

‘Thackaringa’: First step to Broken Hill

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The Broken Hill silver-lead-zinc deposit is one of the largest and most famous ore deposits in the world. This unique orebody has played a pre-eminent role in the mining history of Australia and also in the history of industrialisation of the nation.¹ As the deposit was progressively developed and its immense scale revealed, the resulting innovations and breakthroughs in mining and ore processing technologies became globally significant. The discovery and mining of Broken Hill has shaped or touched many aspects of the Australian way of life.²

Reflecting its importance, the history of discovery and mining of the Broken Hill deposit is well documented.³ Less well known are the details of how earlier discoveries of silver-lead in the Barrier Ranges attracted interest and observation that led to discovery of ‘the big one’. What was it that first drew attention to the mineral wealth of this remote and waterless region? Initially it was a belief that the area was ‘mineralised’, as suggested by the widespread abundance of surface quartz and quartz veins. This common, if generalised notion was based on the knowledge that quartz veins are introduced into rocks by fluids and may contain gold and other metals. Not surprisingly, the first interest was in gold, and in 1858 the South Australian Government sponsored a prospecting party, led by Captain James Crawford, to search for gold in the Barrier and Grey ranges. The expedition was unsuccessful, but belief persisted, and in 1867, aided by rumour and skulduggery, there was a gold rush to the area of Poolamacca Station, known as the ‘white quartz rush’.⁴ This proved to be a ‘schicer’ or hoax, but in 1881 payable gold deposits were found further north in the Grey Ranges at Mount Browne and Tibooburra.⁵

It would be a discovery by an observant tank sinker, followed up by a local publican and a Menindee storekeeper that would demonstrate the presence of payable silver-lead ore. This sparked further interest that drew experienced and not so experienced prospectors to the region, leading to the establishment of a silver-lead mining field and ultimately discovery of the world class Broken Hill silver-lead-zinc lodes.

First discovery of silver-lead

The first indication of silver-lead mineralisation in the Broken Hill region came in late 1875 or early 1876 with the discovery of galena by Julius Nickel while he was working with his mate Dan McLean, as a tank sinker on Thackaringa Station, 16 km east of the New South Wales - South Australian border (Fig. 1).⁶ Nickel spent a good deal of his spare time prospecting for gold, but he was unsure of the galena (lead sulphide) that he had found. He showed a sample to John Stokie, owner of the Old Thackaringa public house during one of his Saturday night visits to the pub. Stokie recognised that the galena sample was probably silver-bearing and suggested that he could interest his

friend Patrick (Paddy) Green, a Menindee storekeeper, in helping to finance a mine. Nickel declined the offer and caught the fortnightly coach to Adelaide to visit friends and possibly consult mining experts. While Nickel was away, Stokie managed to locate the discovery site after four days of searching and wrote to Green in Menindee telling him of the find. He pegged a claim before riding to Menindee to register two 40-acre blocks on the 3rd and 5th June 1876. Patrick Green then travelled to Thackaringa with his friend William Maiden and pegged an additional block adjoining Stokie's in early July.⁷ Green and Stokie agreed to form a partnership and develop a mine, which they called the Pioneer.⁸ Stokie had a sample of the galena assayed by Andrew Thomas, an Adelaide assayer, which revealed 72 percent lead and 49 ozs of silver to the ton.

Two copper miners from Wallaroo or Burra, including one named Harry Slater, were engaged to mine about 35 tons of ore, which was then transported by three of William Maiden's teams to Menindee, where it waited some time until the Darling River rose. The bags of ore were then shipped to Adelaide by paddle steamer and sent by Elder, Smith and Co. to England as ballast on a wool ship. Most of the ore was thrown overboard when the vessel sprang a leak and it was thought that the hull had been strained by the dead weight. However, five tons were saved and tested in England, to reveal the ore was payable. Before receiving the news in 1878 Stokie had been persuaded to abandon the enterprise, particularly given the remote location and cost of transport, and Patrick Green had died.⁹

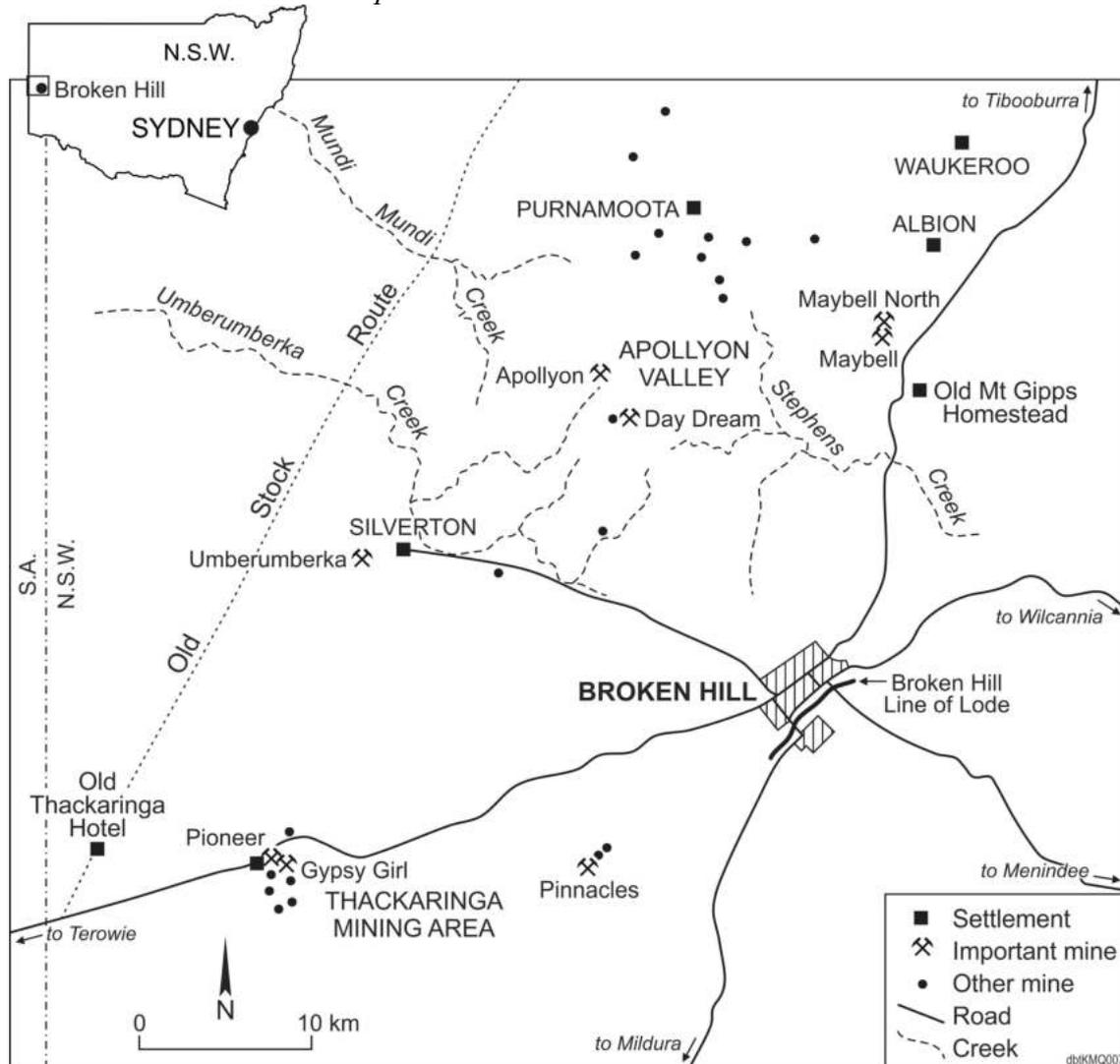
At this time Thackaringa was a stopping place for teamsters, drovers and other travellers on their way to and from the newly opened pastoral areas in the west Darling region of New South Wales. It formed a junction of bush tracks linking Terowie in South Australia to Wilcannia and Menindee and later Milparinka.¹⁰ The settlement was on the Thackaringa pastoral property of Elder, Smith and Co. and comprised the one small public house operated by John Stokie. When J.C.F. Johnson passed through in early 1881 he noted that 'the only nectar obtainable was 'fighting rum' guaranteed to kill as far off as a Greener gun, and sherry liberally diluted with yellow dam water'.¹¹ Nevertheless, it must have been a convivial place, as the men from the Darling found it hard to go past and it was not unusual to see flocks of sheep held up at Thackaringa for days on end while the drovers were too drunk to take to the road.¹² The silver-lead discovery lay 9.7 km to the east, and later the town of Thackaringa was set up near here to cater for the influx of miners (Fig. 1).

