Miners fill a stope in the Broken Hill Proprietary mine. The stope is the working area that gives access to the ore face. Using tailings and barren rock, the men are building up the floor area in order to work on the roof. The hardwood timber is gum and boxwood from the Darling River. The new manager, W.H. Patton, replaced this with the American square-set method after mid-1888. This rare early photograph was taken by J. Duncan Peirce with the aid of magnesium lights. The stope is therefore brighter than it would normally be when lit only by a few candles. Underground mining was a world apart, with its own rhythms and risks.

BHP ARCHIVES

CHAPTER 10

MINING

MINING PEOPLE belonged to another world. Not for them the natural rhythms of night and day, winter and summer, the growing of animals and crops, or the sounds of animals and birds and the long silences of the countryside. Mining people lived to rhythms and noises made by men and machinery. The mine whistle divided the day. In big mines, the underground men worked in eight-hour shifts, three a day, stopping only on Sunday. Most accidents occurred during the latter part of the midnight to 8 am shift, because men had not slept well during the day. The farmer's children saw their father several times a day; in some weeks the miner's children hardly saw their father. Stamp mills were stopped every two or three weeks. Gold amalgam was cleaned from the stamps and the yield for the crushing measured carefully. On its outcome depended dividends for shareholders and work for miners.

When Ann Williams and her husband stayed at the gold town of Araluen, on their way to take up a selection on the south coast of New South Wales, Ann thought 'it was so strange last night for whenever you woke you could hear engine whistles blowing and machinery at work for they work the claims night and day'. Mining people liked to hear the 'eternal music of the stamps'. At Ravenswood in north Queensland a stamp mill stood one hundred metres from the bedroom windows of the Railway Hotel. In nearby Charters Towers, Thomas Mills, the richest person in town, lived next to his Day Dawn foundry.

Mining concentrated people and created large inland cities such as Ballarat and Broken Hill. A mining town created a local market for timber and machinery, foodstuffs and other goods. Manufactures and trade developed in the town, and farming around it. It paid to build railways to inland mining cities, but not into thinly populated pastoral regions. Minerals were likely to be found in areas of recent geological disturbance, so that many mining fields followed the Great Dividing Range from Victoria to north Queensland, or in arid areas where winds had uncovered mineral bodies but water had not dissolved them. Mining pulled settlement away from the settled areas into forests and deserts, disturbing the spread of settlement from the coastal port cities.

Miner pan-washing. *Artists looked back with nostalgia at the independent bush worker and miner. This man is working alone in the bush, but most miners worked for large companies which had the required technology and capital. Watercolour by J.A. Turner, c1890.*
MITCHELL LIBRARY

In an age when life was full of risk, mining offered the prospect of huge prizes. Fortunes were won and lost by investors or by prospectors on the frontiers, spurred on by the hope that Etheridge or Yilgarn might be another Mount Morgan. But most miners were now wage earners; their gamble was with the mine closing down, with underground rock falls and explosions that killed and maimed, and with lung disease. Cautious miners who could afford it subscribed to unions and benefit societies to insure against injury or death.

A lucky few jumped from the working class to a life of wealth, but on most people mining imposed its own patterns of class relations. The patterns varied more than in pastoral and farming activities owing to the greater diversity of mining. Gold was a precious metal and so had the power to attract prospectors and settlement into difficult and isolated regions, such as north Queensland, the deserts of Western Australia and the forests of the west coast of Tasmania. The two extremes of mining communities were the gold cities of Ballarat, Sandhurst (now Bendigo) Gympie and Charters Towers, with settled class structures of workers and capitalists, and the frontier fields where life was rough and all were capitalists, if not for long. Company towns dependent on one mine formed a third type of mining community. The Newcastle coalmining district comprised a fourth type.

Gold was the most important mineral. It accounted for half of total mining output, and was the pioneer mineral that often led to the discovery of others. Silver–lead output was nearly all from Broken Hill, but there were hundreds of silver prospects across Australia. The main tin mines were at Mount Bischoff in Tasmania, in New England, and at Herberton in north Queensland. Copper at Wallaroo–Moonta gave South Australia its only important mining field, and New South Wales and Queensland also had large copper mines.

TECHNOLOGY

The mining frontiers of 1888 in north Queensland, Alice Springs and along the edge of the Western Australian desert from the Kimberleys down to Yilgarn, were difficult to work. Gold and other minerals were sparse, costs were high and life was harsh. Prospectors lived in hope, but the age of the great alluvial rushes was over.

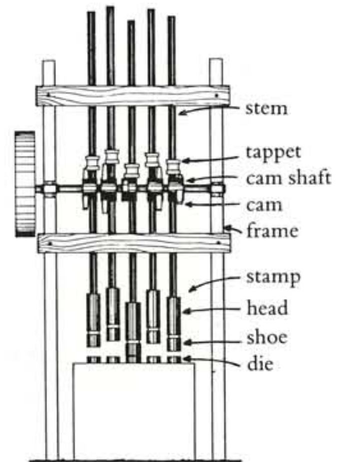
It was now the age of reef mining, which required complex technology, capital investment and a disciplined workforce. Goldmines at Sandhurst were down below 600 metres and at Charters Towers 300 metres. Steam engines drove stamp batteries, hauled cages up the shafts and drove ventilation pumps in the mines. In big mines, automatic rock drills eased the physical labour of hammer and tap, but sped up work. Discovery of deep ore bodies was now as important as discovery of new surface deposits. Sandhurst, Charters Towers and Gympie had all yielded rich deep reefs in the early 1880s. Discovery in depth was sometimes by chance, but more often by the sinking of exploratory shafts. A further difficulty occurred when mining went below the permanent water table, where the gold often remained in chemical association with other minerals from which separation was difficult.

