert Clarke (1874-1968)', *Australian Dictionary of Biography*, vol.9, Melbourne University Press, 1983, viewed at: www.adb.anu.edu.au/biography/hoover-herbert-clark.html, p.1.
- ¹⁴ Nash, *The Life of Herbert Hoover*, p. 1.
- ¹⁵ Editorial, 'Excessive share issues', *The Western Mail*, Perth, 23 August 1895, p. 9.
- ¹⁶ Nash, *The Life of Herbert Hoover*, p. 60.
- ¹⁷ *Ibid.*, p. 65.
- ¹⁸ *Ibid.*, p. 329.
- ¹⁹ Claude Algernon Moreing was born in NSW but educated in England, which became his homeland. He was employed when young by Bewick, a contract mine manager and finance broker, and eventually became a partner in the business to form Bewick, Moreing and Co.
- ²⁰ Nash, *The Life of Herbert Hoover*, p. 83.
- ²¹ *Ibid.*, p. 95.
- ²² Brad DeLong, *Herbert Hoover in China: A Story I Had Never Heard Before*, Viewed at: www.delong.typepad.com/delong.economiconly/.../herberthoover.html p. 1.
- ²³ 'Tangshan', *Encyclopedia Britannica*, viewed at: www.britannica.com/place/Tangshan.html, p. 1.
- ²⁴ Nash, *The Life of Herbert Hoover*, p. 112.
- ²⁵ De Long, *Herbert Hoover in China*, p. 1.
- ²⁶ *Ibid.*
- ²⁷ R.J. Solomon, *The Richest Lode*, Hale & Iremonger Pty Ltd., 1988, p. 65.
- ²⁸ *Ibid.*, p. 70.
- ²⁹ *The Zinc Corporation and New Broken Hill Consolidated, Company Publication*, 1948, p. 15, viewed at: www.digital.slv.vic.gov.au/dtl-publish/pdf/marc/47/773209.html
- ³⁰ *Ibid.*, p. 15.
- ³¹ *Ibid.*
- ³² Editorial staff, *Lake View and Star*, see www.mindat.org/loc-6642.html, p. 1.
- ³³ 'Address by R. Tilden Smith, chairman of Burma corporation', *Kalgoorlie Western Argus*, 11 January, 1916, p.10.
- ³⁴ H.L. Chibber, *Mineral Resources of Burma*, McMillan & Co., London, 1934, p. 36.
- ³⁵ Dacoits is a name used in India and Burma for groups of bandits.
- ³⁶ J.D. Hoffmann, 'The Bawdwin Mines', *The Mining Magazine* 1916, p. 140.
- ³⁷ Often referred to as the British East Indian Company to avoid confusion with a Dutch company of similar name and which traded to the Dutch East Indies - now Indonesia.
- ³⁸ V.I. Smith, *The Oxford History of India*, 1976, p. 634.
- ³⁹ J.D. Hoffmann, 'The Bawdwin Mines', p. 141.
- ⁴⁰ R.J. Solomon, *The Richest Lode*, p. 68.
- ⁴¹ The Burma Corporation Ltd., *Annual Report 1934*.
- ⁴² J.D. Hoffmann, 'The Bawdwin Mines', pp. 143-4.
- ⁴³ Nash, *The Life of Herbert Hoover*, p. 421.
- ⁴⁴ J.D. Hoffmann, *Ibid*, p. 146.
- ⁴⁵ G. Rogers, *Personal record of the Wa State expedition*, 1934, unpublished.