The Pioneer Mine lay idle until 1881 when the Mount Browne gold rush occurred and Richard Green (brother of deceased Patrick) applied for a number of mineral conditional purchase claims over the mine and surrounding area. Aimé Garot from Wilcannia took up adjacent claims, including one named the Gypsy Girl. Work recommenced at the Pioneer with two miners in April 1881 and by September, 100 tons of ore had been raised and shipped to England for treatment.¹³

Other prospectors were soon attracted to Thackaringa and more than 30 silver-bearing lodes were discovered in a radius of about 6.5 km. These were all of similar character, consisting of narrow lenticular veins of gossanous material with lead carbonate and galena. The major claims included the Pioneer, Gypsy Girl, Lady Brassey, Hercules, Goat Hill, Homeward Bound and Dan O'Connell. Much of the early mining

was by shallow open-pitting of surface ore, generally referred to as ‘pig-rooting’.¹⁴ In 1883 there were 130 men working on the Thackaringa mines, and a new settlement developed to become the township of Thackaringa (Fig. 2). The town quickly grew to a population of about 300, with a hotel, store, police station, postal service and school. Drinking water was obtained from a government tank 35 km away, across the border in South Australia at £2 per 100 gallons.¹⁵

Figure 1: Map of the southern Barrier Ranges showing the location of the Thackaringa and other silver deposits in relation to Broken Hill.



Source: Drafted by the author from A.C. McDonald, *Plan of Barrier Ranges Silver Field*, 1886 and R.H.B. Kearns, *Broken Hill 1883-1893*, Broken Hill Historical Society, Broken Hill, 1996.

Ore from the Thackaringa mines was bagged and transported by bullock dray 320 km to Terowie in South Australia at a cost of £3 12s 6d to £4 10s per ton. It was then taken by rail to Port Adelaide and shipped as ballast to England for smelting. Most of the ore was consigned to Elder, Smith and Co., who advanced £3 to £4 per ton to the miners on the field and also covered the cost of transport to Europe. The total cost of transport was about £9 per ton, which for the average grade of ore left a profit of £5 to £7 per ton, equivalent to a gold mining operation yielding about 1.5 ozs per ton.¹⁶

Initially the miners handpicked the obvious and attractive galena-rich ore, not recognising the much richer, dull brown and grey silver chlorides, which they discarded. It was the assayers and smelters in England who first discovered the presence of silver chlorides in some of the consigned ore.¹⁷ At the Pioneer mine a number of near-surface lodes 0.5-1.8 m wide were discovered, with selected chloride-rich samples reported to assay up to 3,000 ozs of silver per ton.¹⁸

Figure 2: *Thackaringa mines 1883, showing mining methods and settlement in background.*



Source: L.S. Curtis, *The History of the Broken Hill: Its Rise and Progress*, Fearson's Printing House, Adelaide, 1908, p. 5.

In September 1884, when Charles Wilkinson, New South Wales Geological Surveyor, inspected the Thackaringa mines, there were about 50 miners and the total production had reached 2,086 tons. At this point the workings consisted of small quarries and shafts down to 27 m. At the Pioneer mine he reported that eight lodes containing galena, lead carbonate ore and ironstone had been worked and according to the manager, Mr S. Roswell, about 700 tons had been raised in the previous 12 months.¹⁹ Wilkinson also observed prospecting and small-scale mining activity at the separate Goat Hill, Hercules, Nevada, Bonanza and Comstock lodes. Production at the Gypsy Girl mine had been impeded by legal issues (see below).

At the start of the silver share boom in 1887 the Pioneer mine was purchased by a consortium that included William Jamieson, W.P. McGregor and W.R. Wilson, all shareholders at this stage in the Broken Hill Proprietary mine. This was a time of great optimism on the field, resulting from the imminent connection of the private Silverton tramway with the South Australian railway, which had reached the border with New South Wales. It was hoped that cheaper transport would allow the working of lower

grade ores, not possible before this time. The Pioneer mine was floated as the Pioneer Silver and Lead Mining Company. Over four years this operation shipped about 1,800 tons from an estimated 11,000 tons of mined ore, but was not a success due to difficulties with a new concentrating plant and shortages of water. Deeper mining of the primary ore meant that the silver grades were lower and required efficient concentration. In December 1891, co-incident with the ‘silver crisis’ crash, the company was wound up.²⁰

Small-scale mining at Thackaringa continued intermittently until 1909 and in 1923–25. The main producers were the Pioneer and Gipsy Girl mines, with total ore production estimated at 20,000 and 10,000 tons respectively. Production from the other deposits ranged from a few tons to 1,000 tons of handpicked ore.²¹ Subsequent intermittent prospecting around these deposits, including in the 1970s, found no significant remaining ore.²²

Further discoveries

After his initial mining activity at Thackaringa and perhaps encouraged by the tardy news that the ore was payable, John Stokie continued to prospect in the region and in 1881 he discovered another silver-lead deposit 17 km to the north of Thackaringa, at Umberumberka, where he had taken up a selection in 1879 and built a store (Fig. 1).²³ With Edward Pegler he pegged the ground in November 1881 and a 100-ton parcel of ore was mined and shipped to England for a 40 percent profit.²⁴ The following October the Umberumberka Silver Lead Mining Company Ltd was floated with nominal capital of £20,000 in 20,000 £1 shares, with 4,000 shares allocated to the vendors.²⁵ Umberumberka was the second area of silver-lead mineralisation discovered in the Barrier Ranges and the new company the first on the field to be publicly floated.

From November 1882 until early 1886, under the management of Captain E.P. Evans, the Umberumberka mine employed up to 40 men underground, 30 on the surface, and produced 5 tons of ore a day (Fig. 3). By March 1886 it was the deepest mine in the Barrier Ranges at 100m, with 427m of drives on a number of levels. To this date, over 1,800 tons of ore had been mined and 1,400 tons shipped for treatment.²⁶

A cluster of dwellings and huts developed near the Umberumberka mine, but soon a larger settlement was set up 3.2 km to the east on a more suitable site with better access to water. For a time this township was considered an offshoot of Umberumberka, but in 1883 the name was changed to Silverton. This soon became the main settlement for the growing silver field.

Between 1883 and 1885 numerous silver-lead veins were discovered northeast of Umberumberka, particularly in the Apollyon Valley and further north, near Purnamoota (originally known as the Soakage or Leadville). Although these deposits were rich in silver, some grading up to thousands of ounces per ton, most were small near-surface zones of secondary silver minerals, commonly referred to as ‘horn silver’, and most of the mines were short lived. They did, however, attract much interest to the region, stimulating further prospecting, discovery and investment. The settlement of Purnamoota became a centre for small mining operations; many with exotic names such as the Apollyon, Black Prince, White Princess, Lubra, Victory, Terrible Dick,

Purnamoota, Bird in the Hand and the War Dance (reputedly so named when a group of drunken brokers danced naked around the claim). At its height, Purnamoota had a population of 400 with two stores, two hotels, police barracks, school, branch of the Commercial Bank of Sydney and a post-telegraph office.²⁷