In the stamp mill a steam engine drove a horizontal shaft that rotated cams fixed along its length. As the cam rotated it raised its stamp, then released it to fall by gravity onto the die, thus crushing the pieces of ore. The cam turned another half circle and raised the stamp for another drop. The weight of the stamp and its rate of drop varied according to the ores being crushed. Small batteries of five stamps were carted across deserts and into mountains. Twenty or thirty stamps comprised a large mill.

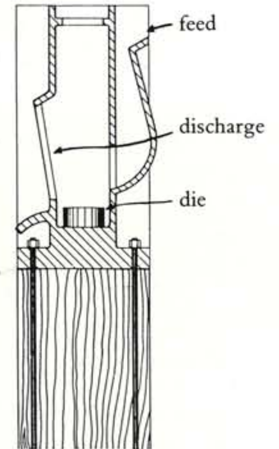
Pieces of ore were crushed until they were small enough to release the gold particles. The gold, which had a unique affinity for liquid mercury, was collected in two stages. Inside the mortar box, mercury globules floating in the splashing water collected pieces of gold, became heavy and sank into the crevasses around the dye. The bulk of the gold and the crushed rock bounced up to a discharge screen of fine steel netting and escaped through it into a sluice box down which the muddy ore mixture flowed. Periodically the stamp was stopped, and the gold–mercury collected from inside the stamp and from the sluice. The mixture was then treated to separate gold, mercury and waste matter.

The stamp was a cracking rather than a grinding machine, best suited to free-milling ores such as those at Ballarat and Sandhurst, which had big particles of free gold embedded in quartz. The New Chum consolidated mill at Sandhurst had heavy stamps which ran at 70 to 72 drops per minute and put through 2.2 tonnes of ore every 24 hours. T.A. Rickard, visiting American mining engineer, reported that Sandhurst milling was very inefficient, the result of conservatism, rule-of-thumb methods and insufficient pressure to improve milling practice. By the 1880s the rapid crushing and high extraction at Ballarat and Sandhurst was exceptional. Charters Towers mills achieved only 65 per cent extraction, owing to the fineness of the gold that floated away in the sluice box with the waste material.

Silver–lead, copper and lode tin mines required more expensive and complex methods of extraction. They had to process much greater quantities of ore to be profitable, and the minerals were often refractory. The Broken Hill silver–lead mines, although rich in minerals, had severe smelting and extraction problems from the start. The directors of the Broken Hill Proprietary Company brought from the USA, on high salaries, W.H. Patton as manager and Herman Schlapp as metallurgist. Together in 1888 they introduced modern American technology to Australian mining.



FIVE-STAMP BATTERY



MORTAR BOX

A five-stamp battery for crushing ore. Stamps were synchronised to fall in sequence, to use the engine power efficiently and to reduce vibrations. Each stamp was enclosed in a mortar box. Boys fed the ore into the box by hand, even in the largest mills. (Large American mills had automatic feeders.) The mill manager adjusted the height of the discharge screens and the mesh of the netting for fine or rough crushing. Batteries manufactured in the colonies stimulated the engineering trades.

SANDHURST

A traveller said of Sandhurst that it had 'a mine in every backyard'. There were actually 140 goldmines, most owned by limited liability companies. Rows of poppet heads ran north and south along the main lines of reef, the richest of which were the Hustlers, Garden Gully and New Chum lines. Standing beside the poppet heads, corrugated iron sheds housed the steam engines that drove cages in the shafts, powered compressed-air rock drills, and, in the large mines, drove crushing batteries. Sandhurst's 1151 stampheads were one-fifth of the Victorian total, but more than that in terms of ore crushed. The brick chimney stacks of the engine houses belched out 'widespreading banners of arsenical and sulphurous fumes'. Mullock heaps scarred even the residential areas, and in summer hot winds sent gritty quartz sand swirling into the homes of rich and poor.

Unused share certificate. The company was registered in Melbourne to exploit a claim at Drake in the New England mountains 200 kilometres north of Armidale. The preposterous nominal capital of £500 000 signifies the speculative nature of mining investment.
LA TROBE LIBRARY

The Great Red Rock Gold & Silver Mining Compy
New England
DRAKE, N.S.W
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This is to Certify that