Figure 3: *Umberumberka mine ca. 1900.*



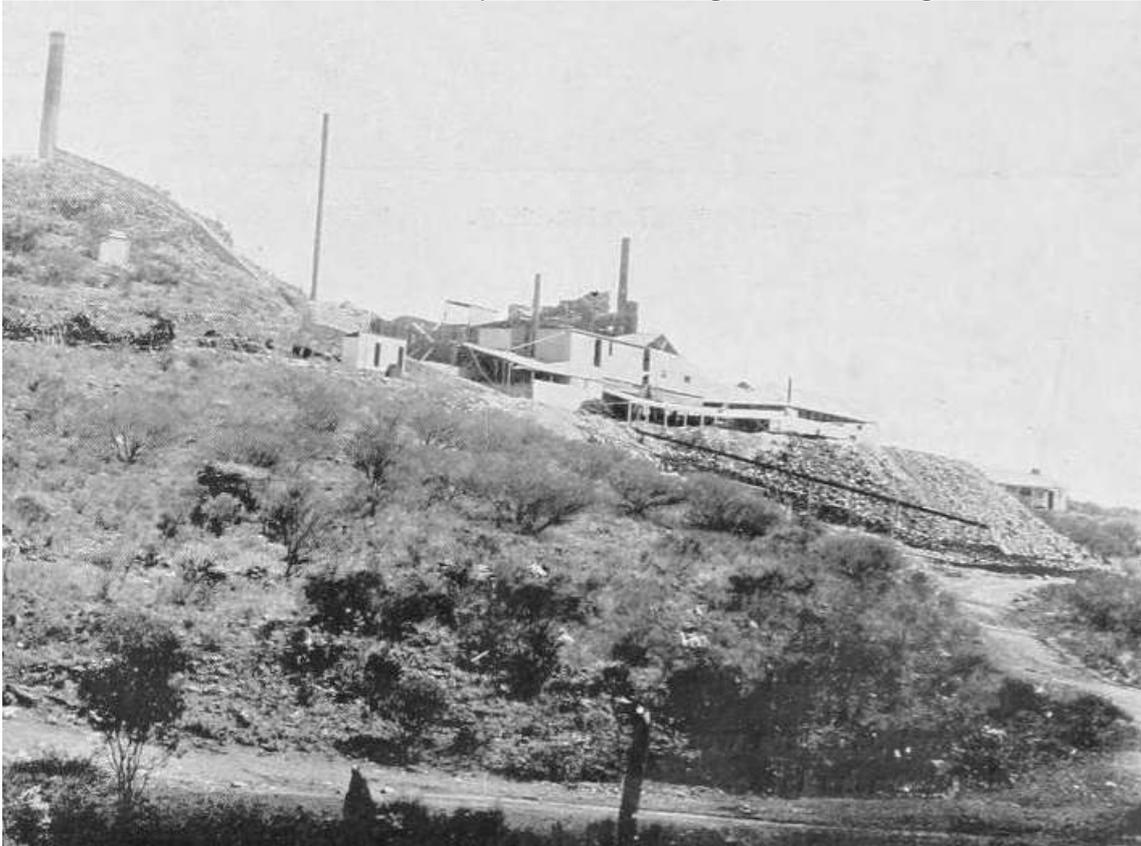
Source: State Library of South Australia Photo Collection.

During this period the population of Silverton rose from 250 in 1883 to 3,000 in 1885 with the town boasting numerous stores, seven hotels, an American saloon, two breweries, three banks, post and telegraph office, three churches, a small hospital, a school, stock exchange and its own newspaper, the *Silver Age*.²⁸ At the peak of the silver-prospecting boom in 1884, Silverton was crowded with prospectors and swindlers, and no doubt some with the skills of both. It was not uncommon for men to carry a ‘slug’ of rich silver ore in their pocket to impress the gullible of their latest discovered ‘bonanza’ or to obtain a grubstake from the storekeepers. It was generally referred to as ‘travelling on the slug’.²⁹ A visiting correspondent from Adelaide was astounded by the hard-drinking culture prevalent in the town. On the night of his arrival he attended a ‘ball’ and noted that ‘dress clothes were not needed – you would be admitted if only disguised in liquor’.³⁰ There was much hype about the prospects and optimistic comparisons were made with the Nevada silver fields.³¹ By August 1884 more than 520 claims had been registered in the Barrier Ranges, but many were speculative gambles with little work on the ground.³²

Some substantial deposits were found, such as the Day Dream discovered by Joseph Meech in December 1882.³³ This was a distinctly coloured outcropping, ‘blow’, which Meech noticed upon awakening from a snooze, while resting near the site during the midday heat. A dispute over the claim delayed mining until August 1884 when about a dozen men worked a quarry on a 1.5m thick lode that assayed about 500 ozs of

silver per ton.³⁴ The mine was then acquired by the Barrier Ranges Silver Mining Association, which built the first smelter in the region at the adjacent Hen and Chickens claim in June 1885 (Fig. 4). By 1886 the smelter works consisted of two La Monte water jacket furnaces with a capacity of 30 tons per day, as well as a refinery with six muffles and wind furnaces for producing silver bars.³⁵ Production from the Day Dream mine between 1884 and 1889 totalled 8,487 tons, with additional ore mined intermittently at later dates.³⁶

Figure 4: *Smelters at the Day Dream mine 1885. This was the first smelting plant constructed in the Broken Hill area by the Barrier Ranges Silver Mining Association.*



Source: L.S. Curtis, *The History of the Broken Hill: Its Rise and Progress*, Fearson’s Printing House, Adelaide, 1908, p. 9.

In July 1883 Allen Sinclair, initially a partner with Joseph Meech, opened a lode along the side of a ridge 4 km northwest of the Day Dream.³⁷ By May the following year the Apollyon mine had been developed with two shafts to 50m connected by two drives.³⁸ W.R. Wilson purchased most of the shares in this mine from Horn and Sinclair, the original holders, and in 1884 the operation was incorporated into the Barrier Ranges Silver Mining Association holdings.³⁹ This became one of the more important high-grade mines in the Apollyon Valley. The mine closed in 1889 having produced around 550 tons of ore mainly from above the 60 ft level.⁴⁰

The Barrier Ranges Silver-Mining Association was formed in June 1884 to amalgamate and capitalise the interests of an Adelaide syndicate headed by W.R. Wilson, and a Melbourne syndicate represented by Messrs Brigham and Marshall. This group with nominal capital of £320,000 was able to acquire and develop a number of

the larger vein deposits, including the Day Dream, Hen and Chickens, Apollyon and Gipsy Girl mines.⁴¹ In the same month a giant 'slug' of rich secondary silver ore weighing 117 kg and valued at £330 was discovered by Jack Morris on the Orion claim near Purnamoota. This was exhibited in Silverton, Adelaide and Melbourne before being sent for smelting.⁴²

The Maybell lode was discovered by moonlight in June 1884, when Julius Nickel, the galena finder of Thackaringa, was travelling to Mount Gipps Station.⁴³ He saw a promising ironstone outcrop and decided to camp on it for the night. The next morning he chipped a boulder to reveal the distinctive 'horn silver'. The Maybell mine was floated into a company in late 1884, and was the first on the Barrier to pay a dividend. By early 1886 about £15,000 worth of ore had been mined.⁴⁴ Subsequently Nickel discovered the rich Maybell North claim, following observation of a 'slug' of silver ore about the size of a walnut. The lode at this mine was only 5-25 cm wide, but one shipment of ore to England gave the extraordinary return of £1,492 per ton.⁴⁵ Additional settlements were established to service these widely scattered claims at Day Dream and Lakes Camp, near the Day Dream mine, and at Nickelville, near the Maybell and Maybell North mines (Fig. 1).

The claim jumpers

When the initial Thackaringa claims were re-pegged in 1881 they were taken up as Mineral Conditional Purchase (M.C.P.) claims. Unknown to the prospectors, the Thackaringa area had just been included within the recently proclaimed Albert Goldfield, centred on Mount Browne 270 km to the north.⁴⁶ Under the New South Wales mining regulations at this time, an M.C.P. claim could be taken up as a 40-acre block on agricultural squatting leases if a specified distance from a homestead. On making certain improvements and paying an additional 30s per acre, the property could become freehold title with the mineral rights. However, an M.C.P. could not be taken up on a proclaimed goldfield and instead a Mineral Lease had to be applied for. The NSW Department of Mines allowed selection of the M.C.P.'s and took the fees and was preparing to issue titles when the error was discovered. There were also some conflicted clauses in the legislation resulting in a complicated technicality and clearly there was no intent by the claimants to work their claims for gold.⁴⁷ News and rumours of this oversight and technicality leaked out and very quickly many of the claims were 'jumped' and re-pegged as mineral leases on the grounds that the original titles were not valid.

An early claim jumper was Samuel Smith (also referred to as Schmidt), who applied for a mineral lease over the Gipsy Girl mine. The official story is that Smith, while travelling from Jamestown in South Australia to the Albert Goldfield, passed through Thackaringa and observed that the newly opened mine, with good ore in sight, was idle. After pegging his claim, which was granted, it was realised that the area covered part of the M.C.P. claim of Aimé Garot, including the Gipsy Girl mine.⁴⁸ Nevertheless, Smith commenced mining. In November 1882 the Mining Warden ordered both parties to suspend operations pending a decision by the Department of Mines, but Smith seized a quantity of ore at Terowie mined by Garot and also mined 30

tons of additional ore, which he sent for processing. In April 1883 Garot obtained an injunction in the Equity Court restraining Smith from working the Gipsy Girl mine, until the title issue could be resolved.⁴⁹ In the meantime a syndicate had been formed, which included prominent capitalists and speculators from Melbourne and Sydney, as well as some members of the New South Wales and South Australian governments.⁵⁰ Many of the claims in the district were re-pegged as mineral leases by this group and other parties. The leases were not granted, but there was much uncertainty about the validity of the initial mineral conditional purchase claims. At the monthly Mining Warden’s Court held in Silverton in March 1884, sixty-four cases involving disputed claims were heard over two days. All of the claim jumpers involved in this hearing withdrew their claims, most being glad to avoid the risk of being charged for trespass.⁵¹

In June 1885 the Supreme Court of New South Wales decided a test case (*Wood vs Scott*) in favour of the jumpers.⁵² After this decision, government members of the Syndicate withdrew their names from the prospectus and in October 1885 the Minister for Mines, J.P. Abbott, brought in a bill to clarify the law regarding M.C.P. claims and validate the original titles. The sudden dissolution of the New South Wales Legislative Assembly in January 1886 prevented the bill from being carried into law and in the meantime the titles issue went unresolved.⁵³ It was finally resolved on the 14th October 1886, with passing of the ‘Crown Lands Titles and Reservations Validation Act of 1886’.⁵⁴ The bureaucratic bungle and delay in resolving the issue resulted in much uncertainty and litigation and seriously hampered the development of several mines, with serious consequences for the owners. It did however create much publicity in the city press about the Barrier Silver Field helping to attract more interest, prospectors and investors.

The ‘broken hill’

On the 3rd of September 1883, boundary rider Charles Rasp, assisted by two dam sinkers, David James and David Poole, pegged a mining lease over a prominent outcrop of manganiferous ironstone generally referred to as ‘the broken hill’. Rasp, whose prior name was Jerome von Pereira, had come to Mount Gipps Station in 1879 and was probably well aware of the strange hill located on the southern portion of the station before he pegged it in 1883.⁵⁵ By this time others were also aware of the hill, but the immense gossan did not resemble the small, surface-enriched silver deposits of the region. Perhaps spurred on by the upsurge of mining activity, the evidence that ores could now be profitably transported to South Australia, as well as his awareness that the outcrop appeared mineralised, Rasp had decided to take a closer look. It is widely reported that he thought the exposed black and heavy mineral might be tin oxide.⁵⁶ This may have been the case as he did include tin, as well as silver and lead, in the list of metals intended to be covered by the mineral lease, and assayed in his samples.⁵⁷

After the initial claim was lodged, Rasp informed his employer, George McCulloch, manager of Mount Gipps Station, who suggested that they set up a syndicate of seven members from the station to each contribute £70 and to claim a larger area over the hill. Six additional leases were pegged and the seven claims registered as blocks 10 to 16. It is interesting that Rasp pegged the first claim on Broken

Hill before informing his employer. He was probably aware of what had happened to fellow German Julius Nickel at Thackaringa when he announced his discovery before pegging the ground.

The 'broken hill' was perplexing. It was so unlike the narrow galena veins and secondary silver enrichments of Thackaringa and the Apollyon Valley that it was derisively referred to by many as the 'hill of mullock'. If the huge ironstone outcrop was indeed a gossan the lode would have to be huge, at least 4 km long and up to 40m wide. Initial assays were disappointing, indicating small amounts of silver (2-3 ozs/ton) and some lead. Charles Wilkinson from the NSW Geological Survey inspected the lode in September 1884, followed shortly by geologist Norman Taylor from Melbourne, both were a little hesitant, but pronounced the deposit 'promising'.

The area was gripped by drought and there was limited activity on the Broken Hill leases until October 1884 when miners were engaged to sink the Rasp shaft. Earlier, the syndicate had agreed to divide their shareholding into 14 shares, so that each member had two shares and could sell one or more, as long as the other shareholders were given first offer of purchase. The shareholders changed to include William Jamieson, W.R. Wilson, Bowes Kelly, Kenric Brodribb, James Daglish, Samuel Hawkins, Solomon Wiseman, W.C. Palmer and A.W. Cox.⁵⁸

The Rasp shaft was in a poor section of the gossan and initially little was discovered. However, in January 1885 one of the shareholders, Philip Charley, noticed silver chloride in waste material from the shaft.⁵⁹ This was a turning point in the history of Broken Hill, indicating the lode contained the much sought after 'chlorides'. Soon more substantial zones of secondary silver ore were found, including massive cerargyrite and silver-rich kaolin, first observed by Harry Campbell, an aboriginal worker employed by William Jamieson.⁶⁰ This gave the syndicate the confidence and credibility to float the Broken Hill Proprietary Company Limited in August 1885.⁶¹ Work commenced in earnest, and by the end of 1885 rich ore had been transported for smelting and the company began to earn its first revenue. Such was the richness of the ore that the mine was virtually self-funding and development was rapid. To save on transport costs the company built smelters on site. Smelting commenced in May 1886 and in the first year 28,800 tons were treated to produce bullion containing 1.707 million ounces of silver and 4,827 tons of lead. In September 1887 the smelting plant consisted of five 30-ton furnaces, but three 80-ton furnaces capable of processing 10,000 tons per month soon replaced these.⁶² Limestone flux was sourced from new quarries at Torawangee. By the end of 1887 the BHP Co. was at the centre of a Melbourne-based stock market boom in silver mining shares.⁶³

The comment has been made that if the 'Syndicate of Seven' had been more confident and better funded when they pegged the Broken Hill mineral leases in September 1883, they could have instead taken out the freehold title for a relatively small additional cost.⁶⁴ However, given the uncertainty of title for mineral conditional purchase claims and the ensuing delays from litigation (cf. *Garot vs Smith*), they probably took the only sensible option at the time, irrespective of their level of confidence. Ironically for the New South Wales Government, the declaration of the Albert Goldfield on the 25th of February 1881 with inclusion of the Barrier Ranges,

bureaucratic oversight on title validity, combined with any lack of confidence or funds on the part of the ‘Syndicate of Seven’, effectively meant that the Broken Hill Proprietary Company did not gain freehold title to the immense mineral wealth of Broken Hill. The company was obliged to pay royalties to the New South Wales Government at whatever rate the government decided, and over the life of the mine this would amount to millions of pounds.

The Thackaringa pioneers

It is illuminating to briefly examine the backgrounds and histories of the men who discovered and developed the early Thackaringa mines. Although clearly interested in mining opportunities and perhaps with some prospecting experience, none of them had a strong mining background. Rather, they were pioneer bushmen and frontier entrepreneurs with an eye to any opportunity that might generate some wealth. Their interest in minerals was probably not unusual, as although the main focus in the region at this time was pastoral, particularly wool production, many of the early settlers and businessmen were aware of the potential for mineral discoveries, particularly following the gold rushes and other metal discoveries in the newly developing frontier areas, such as the copper of Cobar found in 1870.

Development of the Barrier Ranges silver mines, including Broken Hill, followed a pattern common on Australian mining fields in the nineteenth century. Initial discovery and testing by prospectors was followed by small-scale mining through partnerships and syndicates involving the local frontier entrepreneurs who had some capital and initiative to develop the mines. Syndicates commonly formed a stepping-stone to companies, which could then attract more investors to provide the capital necessary to develop the larger and more complex deposits (for example see Figs 2-4).

1) Julius Nickel

Julius Charles (Carl) Nickel, also commonly known as Charlie Nicholls, was from Tilsit in East Prussia and born about 1843.⁶⁵ He may have come to Australia as a seaman, as there is a record of a seaman named Julius Nickel being charged with ‘insulting behaviour’ in Hindley Street Adelaide in January 1875, and fined 10s.⁶⁶ Little is known of his early life or the exact date of his arrival in Australia. Certainly he was in Australia before the end of 1875, when he was working as a contract well and tank sinker with Dan McLean on Thackaringa Station. At this stage he was also known to be interested in prospecting, particularly for gold, and may have had some previous experience in this.⁶⁷ He and Dan had to guarantee that they would complete their contract before rushing off on any prospecting expeditions, but he was still alert to potential prospects in the country they were working in during the contract, and this led to his discovery of galena near Thackaringa.