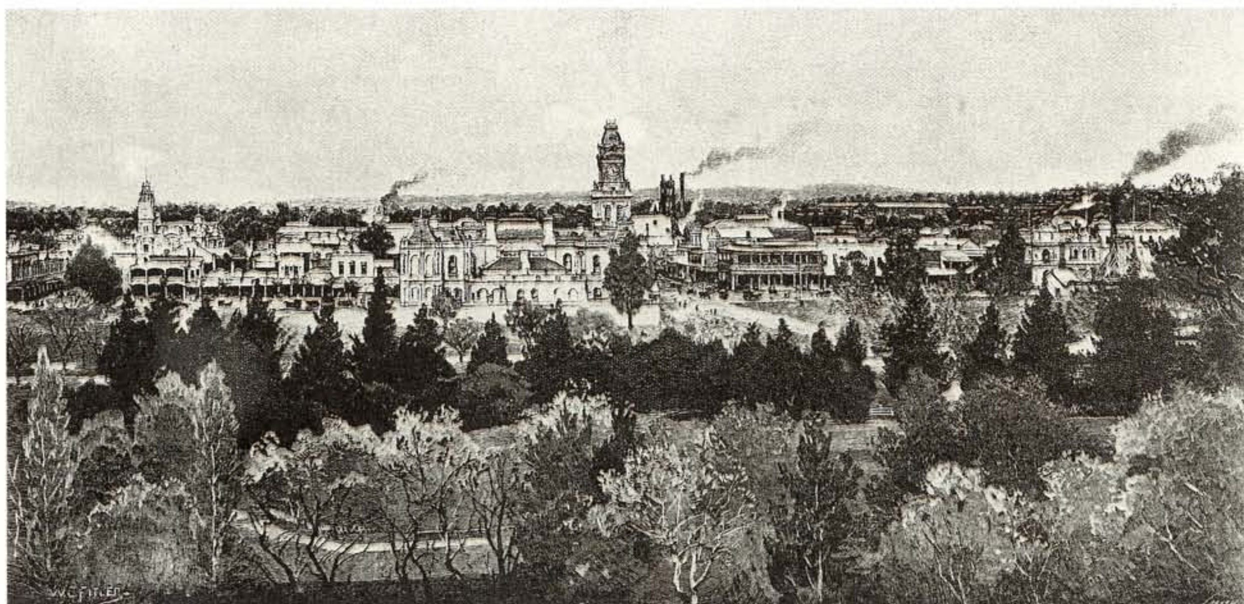
Sandhurst's mines were the deepest in Australia and among the deepest in the world. Seven shafts had been sunk below 600 metres and nine were below 450 metres. Deep mining required large capital investment. Sandhurst's mining directors called up £1.5m of shareholders' funds from 1870 to 1881, and a further £1.1m from 1881 to 1887. In 1888 they called up £172 055 and paid only £7644 above that in dividends. It was a poor year. Isaac Dyason, a mining investor, became 'morose and unkind' to his wife and children. His bank overdraft rose during the year but he kept up hope and vowed to 'get even' with his bank manager one day.

The important shareholders were no more than thirty men who had made their fortunes from gold and still had large investments. They included George Lansell, Ernest Mueller, the physician Dr Harry Leigh Atkinson, Robert and William Hunter and John Boyd Watson. Below them were local merchants and manufacturers who also held shares, usually worth only a few hundred pounds. Success in business depended largely on the prosperity of mining, and they were demonstrating their faith in it by modest investments. In the early 1880s perhaps 6 per cent of working miners also held shares; but with falling dividends and heavy calls in the late 1880s, the proportion declined to about 2 per cent, of whom many held less than fifty pounds.

George Lansell, who had arrived as a young English candlemaker in 1852, held half the mining capital in Sandhurst. He had returned recently from England at the request of the town's leading citizens, who hoped he would revive the fortunes of the mines. He started buying shares but this did not allay the fears of all investors. Isaac Dyason, who worked for Lansell, mistrusted him and worried throughout 1888 that Lansell would abandon mining and cause a general collapse in mining stocks. Lansell had immense influence in Sandhurst, but he never entered local or colonial politics. In good times shareholders demanded high dividends, so that in a bad year such as 1888 the mines were starved of development funds.

Absentee ownership was rare in Sandhurst. George Lansell owned a mansion in Melbourne but spent most of his time in the mansion erected amid the mullock of his 180 mine. Harry Atkinson and the Hunter brothers owned pastoral properties but maintained residences in Sandhurst. John Watson had all but retired from mining and was now one of Melbourne's largest landlords. Civic amenities were enhanced by the presence of this local elite who paid for the planting of trees and public gardens and the erection of public buildings. In the workplace, having owners on the spot rather than represented by managers might have been good for industrial relations. By contrast with Sandhurst and other large Victorian goldfields, the mining magnates of Broken Hill seldom even visited the city.

Sandhurst was a mature city with a diverse economy. Four out of ten men were employed in commerce, manufacturing, government and the professions. Most



Sandhurst, looking across the botanical gardens from the state school. The city of over 30 000 people had come a long way since it became known as Bendigo. Extensive civic improvements had been undertaken to cover the scars of mining. Hundreds of European and native trees were planted in the city streets and public gardens. The Victorian government provided a fine post office with clock tower (centre horizon) and the main banks erected imposing buildings. The town hall, also with a tower, designed by the German architect W.H. Vahland, is on the left. To the right of the post office can be seen the bell tower of St Paul's Church of England. Such civic pride did not prevent mining in the centre of the city; the City of Sandhurst mine can be seen smoking on the right. The grandeur of public buildings contrasted with the humble weatherboard and mud brick houses of the miners. A. Garran (ed), Picturesque atlas of Australasia, *Sydney 1886–88.*

manufacturing concerns were the normal run for a city of its size, but deep quartz mining required heavy machinery for drilling, lifting and crushing, and there were four large iron foundries; Abraham Roberts' employed seventy hands and Joel Horwood's sixty. The foundries also supplied machinery to Broken Hill and other new fields and made agricultural machinery for wheat farmers. Other large industrial concerns included a carriage works, two flour mills and six breweries. Like Ballarat, Sandhurst was also an administrative and legal centre for the Victorian government and a centre for several religious denominations. The city had a small surplus of women, as young men had left for other fields. Broken Hill had two men for each woman, and the Etheridge goldfield in north Queensland had fourteen men for each woman.