It could be considered that Nickel was cheated out of his discovery by Stokie after he had declined to join with Stokie before travelling to Adelaide in May 1876. It was later claimed that Stokie asked Nickel if he had pegged the ground and when he replied no, Stokie warned him that he would locate the site, which he did during Nickel’s absence.⁶⁸ Despite losing this discovery Nickel continued prospecting and

went on to make other discoveries and peg many valuable claims in the Barrier Ranges. These included the Maybell and adjacent Maybell North deposits mentioned above. Nickel retained shares in both these mines when they were floated and he became the manager of the Maybell North mine. By this time the 'big German', as he was commonly referred to, was recognised as an intelligent and successful prospector.

Being of German background, Nickel would probably have been acquainted with other Germans in the area at the time, including 'German Charlie' (Charles Carl), Charles Rasp and Otto Fischer. In December 1883, with James Anderson and Otto Fischer, Nickel pegged Block 17 on the Broken Hill line of lode, which was named the Cosmopolitan, after persons from a plethora of national backgrounds became shareholders.⁶⁹ Following discovery of silver chlorides on the BHP leases, two shafts were sunk on Block 17, but no payable ore was found. The mine was sold to the North Broken Hill Silver Mining Company in 1885, eventually to become part of the large North Broken Hill mine.⁷⁰ Nickel was also linked to discoveries and claims at One Tree Hill and Round Hill.⁷¹ By early 1886 Nickel was drawing an income of £5,000 per annum from his various mining interests and in June of that year he engaged Thomas Low of Silverton as his attorney to manage his affairs.⁷² At the fourth annual general meeting of the Maybell North Mining Company in October 1887, Nickel was appointed local director of the company.⁷³

Julius Nickel died in Adelaide on the 5th March 1894 aged 51.⁷⁴ He does not appear to have had any immediate family, at least at the time of his death. His estate, valued at £1,600 was vested in trust to Justice Robert Homburg and another trustee, both of whom died before the estate could be settled. The trust properties of Homburg were bequeathed to the Hon. Hermann Homburg (Attorney General for South Australia), and Robert Homburg (M.P.) Ultimately the estate became the focus of a complicated court case related to the Trading with the Enemy Act 1914-21, and a claim by two German nationals, Klara Schmidt and Arthur Richard Nickel, presumably relations of Nickel. This was finally resolved in July 1928.⁷⁵

2) John Stokie

John Stokie (Fig. 5) was born at Geelong, Victoria, in 1842, apparently out of wedlock, to Thomas Stokie, a 'ticket of leave' convict, and Mary Gorman. He became a drover and stockman, working throughout Victoria and New South Wales. In September 1867 he married Winifred Curran at Wentworth on the Darling River, in southwest New South Wales. The following year the couple moved to Menindee, where the first of their seven children was born a few months later. In Menindee, Stokie became close friends with Patrick Green and the two men frequently discussed the possibility of making their fortunes out of minerals.⁷⁶ He continued working as a drover and at odd jobs until 1870 when he moved to Tolarno Station south of Menindee, where he was given a job as storekeeper. In 1872 Stokie and his family moved to Poolamacca Station in the Barrier Ranges. Here he worked as overseer and at one point helped Sidney Kidman, later to become a famous 'cattle king', obtain a job, droving for the owners.⁷⁷ While at Poolamacca, Stokie met and became friends with 'German Charlie' who operated a shanty on Campbells Creek. Stokie successfully applied for a liquor licence, possibly

the first issued in the Barrier Ranges, and in 1874 moved to Thackaringa Station. Here he observed the great traffic of teamsters and decided to build a hotel, which he called the Border Inn, generally known as the old Thackaringa Hotel. He was the licensee of this establishment from 1874 to 1877 and became active in prospecting.⁷⁸

After his initial venture with Patrick Green at the Pioneer Mine near Thackaringa, Stokie took up a selection at Umberumberka and in early 1879 constructed a dwelling and store.⁷⁹ It was during this time that he discovered the nearby

Figure 5: *John Stokie.*



Source: R.H.B. Kearns, *Silverton: A Brief History*, 1992 and courtesy Stokie Family photo

Umberumberka silver-lead deposit, which he subsequently pegged with Edward Pegler and which was floated as the Umberumberka Silver Lead Mining Company in October 1882. In 1883 he extended his store to include a hotel and the following year he became Chairman of the Barrier Ranges Progress Committee.⁸⁰ In the same year he had a severe illness, which affected his memory. He continued to live and work in the Silverton area until 1891 when he was listed in the Silverton Directory as ‘J.H.S. Stokie landed proprietor off Bourke Street’.⁸¹ About this time his wife died and he moved to Broken Hill where he lived for the rest of his life. Stokie died there in December 1927 aged 84 years, after sustaining a broken leg the previous June from which he never fully

recovered. He was buried in Silverton, a town that he essentially founded through his discovery of the Umberumberka mine.⁸²

3) Patrick (Paddy) Green and Richard (Dick) Green

Patrick Green (Fig. 6) and his younger brother Richard were both early pioneers of the Darling River region in western New South Wales. Patrick was working in the area by 1858, when he married Eliza Fairchild in January of that year at Trinity Church in Adelaide.⁸³ They returned to the Darling and settled at the river town of Menindee, where Patrick purchased a store from Edward Wicker and set up business.⁸⁴ Patrick had previously met Joseph Becker and Alexander Ross and they formed the trading company of Alexander Ross and Co. in 1861. Becker managed a branch store in Bourke and Green the branch in Menindee. Patrick became involved in a number of business activities and developed connections along the Darling River and to South Australia, where he procured items for his store via Terowie, with the aid of William Maiden’s teams when the river was too low for transport. In 1872 he is listed as operating as a butcher, probably as part of his store and he and his wife also managed the Menindee post office at various times, also from the store.

Patrick Green had some involvement and interests in early copper mining in the Darling region. In November 1871 when he was the registered owner of the paddle steamer *Princess Royal*, he was approached by his business partner, Joseph Becker, to select a suitable mine manager for the recently discovered Cobar copper mine. He recommended Thomas Lean, who travelled with a group of Cornish miners as far as Menindee on the *Princess Royal*, before continuing to Cobar by coach due to the low

Figure 6: Patrick Green.



Source: Broken Hill Library Archives.

level of the Darling River.⁸⁵ Later in July 1872 when the Cobar Copper Mining Company was set up, Green invested in the company in the name of his wife, with 100 £1 shares.⁸⁶ This may have sparked an interest in copper, as he was subsequently involved in copper prospecting in the Barrier Ranges, including at the Alpha mine, and the Yellowstone prospect, just north of the Mount Gipps Hotel. At the latter prospect, owned by S. Brown and R.B. Pell, he sank a 15m shaft in search of copper in about 1874, apparently with little success.⁸⁷ His interest in mining prospects and his friendship with John Stokie, led to his involvement in the initial Pioneer silver-lead mine at Thackaringa in 1876. Later in 1876, with his wife, he purchased an allotment in Wilcannia and may have been planning to move there.⁸⁸

Patrick Green died at Glenelg in South Australia on 12 August 1877, shortly after transferring to this seaside resort to improve his health.⁸⁹ He was aged 47 and left a large family of eight children. Before his death he had optimistically predicted that the Barrier Ranges would become an important mining district, but in his will he made no provision for transfer of his Thackaringa mining leases, which were consequently forfeited.⁹⁰ His widow Eliza married Edwin Hosking in July 1880 and the couple had a son Frank, in May 1881. Eliza died in February 1913.⁹¹

Richard Green (Fig. 7) came to the Darling River from the Bathurst area in about 1869.⁹² In 1863 he had married Sarah Parker from near Bathurst and the couple were to have ten children.⁹³ In 1870 he was operating a hotel in Wilcannia and then moved to Menindee where he was a hotelkeeper from 1871 to 1873.⁹⁴ In 1875 he settled with his wife and family in Bourke and initially set up as a cattle dealer and butcher.⁹⁵ In February 1879 he was elected an alderman of the recently proclaimed Municipal District of Bourke, and in 1880 he became Mayor of Bourke, serving three successive terms until 1882.⁹⁶

Figure 7: *Richard Green*



Source: Bourke Library Archives.