Goldmining in Victoria and copper mining at Moonta and Wallaroo in South Australia lured immigrants from Cornwall's copper and tin mining districts. The Cornish, or Cousin Jacks as they were called, provided mining skills, and the language of Cornwall's mines was common usage in Australian mines. Sandhurst, Ballarat and Wallaroo were strongholds of Methodism and temperance. The Cornish were strong in Broken Hill but not in the Newcastle coalmining district, which recruited immigrants from the English coalfields.

The 3000 men employed in the mines at Sandhurst included battery-hands, engine drivers, carpenters, blacksmiths and draymen as well as miners. In charge of each mine was a manager, whose duty was to see that safety regulations were obeyed. These regulations were far stricter in Victoria, where goldfields politicians had wielded considerable political power for several decades, than in the other colonies. Most Sandhurst managers had started as working miners and had little formal education or metallurgical training. They earned £3 to £7 a week; some indulged in share speculation and achieved moderate wealth. In lean years such as 1888 dividends were scarce and jobs insecure, for an owner might well remove a manager whom he judged unsuccessful.

Young men, first employed underground at the age of eighteen, began by shovelling mullock into trucks for 10s to 25s a week. In the 1880s, after a visit to the United States, George Lansell introduced compressed-air rock drills. Two men were employed on each drill, and like all underground men they worked eight

hours (including crib or lunch time) a day for six days at the rate of 7s 6d per day. Miners working in shafts also received 7s 6d. The air in deep mines was often humid, and although machine drills eased the physical labour of hand drilling, they were noisy and produced lethal quartz dust. Engine drivers were paid 5s more than miners, while labourers in crushing batteries on the surface earned 6s 8d per day. Miners considered themselves superior to battery-labourers: when Isaac Dyason's brothers-in-law were unemployed, they rejected offers of jobs on the surface as demeaning. Other mining communities had similar differences in remuneration. In Broken Hill, miners and engine drivers received 10s a day, labourers 8s 4d and boys employed at ore dressing 3s 4d. Wheelers and drivers were paid at the labourers' rate, while blacksmiths received 11s. Overall these rates were higher because of the isolation of Broken Hill.

On 45s for a full week of work a Sandhurst miner with a family could live comfortably, but few men earned the full wage through the year. All mines had periods when prospecting had to be undertaken and men were laid off. Also, when mines were not paying dividends, mine owners sacked men on wages and worked the mines on the tribute system, under which a man worked for himself and paid the owner a percentage, normally 25 per cent, of the gold he won. He provided his own tools and paid for hauling and crushing the mullock. Tributers could be dismissed immediately. In 1888 15 per cent of union members reported a period of unemployment, and few of those in employment worked for wages. Isaac Dyason reported that most claims were worked on tribute.

Throughout Australia in 1888, mining men faced constant risk of accidental death or injury. There were eight deaths and nineteen serious accidents at

Breaking the news, *painted by John Longstaff, a student at the National Gallery of Victoria, won him the first travelling scholarship awarded by the gallery. As a child in the Victorian goldmining town of Clunes, Longstaff had seen miners bearing a fatally injured man home to his cottage. Many people believed that the painting referred to the Creswick mining disaster of 1882, in which 22 miners died when a goldmine flooded. This misconception increased public interest. Oil, 1887.*
ART GALLERY OF WESTERN AUSTRALIA

Sandhurst, and Charters Towers had twelve fatal and seven serious accidents. Many men contributed to accidents by their own carelessness, such as when they returned prematurely to unexploded charges. However, no amount of care or legislation could prevent some accidents, such as sudden falls of rock. This made some miners fatalistic and therefore careless. Less noticeable but more damaging were the dusty working conditions. Lung diseases, especially phthisis, were bad at Sandhurst, but showed up only after years underground. First a miner suffered attacks of bronchitis, then he became short of breath, until even the mildest exertion produced wheezing and coughing. A Sandhurst miner was twice as likely to die in his middle age as was an average Victorian man. Old miners knew of phthisis but could not do anything about it.

QUEENSLAND AND THE FRONTIER FIELDS

In June the governor of Queensland, Sir Anthony Musgrave, and Lady Musgrave inspected a mine and attended a performance of the *Messiah* at Gympie, the oldest field in Queensland, as part of its twenty-first birthday celebrations. Gympie had produced £5 million of gold since 1867. Several mines were flooded in the February rains but the field settled down to a good year with no spectacular finds. There were no labour disputes. The eight-hour day helped to reduce accidents caused by 'overworked men breaking down'. Three-quarters of Queensland's gold output came from Gympie, Charters Towers and Mount Morgan.