In 1876 and 1880 Richard was involved in copper prospects around Cobar, with interests in two mineral conditional purchase claims (M.C.P. 76-25 and 80-45), including with Thomas Hartman, one of the discoverers of Cobar, and P. Murray.⁹⁷ In early 1881 he re-pegged the Thackaringa claims over the Pioneer mine, originally taken out by his brother Patrick.⁹⁸ Here he commenced developing the mine and shipping the ore to England. Mining at the Pioneer continued intermittently until about 1885, when there was a hiatus, probably due to depletion of the higher-grade near-surface ore. After owning the mine for six years, Richard sold his interest to a consortium headed by William Jamieson, reportedly for £10,000, and it was floated into the Pioneer Silver and Lead Mining Company.⁹⁹

In 1887 Green returned to the hotel business, first as licensee of the Exchange Hotel in Bourke and in 1888-1889 licensee of the Royal Hotel.¹⁰⁰ He left Bourke in 1889 and moved to Sydney to become the licensee of the Grand Hotel, in Wynyard Square. This venture was a financial disaster and in 1893 he returned to Bourke and took over the Salmonford Hotel at Fords Bridge, north of Bourke, until 1896.¹⁰¹ This venture was also financially unsuccessful, so he retired and moved in with his eldest daughter and husband, Malcolm Robertson, at Jandra station 60 km northwest of Bourke.

Richard Green died from heart disease on the 24th November 1900 after a short illness while visiting one of his daughters at Kirribree station near Bourke, and was buried on the property. In his obituary in the *Western Herald* he was described as one of the ‘sturdy pioneers who created Bourke’, a very generous, but retiring man often taken advantage of by many because of his kindness.¹⁰²

4) Aimé Garot

Aimé Louis Garot was born at Villiers, near Neuchatel in Switzerland in 1823. As a youth he trained as a watchmaker at the large watch-making factory at Fontainemelon and then travelled widely throughout Switzerland plying his trade. He was conscripted into the Swiss Federal Army as a carabineer, attaining the rank of sergeant and serving in campaigns against Lucerne and the Sonderbund. In 1848 under General De Feur, he was in the party of observers on the Rhine against the Prussians.¹⁰³ He married Sophia Bollinger at La Chaux-de-Fonds in June 1851, and in 1856 he emigrated with his wife and 3-year old son, Louis Godefroi, to Australia.¹⁰⁴ They arrived in Melbourne and went to Forest Creek on the Mount Alexander goldfield, where Garot may have initially tried his luck on the diggings. In 1858 he was listed as a shareholder in the Forest Creek Gold Mining and Washing Company.¹⁰⁵ A daughter, Emma Louise was born at Aberdeen Hill, Forest Creek in 1861, but died a year later.¹⁰⁶ The family moved into nearby Castlemaine where Garot set up as a watchmaker and jeweller in Mostyn

Street.¹⁰⁷ In 1865 a second daughter, Louise Adele (generally known as Adele) was born. The family was active in the local community and Garot became treasurer of the Mount Alexander lodge of the Grand United Order of Oddfellows.¹⁰⁸

After 15 years in Victoria, Garot was listed as insolvent and in 1873 he moved to Bourke on the Darling River in New South Wales.¹⁰⁹ At this time Bourke was a booming frontier town and he established a watchmaker and jewellery business in Mitchell Street. In 1878 Garot transferred to Wilcannia to expand the business, leaving his son Louis to run the branch in Bourke. Wilcannia was still a small but growing Darling River town, destined to become the third busiest port in Australia by the late 1880's, due to growing wool exports and the town's role in supplying goods to the expanding western district of New South Wales.¹¹⁰ Garot opened a shop in Reid Street, operating as a watchmaker, jeweller, optician and tobacconist. The joint business in Wilcannia and Bourke also incorporated the Darling Armoury Depot, selling firearms and ammunition. He became an active member of the Wilcannia community, helping to form a lodge of the Freemasons and establish a branch of the Grand United Order of Oddfellows.¹¹¹ Garot was considered an excellent watchmaker and he also had a good understanding of time zones.¹¹² In March 1882 he was called as a witness in a case under the Licensing Act in which Wilcannia hotel owner T. O'Leary was charged by Constable Drumm with operating 35 minutes after the statutory closing time of 11 pm. This was according to the town clock, constructed by Garot, who was asked to confirm the accuracy of the timepiece. His evidence stated that his clock gave the exact Sydney time and at the time mentioned, the correct local time in Wilcannia would be about 11 or 11.05 pm. The bench dismissed the case and the constable was later dismissed for misconduct.¹¹³

It appears that Garot maintained an interest in minerals and mineral-related opportunities. In February 1881 when payable gold was discovered at Mount Browne to the north of Wilcannia, he purchased the first gold nuggets to display in his shop, for £50.¹¹⁴ At about this time the Pioneer silver-lead mine at Thackaringa was re-pegged by Richard Green, who Garot would have known from his time in Bourke. He decided, or was invited by Green, to take out an adjacent claim (M.C.P. 7) which became the Gipsy Girl mine. During the subsequent rush to the area he pegged two additional claims at Thackaringa (M.C.P. 20 and 23) and another with John Stokie at Umberumberka known as the Silver Peak mine.¹¹⁵ He also had two-third interests in M.C.P. claims 24 and 25.

The issue of claim jumping over the Gipsy Girl mine has been outlined above, and effectively meant that for some time Garot was not able to mine what was one of the best silver-lead mines at Thackaringa. This and his other investments in the Barrier Ranges silver prospects may have put pressure on his finances. In February 1883 there was a major fire in Mitchell Street, Bourke, and some of the stock in the business operated by his son Louis was seriously damaged.¹¹⁶ The following year in January there was another fire in the adjacent stores of Kirkpatrick and Company, which resulted in further losses.¹¹⁷ It is likely that these incidents added to the financial strain in the family. The Barrier Ranges Silver Mining Association had taken a two-third interest in the Gipsy Girl mine at some time in 1884, and in early 1886 it was formed into the Gipsy Girl Silver Mining Company Ltd.¹¹⁸ However, by the end of 1885 Garot

was in major financial difficulty and in April 1886 he was listed as insolvent for the second time in his life, with liabilities of £10,602 and assets of £5,961.¹¹⁹ The bankruptcy case was concluded in November 1887, when he was forced to sell his interest of ten thousand shares in the Gipsy Girl Silver Mining Company, as well as his other mineral claims.¹²⁰ Despite these difficulties and at the age of 64, Garot attempted to make a new start, but how successful he was is not known.¹²¹

Aimé Garot died on the 16th April 1903 in the home of his daughter, Adele, at the Commercial Hotel in Wilcannia.¹²² Prior to his death he had suffered for many years from partial paralysis, possibly related to a stroke. Throughout his life he was widely considered a generous, community spirited and persevering man with a genial disposition.¹²³

Conclusion

The discovery of silver-lead ore at Thackaringa gave the first indication of a silver field in the remote Barrier Ranges of western New South Wales. Prospectors attracted to the area made further discoveries of small, silver-rich deposits of a type exploitable by individual prospector-miners and small syndicates of frontier entrepreneurs. Initial mining involved shallow excavation of the supergene-enriched silver ores using simple equipment and technology, including hand tools, windlass or horse whip for shaft sinking, and visual handpicking of the ore before packing in bags to transport elsewhere for smelting. The ore grade was high enough to make a profit without the trouble and expense of setting up smelters on site. In any case there was insufficient water and fuel available for successful smelting.