Charters Towers, discovered in 1872, was in trouble by the end of the decade, but the discovery of rich ore bodies in depth in 1881 yielded large dividends and a boom. Charters Towers mine owners put on a spectacular display at the Colonial and Indian Exhibition in London in mid-1886, which coincided with a revival of the British trade cycle. The London stock exchange took up Queensland goldmines, and British investors paid high prices for Day Dawn Block (floated in London in August 1886) and Day Dawn PC (January 1887), the two show mines at Charters Towers. Many other mines in Charters Towers and elsewhere in north Queensland came under British ownership. Charters Towers boomed on rich mines and British funds. It was now a large, prosperous city of 12 000 people, where men outnumbered women by only 1.6 to 1, a sign of a mature mining field.

Mount Morgan goldfield consisted of one mine discovered in 1882. The Mount Morgan Gold Mining Company produced 3232 kilograms of gold in 1888; its shares were worth £3.5m in mid-year, and spectacular dividends made the mine the talisman for prospectors and investors across Australia. The company employed 600 men, making some 3000 people directly dependent on the mine, as well as providing work for Rockhampton foundries, local carters and farmers. The gold was very fine, and much of it washed away in the early days. The company had tried everything to extract the fine gold and the site became 'a junk yard of machinery'. Success came in 1886 with the chlorination process. The ore was crushed and dried, roasted in furnaces to remove impurities, then placed in large vats in which a chlorine solution dissolved the gold into gold chloride. The liquid was drained off and the gold precipitated on charcoal.

Charters Towers was the parent goldfield of north Queensland, and its principal frontier goldfields were Croydon, Etheridge and the Palmer River. Croydon and Etheridge goldfields adjoined each other and covered a large expanse of arid grasslands at the base of Cape York Peninsula. The town of Croydon was 200 kilometres by road east of Normanton, and Georgetown, the principal town of the Etheridge field, was 170 kilometres further east.

Croydon was discovered in late 1885 by men sinking postholes on a cattle

station. It was deserted for a year because of the Kimberley rush but boomed in 1887 as prospectors returned home. Thirty-one companies were floated. Six mills were crushing ore from twenty-five mines by early 1888 and eight more mills were being built. But 1888 was to be disappointing.

W.K. Hodgkinson, the warden at Etheridge, enjoyed patrolling his wide domain, for 'being so constantly in camp affords a singularly free and delightful life similar to that of the nomadic Arab'. The mines were scattered, small and plagued by isolation, shortage of water in the dry season, and hard living conditions. The field was not as rich as Croydon and had not shared in the boom. Its population actually rose during 1888, from 1272 at the start to 1884 at the end, but many men were moving into and out of the field. The number of miners almost doubled during the year but the number of all other European men declined a little, mainly because it was a bad year for carters and timber-getters. Frontier populations always fluctuated rapidly, but the broad contrast with established fields such as Charters Towers was clear. At Etheridge men comprised 74 per cent of the population, and women and children 26 per cent, while at Charters Towers men were 37 per cent and women and children 63 per cent.

Attitudes to Chinese miners varied between the colonies, although in most places they had been forced out of reef mines. They were free to work old alluvial fields in Victoria but in Queensland the government would expel them at the request of white miners. They were an alien group, little known and disliked by most. It was hard to know how numerous they were or how much gold they got. Chinese evicted from the Clermont goldfield in January were given rations and rail passes to other parts of the colony, but had to abandon a large investment of

Mount Morgan, by far the richest goldmine in Australia. The men are cutting ore from the summit. The mine was only 50 kilometres from Maryborough, which had grown rapidly as a port and service centre. In the six months to 30 November 1888 the Mount Morgan Company paid £225 000 in dividends and £25 000 in wages, and donated £50 to the Mount Morgan School of Arts.
OXLEY LIBRARY

labour and equipment in the alluvial workings. In April they were forcibly expelled from Etheridge at only five days' notice, which the *Queenslander* considered 'a gross outrage'. The warden at Ravenswood wrote:

> As the Celestials work in large and well organised gangs, with Californian, spear, tread-mill pumps, and other fixings of this sort, and so energetic are they, and like to be out at work, that they remove large quantities of very inferior and poor stuff, and make it pay well...

Attitudes softened if the Chinese were useful but not competitive. European selectors near the goldfields confined themselves to growing maize for forage and dairying, leaving the cultivation of vegetables to the Chinese. When the warden ejected the Chinese from Croydon, he allowed the proprietors of market gardens to remain, but not their employees. Deprived of labour the proprietors decided to leave, and began destroying their gardens. The Miners' Association then asked that four men should be left for each garden, but the regulations did not allow that. Further south, a candidate for Toowoomba in the elections for the legislative assembly claimed that he had 'never eaten a mouthful of vegetables grown by a Chinaman'. In Cooktown businessmen appreciated Chinese customs, found the Chinese reliable, and spoke up for them. The town relied on their market gardens. In European households the vegetables were welcome but not the growers for, as J.M. Macrossan, the minister for mines and works, said in a speech at Herberton in February: 'There could be no social intercourse and union between a superior and an inferior race. Wherever it had been tried it had always ended in chaos.'

The Palmer River, scene of a great alluvial rush in 1873, was now a backwater. The Palmer and other old Queensland fields held a reserve army of men ready to rush to new fields—in 1886 to Kimberley, in 1888 to Alice Springs, Yilgarn in the west and Sudest, an island to the southeast of New Guinea. 'The news of a fresh goldfield has the same effect on the nerves of a veteran digger that the sound of a trumpet has on an old war horse', a newspaper correspondent wrote.