It seems surprising that the ore was shipped all the way to Europe via Adelaide, but at the time there was no capability to smelt silver-lead ore locally in South Australia and the best smelter technology was in Europe. A silver-lead smelter had been built and successfully operated on a small scale at Glen Osmond near Adelaide from November 1849 to 1851, but it was abandoned by the 1880s.¹²⁴ The English and Australian Copper Company had a copper smelter at Port Adelaide, but this was not set up for silver smelting until 1887 when it was modified to treat parcels of ore from the Barrier Ranges.¹²⁵ Furthermore, the cost of shipping ore to Europe as ballast was relatively cheap and little more than that for transport from the mines to Adelaide. The latter was facilitated by the silver-lead ores providing an additional back-loading cargo for the teamsters, but there were problems during the shearing season when bags of ore had to compete with the wool clip.¹²⁶

As company interest developed in the silver field it became clear that for large-scale mining, particularly of lower grade ores, local smelting would be required. The Barrier Ranges Silver Mining Association built the first smelter in early 1885, which treated ore from the Day Dream and other mines in the area, including for a time the Broken Hill Proprietary mine. Coke was imported from Adelaide at great expense and operations suffered due to lack of a good water supply. Another smelter was built at the Pinnacles Mine later in 1885, but only operated briefly and was eventually abandoned due to lack of water, limited ore, difficulty in obtaining flux and technical problems.¹²⁷

With development of the giant Broken Hill lode it became imperative for the Broken Hill Proprietary Company to build its own smelters and reduce transport costs. The first two smelters were built at the mine and smelting commenced in May 1886. The plant was rapidly upgraded and by 1888 could process 10,000 tons per month.¹²⁸ By now the railway connection to Adelaide had significantly lowered the cost of coke, but eventually the company would shift its smelting operations to Port Pirie, where it could rail silver-lead concentrates produced at the mine, cheaply import coke from the New South Wales coal fields and source ironstone for fluxing from Iron Knob in the nearby Middleback Ranges. These operational changes would ultimately lead BHP on a path of vertical and horizontal integration that would lay the industrial foundations of modern Australia.¹²⁹

The early discoveries at Thackaringa and Umberumberka were the spark that brought many prospectors to the Barrier Ranges, resulting in rapid and thorough exploration of the region. Most of the surface deposits were found over the period 1881-1885. These early discoveries and evidence that mines could be operated profitably in this remote region probably gave encouragement to Charles Rasp when he decided to re-examine and peg the 'broken hill' in September 1883. He could now see a clear opportunity and it was up to the 'Syndicate of Seven', organised by Rasp and McCulloch, to test and develop this perplexing find. The outcropping Broken Hill orebody was so large that its discovery was inevitable at some stage. However, it was the discovery of the Thackaringa galena veins that brought the mining interest and activity to facilitate development of the world's largest known silver-lead-zinc deposit, earlier than might otherwise have been the case.

Acknowledgements: The author thanks the National Library of Australia and the Geological Survey of New South Wales for access to information, particularly through their online services (including 'Trove' and 'Digs'). Thanks also to the archives section of the Broken Hill Library, the Bourke Library and the State Library of South Australia for provision of information and some photographs. Jane Morrison assisted in locating information about Aimé Garot and John Martin located the image of Richard Green. Helpful comments of two anonymous reviewers are also gratefully acknowledged.

Glossary: Blow – term used by prospectors to describe a prominent mass or block of mineralisation.
Horn silver – colloquial name for cerargyrite or silver chloride, based on its common waxy appearance. Cerargyrite typically has a grey or greyish green colour and when pure contains up to 75% silver. It was found in secondary oxidised ores associated with native silver in vugs in the rich vein-type deposits in the Barrier Ranges.

Mullock – waste rock.

Supergene – formed by descending waters during surface weathering.

Whip – an angled pole over a shaft with pulley and rope attached at the top end, by which a horse can be used to pull a bucket up the shaft to the surface. The next step up in mining technology from a hand windlass.

Units: 1 inch = 25.4 mm, 1 foot = 0.3048 m, 1 mile = 1.609 km, 1 acre = 0.4047 hectares.

1 troy oz (the standard measure of gold and silver) = 20 dwt = 31.10348 g; 1 dwt = 1.555 g.

1 pound (lb) = 0.454 kg, 1 ton (long) = 2,240 pounds (lbs) = 1.01604 tonnes.

1 (imperial) gallon = 4.4561 litres.

Pre-decimal currency

£1 (pound) = 20s (shillings) and 1 shilling = 12d (pence)

Endnotes

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- ² Geoffrey Blainey, ‘History’, in H.K. Worner and R.W. Mitchell (eds), *Minerals of Broken Hill*, Australian Mining and Smelting Ltd, Melbourne, 1982, pp. 12-21.
- ³ Blainey, *The Rise of Broken Hill*; Geoffrey Blainey, *The Rush that Never Ended*, 2nd ed., Melbourne University Press, Carlton, 1969, 389 pp.; R.J. Solomon, *The Richest Lode*, Hale and Iremonger, Sydney, 1988, p. 115; R.H.B. Kearns, *Broken Hill 1883-1893*, Broken Hill Historical Society, Broken Hill, 1996, p. 12.
- ⁴ ‘Heads of Intelligence’, *The South Australian Advertiser*, 29 March 1867, p. 2.
- ⁵ Ken McQueen, ‘A thirsty and confusing diggings: The Albert Goldfield, Milparinka-Tibooburra, north-western NSW’, *Journal of Australasian Mining History*, vol. 5, 2007, pp. 67-96.
- ⁶ There are numerous, in some cases fanciful, accounts of the discovery of silver-lead ore at Thackaringa, which vary significantly in detail. To establish the most accurate sequence of events I have used official sources and accounts from close to the time of discovery by persons who were involved in the events or knew first hand the various players, including the son of John Stokie. These accounts are largely consistent. ‘The Miner – The Barrier Ranges’, *Australian Town and Country Journal*, 13 February 1886, p. 24; ‘West Darling Pioneer – Mr W. Maiden Reminiscent’, *The Adelaide Register*, 21 January 1924, p. 10; ‘Our Early History – Corrections by Mr Orman’, *Barrier Miner*, 13 September 1933, p. 2; ‘Comments of Readers – Discovery of Pioneer Mine’, *ibid.*, 24 July 1953, p. 11; R.H.B. Kearns, *Silverton: A Brief History*, Broken Hill Historical Society, Broken Hill, 1992, pp. 6-8. Contrary to common assumption, Nickel did not accidentally make his find while he and McLean were sinking a well, but rather during his prospecting around the site. ‘Mr John Stokie’, see *Adelaide Chronicle*, 31 December 1927, p. 58. ‘Thackaringa’ is probably an aboriginal name from the local Paakatanyi language, but its meaning appears to be unknown. The old timers pronounced the name as ‘Tackaringa’, possibly the Irish pronunciation. Jeanette Hope, *Unincorporated Area of NSW Heritage Study*, River Junction Research, 2006, p. 144, www.outbacknsw.com.au
- ⁷ Description of mining leases registered under the Mining Act of 1874, Geological Survey of NSW, Open File Report, GS1970/520.
- ⁸ ‘The Miner – The Barrier Ranges’ *Australian Town and Country Journal*, 13 February 1886, p. 24.
- ⁹ *Ibid.*; ‘Thackaringa’, *ibid.*, 12 November 1881, p. 24; ‘West Darling Pioneer – Mr W. Maiden Reminiscent’, *The Adelaide Register*, 21 January 1924, p. 10.
- ¹⁰ J.C.F. Johnson, *To Mount Browne and Back or Moses and Me*, Advertiser Print, Adelaide 1881,
- ¹¹ *Ibid.*, p. 9. Greener was a famous make of shotgun at the time, featuring a choke boring that gave high accuracy, longer range and a close shot pattern.
- ¹² Kearns, *Silverton: A Brief History*, p. 8.
- ¹³ ‘The Miner – The Barrier Ranges’ *Australian Town and Country Journal*, 13 February 1886, p. 24; ‘The Thackaringa Silver Lead Country’, *South Australian Advertiser*, 25 April 1883, p. 7.
- ¹⁴ ‘The Miner - The Silver Bearing Lodes of the Barrier Ranges’, *Australian Town and Country Journal*, 27 September 1884, p. 24.
- ¹⁵ Annual Report of the New South Wales Department of Mines (hereafter *ARNSWDM*) for 1883, p. 133.
- ¹⁶ ‘Mining – The Barrier Silver Mines’, *South Australian Register*, 24 September 1883, p. 6.
- ¹⁷ ‘A Trip to Silverton, New South Wales, No. III’, *ibid.*, 10 June 1884, p. 6.
- ¹⁸ ‘Mining – The Barrier Silver Mines’, *ibid.*, 24 September 1883, p. 6.
- ¹⁹ ‘The Miner - The Silver Bearing Lodes of the Barrier Ranges’, *Australian Town and Country Journal*, 27 September 1884, p. 24.
- ²⁰ *ARNSWDM* for 1888, p. 38; *ibid.*, for 1890, pp. 39, 125; *The Age*, 30 November 1888, p. 7; *ibid.*, 1 December 1891, p. 6.
- ²¹ H.F. King, The Thackaringa Mines, in A.B. Edwards (ed.), *Geology of Australian Ore Deposits*, Australasian Institute of Mining and Metallurgy, Melbourne, 1953, pp. 685-686.
- ²² NSW Department of Mineral Resources, *Mining and Exploration at Broken Hill: A Review*, Department of Mineral Resources New South Wales, Sydney, 1981, p. 27.
- ²³ ‘Advertisement’, *Wilcannia Times*, 22 March 1879.
- ²⁴ ‘The Silver Mines at the Barrier Ranges’, *Australian Town and Country Journal*, 23 September 1882, p. 23.
- ²⁵ *Ibid.*; ‘Prospectus of the Umberumberka Silver Lead Mining Company Limited’, *South Australian Register*, 11 October 1882, p. 4.
- ²⁶ ‘The Silver Mines of New South Wales’, *Sydney Morning Herald*, 3 March 1886, p. 7.
- ²⁷ Kearns, *Silverton: A Brief History*, p. 10.
- ²⁸ ‘The Barrier Ranges Silver Mines – Silverton’, *The Australasian*, 21 November 1885, pp. 1-2.