In May David Whyte, the captain of a pearler, left Cooktown for Sudest with a party of prospectors. Whyte had heard reports of gold and persuaded Cooktown businessmen to put up some money. His party found alluvial gold, the first discovered in New Guinea, and a rush started. Four hundred men had arrived by December, most of them experienced north Queensland prospectors. But the gold was disappointing, the monsoonal rains put an end to work, and men returned to Cooktown and Normanton, many suffering from malaria and dysentery. The rush so far gave no promise of an economic base for the British annexation of New Guinea, proclaimed in September.

The goldfields of the Northern Territory of South Australia had disappointed prospectors since a rush in 1873 at the northern end. There were small gold workings near Alice Springs. In January men rushed there to a ruby field where 860 were said to be at work. The Macdonnell Range Ruby Company nearly hit a bonanza selling large claims to a British company, but the rubies turned out to be garnets, and few at that. The Kimberleys, scene of a big rush in 1886, were now quiet, with some five hundred miners scratching to make a living. Prospectors dispersed when rain fell but retreated to permanent water in dry periods. The prospecting frontier had moved south along the edge of the desert to Yilgarn, 400 kilometres east of Perth. Gold was discovered late in 1887, and in January 1888 there was a richer find nearby at Southern Cross. In January the Perth correspondent of the *Wild River Times* of Herberton reported the finding at Yilgarn of 'a mountain of gold resembling Mount Morgan'. Was Yilgarn another Mount Morgan or a Charters Towers?

Forest Range in the Mount Lofty Ranges, South Australia. Gold was found there, 30 kilometres east of Adelaide, in 1854, but the diggings were soon abandoned. Prospecting began again in the early 1880s as farmers leased claims to the diggers. Rich alluvial gold was discovered in January 1887, and soon 600 men were on the field. Three exploratory shafts use simple windlasses. Apart from the men, there is only one boy and a dog. The dark trees show secondary growth after a bushfire. Tents and lean-tos have not yet given way to houses. Despite much exploration South Australia still lacked an important goldfield, even in its Northern Territory.

SOUTH AUSTRALIAN ARCHIVES

COMPANY TOWNS

The company town grew up alongside a large mineral deposit that a company worked as a single mine. The life of the town depended on the mine. Men depended directly or indirectly for their livelihood on one main employer. Class relations and social patterns thus differed from those to be found either in larger mining cities or in the frontier fields.

Beaconsfield, in Tasmania to the north of Launceston, had a population of 2300 and was the largest town in Tasmania after Hobart and Launceston. It depended on the Tasmanian Gold Mining Company, which had produced £825 000 of gold and paid £495 750 in dividends from July 1878 to the end of 1887. The huge dividends underwrote the prosperity of Launceston but not of Beaconsfield, whose people had no municipal government or civic pride, poor sewerage facilities and bad health. Mount Bischoff, 170 kilometres west of Launceston, was the fourth-largest town in Tasmania. One of the biggest lode tin mines in the world had been found there in 1872. Dividends approached £1 million. The ore was crushed in a 175-head stamp mill, then dressed and concentrated with elaborate machinery. The whole works was lighted by electricity. The dressed ore was then shipped to smelters in Launceston. For every £1 paid in wages and working expenses, £3 left the town in dividends.

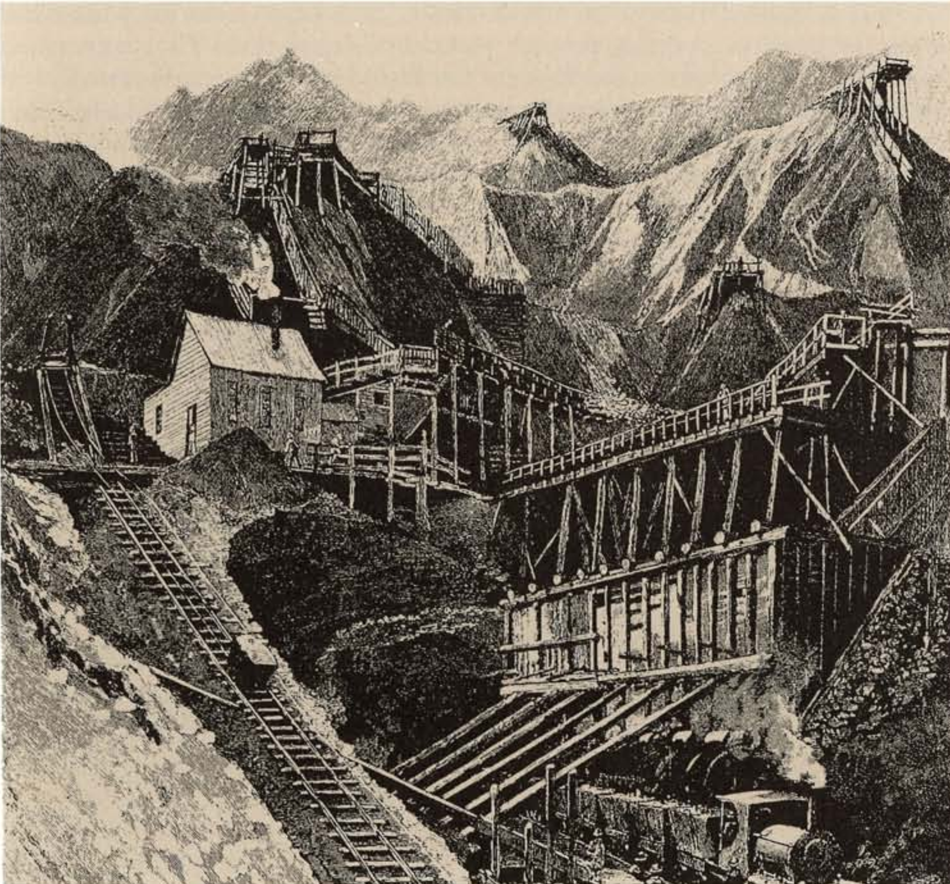
Cobar, in central New South Wales, 200 kilometres south of Bourke, was under threat of closure from a slump in the price of copper, rising costs as the mine got deeper and high transport costs. The promised extension of the railway from Nyngan would help. The low price of copper almost closed the mine in 1888, and men were put off. Several hundred men left their families and dispersed in search of work, but the mine was in full swing by June, employing 400 men. Three thousand people depended on the mine. The town lay on a dusty flat, with the original light tree cover now all gone. Substantial brick houses stood among wood and adobe huts. North Cobar had solid public buildings and the main hotels, banks and shops. South Cobar, where most of the miners lived, was known as Cornish Town. Nymagee, to the southeast, was another large copper town.

Broken Hill, the magical silver city, had enormously rich silver deposits. It was a bonanza field in transition to a company town. It had 8000 people and was growing rapidly. The Broken Hill silver lode resembled a giant boomerang planted on a north–south axis in the earth, with the apex of the boomerang jutting out.

The top part of the lode was discovered in September 1883. By mid-1886 when mining really got going, the Broken Hill Proprietary Company owned the central blocks on the lode and was already the 'Big Mine'. The new American mine manager Patton introduced a system of square-set timbering that allowed any width of lode to be taken out and was safer and cheaper than the old workings that looked, to a New Zealand mining visitor, like 'a series of rabbit-warrens on a large scale'. The new method was strongly resisted by the Cornish miners, 'the most conservative class of workmen that can be found', the visitor believed.

Great riches of silver had already been discovered. They were the basis of a tremendous speculative boom, with share prices soaring in Melbourne and Adelaide. BHP shares had started the year at £180, and rose to £414 by the end of February. They ended the year at £295, still a good price because of the immense wealth of the mine. In Adelaide, when the Reverend G.B. Edwards was sued for an alleged breach of a forward contract in Broken Hill South shares, the Wesleyan Methodist Church reprimanded him for 'engaging in business pursuits to an extent incompatible with his position as a Methodist preacher'.

Life in Broken Hill was hard. Water was expensive, housing was primitive and the streets were full of dust. The town was raw, and so were relations between mine owners and workers. The original committee of the Broken Hill branch of the Amalgamated Miners' Association, established in January 1886, included businessmen, publicans and a bank manager, but a Mining Managers' Association was established in October 1886 and by 1888 stood opposed to a worker-controlled AMA.



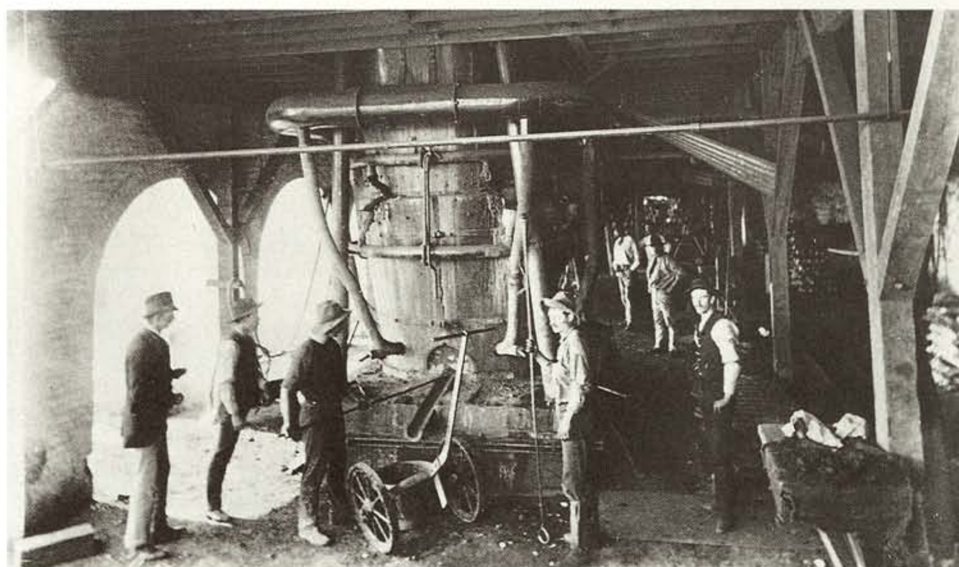
Mount Bischoff tin mine, Tasmania. A. Garran (ed), Picturesque atlas of Australasia, *Sydney 1886–88.*

NEWCASTLE

People throughout the colonies depended on coal for the manufacture of gas, for trains and steamers and as domestic fuel; but few knew or cared where the coal came from until the long strike at Newcastle, from August to November.