- ²⁹ ‘A Trip to Silverton, New South Wales – No. II’, *South Australian Register*, 7 June 1884, p. 5; ‘The Silver Mines of New South Wales’, *Sydney Morning Herald*, 16 March 1886, p. 5; Kearns, *Silverton: A Brief History*, p. 14. The ‘slugs’ were composed of heavy silver chloride or horn silver and were searched for by the prospectors in the red soil as they could be followed back to their source in a similar way to following up gold nuggets to find reef gold deposits. See Norman Taylor, Report on the Silver Mines in the Barrier Ranges, New South Wales, in Geological Survey of New South Wales, Mineral Report MR 3226.
- ³⁰ ‘A trip to Silverton, New South Wales – No. II’, *South Australian Register*, 7 June 1884, p. 5.
- ³¹ ‘The Barrier Silver Mine’, *The Australasian*, 31 May 1884, p. 31; ‘The Silver Mines in the Barrier Ranges’, *Bendigo Advertiser*, 2 July 1884, pp. 1-2.
- ³² ‘About the Silver Mines’, *Burra Record*, 21 August 1884, p. 2.
- ³³ ‘Mining – The Barrier Silver Mines’, *South Australian Register*, 24 September 1883, p. 6.
- ³⁴ ‘The Barrier Ranges Silver Field’, *South Australian Register*, 21 August 1884, pp. 5-6.
- ³⁵ ‘Smelting Works’, *Barrier Ranges Silver Mines, New South Wales*, Geological Survey of New South Wales, Report MR3226, p. 34.
- ³⁶ K.J. Dickinson, ‘Mining history of the silver, lead, zinc and copper mines of the Broken Hill district to 1939, excluding the main line of lode’, *Geological Survey of New South Wales, Bulletin No.21*, 1939, p. 85.
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- ³⁸ ‘A Trip to Silverton, New South Wales – No II’, *South Australian Register*, 7 June 1884, p. 5,
- ³⁹ ‘The Silver Mines in the Barrier Ranges’, *Bendigo Advertiser*, 2 July 1884, pp. 1-2.
- ⁴⁰ Dickinson, ‘Mining history of the silver, lead, zinc and copper mines of the Broken Hill district’, p. 45.
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- ⁴⁶ The Albert Goldfield was proclaimed on the 25th February 1881 and covered the whole Albert District of far western New South Wales, including the Barrier Ranges. See ‘Extract from Government Gazette’ *Wilcannia Times*, 10 March 1881; ‘The Barrier Ranges Silver Mines’, *The Australasian*, 21 November 1885, pp. 1-2.
- ⁴⁷ *Ibid.*; ‘Mineral Conditional Purchases – When Illegal’, *Freeman’s Journal*, 13 June 1885, pp. 13-14.
- ⁴⁸ J.B. Jaquet, ‘Memoirs of the Geological Survey of New South Wales’, *Geology of the Broken Hill Lode and Barrier Ranges Mineral Field*, *Geology No. 5*, Department of Mines and Agriculture, Govt. Printer, Sydney, 1894, p. 6.
- ⁴⁹ ‘Silver mining at Thackaringa’, *South Australian Register*, 30 April 1883, p. 5; *Sydney Morning Herald*, 30 April 1883, p. 5. Interestingly the injunction was granted in the name of Adele Louise Garot, Aimé’s 18-year old daughter, who appears to have been acting on behalf of her father.
- ⁵⁰ ‘Mining – The Barrier Silver Mines’, *South Australian Register*, 24 September 1883, p. 6.
- ⁵¹ ‘Silverton’, *South Australian Register*, 1 April 1884, p. 5; ‘Silverton’, *ibid.*, 28 October 1884, p. 6.
- ⁵² ‘Mineral Conditional Purchases – When Illegal’, *Freeman’s Journal*, 13 June 1885, pp. 13-14.
- ⁵³ *Ibid.*; ‘The Barrier Ranges Silver Mines’, *The Australasian*, 21 November 1885, pp. 1-2.
- ⁵⁴ http://www.austlii.edu.au/au/legis/nsw/num_act/cltarvao1886n26525.pdf; This was not the last title issue to beset Broken Hill. In November 1885 a ruling was made to exempt the area around the recently pegged ‘broken hill’ from occupation by residence or business areas. Despite this exemption and for practical reasons, by 1887, 4,000 people had settled on these lands. Almost the entire population of the new town of Broken Hill were trespassers. The exemption was removed on the 23rd of September 1887, giving residents some certainty over the tenure of their properties and resulting in a marked improvement in the quality of architecture, *ARNSWDM* for 1886, p. 101; *ibid.*, p. 104; Jaquet, *Geology of the Broken Hill Lode and Barrier Ranges*, pp. 12-13.
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- ⁶² ‘Mineral Resources of New South Wales – Report by C.S. Wilkinson, Government Geologist NSW’, *South Australian Weekly Chronicle*, 24 September 1887, p. 5.
- ⁶³ Blainey, *The Rise of Broken Hill*, pp. 24-29.
- ⁶⁴ Blainey, *The Rush that Never Ended*, p. 145.
- ⁶⁵ ‘Family Notices – Deaths’ *The Adelaide Advertiser*, 6th March 1894, p. 4. In historical records and newspaper articles Julius Nickel is referred to by a plethora of name variants and spellings including: Julius Nickel, Charles Nickel, Charles Nickyl, Charles Nickle, Charlie Nicol, Charles Nichols and Charlie Nicholls.
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- ⁶⁸ ‘Mr John Stokie’, *Adelaide Chronicle*, 31 December 1927, p. 58.
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- ⁹⁸ Wisheart and Co., Map of Silverton, 1885, and accompanying booklet.
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- ¹⁰³ ‘Mr A.L. Garot’, *Western Herald*, 24 December 1887, p. 3.
- ¹⁰⁴ ‘Shipping Intelligence’, *South Australian Register*, 24 January 1856, p. 2. A.L. Garot is recorded as arriving on the barque *Helene* on the 23rd January from Hamburg. His wife and son may have arrived later or the passenger list might not have shown then as separate listings. An M.T. Bollenger was also a passenger on the same ship.
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- ¹⁰⁶ Victoria Australia Birth Index, Certificate no. 21551.
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- ¹¹⁰ ‘Wilcannia’, *Australian Town and Country Journal*, 26 December 1874, p. 11; B. Swann, *Beyond the Darling*, Investigator Press, Adelaide, 1972, p. 6.
- ¹¹¹ ‘Death of Mr A.L. Garot’, *Western Grazier*, 18 April 1903, p. 2.
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- ¹¹³ ‘Novelty under the Licensing Act’, *Newcastle Morning Herald and Miners’ Advocate*, 15 March 1882, p. 2. Prior to 1895 each town in Australia was free to set its own local time called ‘local mean time’. This provided the technicality that allowed the publican to get off in this case as Garot’s clock was set to Sydney time.
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