With more than six thousand men employed directly in the mines and no other industry of any importance, the Newcastle coalmining district contained the largest concentration in the continent of working men in a single occupation. Many of them had migrated direct from the English coalfields of Durham and Northumberland and transplanted intact their attitudes of loyalty to mates and union solidarity; and the creation of strong class consciousness was further reinforced by the large size of the companies for which they worked. The Wallsend Company employed 1212 men, and the Australian Agricultural Company 919 in its three pits. These and eight other large companies together accounted for 5000 men. Four out of five men worked underground, with the rest at the surface loading coal or stoking boilers.

Miners' piece rate wages rose and fell on a sliding scale with the price of coal. Since 1883 the hewing rate had stood at 4s 2d per standard ton of coal hewn, but the difficulty was to agree upon a standard ton of coal (a ton of coal was a fraction less than a tonne). A miner in a narrow seam cut less coal than a miner in a large seam and miners and owners had to negotiate a 'consideration' for the narrow ore. There were other considerations for water seepage, excessive waste rock in the ore, bad ventilation and difficult timbering. Even with goodwill and agreement on complex lists of considerations, the weekly wage was still a gamble. To even things out, miners 'cavilled'—drew lots—to determine their place in the pit. Miners had to pay for their own candles, powder, picks, shovels and drills. They were stood down from time to time if stocks were too high. Jesse Gregson, the manager of the AA Company, estimated that the men worked on average five and a half days a week through the years 1885–87. The wages sheet for the fortnight 9–23 June 1888 shows that the average rate for the 388 miners was 8s 7d a day or 51s 6d a week. Of these miners over one-fifth made £3 a week, the wages of a skilled artisan. At the other end of the scale, one-quarter made less than £2 and were little better off than unskilled labourers.

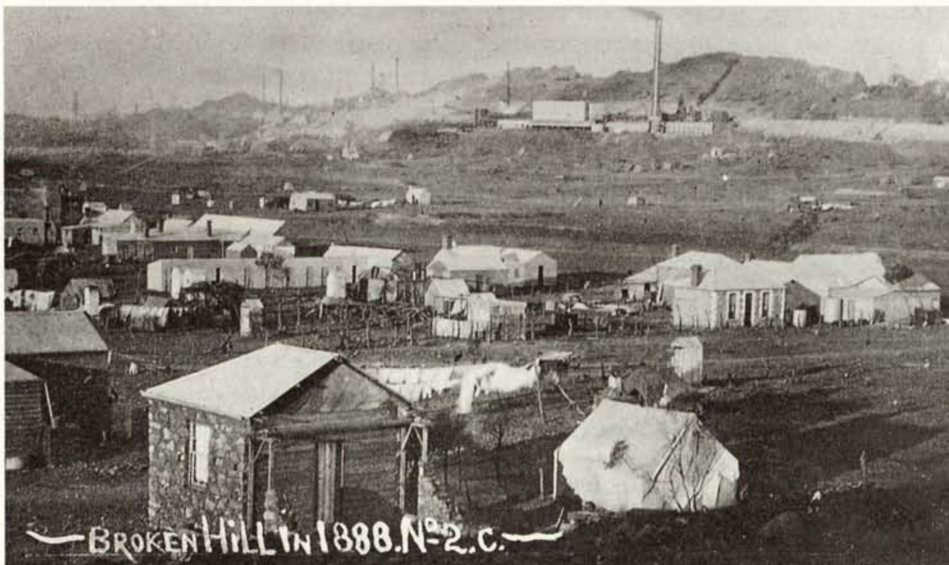


Herman Schlapp, far left, supervises the starting of number 5 smelter at the Broken Hill Proprietary mine in June 1887. W.R. Wilson, a director of the company, visited several silver mines in the USA and negotiated with Schlapp in Colorado. Schlapp arrived in Broken Hill in April 1887 to introduce American metallurgical techniques. BHP was the first Australian mining company to import American skills.
BHP ARCHIVES

In September a special correspondent of the Melbourne *Age* described life in the pit villages. Most houses were built by the miners themselves in clusters of low, small cottages, placed without reference to street patterns. Paths wound among the fences and fell into straggling drains that followed slopes through the village. Most cottages had small yards or gardens, but there was very little other vegetation to soften the landscape. Cottages were built of slabs, sun-dried German bricks or ordinary building timber. Shingle roofs were giving way to galvanised iron. If the miner could afford it, he boarded the inside of his cottage, otherwise he covered the interior with canvas or paper. The German brick buildings were coated with tar to prevent water damage, and this gave the villages a black appearance. The houses were furnished with plain furniture and cheap crockery or tinware. Here and there were efforts at decoration, 'in the way of cheap prints or china ornaments, or women's fancy work and there may be a few pretty flowers in the garden or a creeper climbing up the wall'. The overwhelming impression was of 'bare severity and much that is hard in the lines of life'. Boys were set to work as soon as possible, and only where several sons worked was the family well off. Storekeepers gave credit, and 'many long months and years of pinching have to be endured to pay off the score of a strike or a stretch of slack work at the pit'. The correspondent found 'no signs of luxury among the colliers of Newcastle, they stand just above the bare necessaries of life, and only sometimes rise to touch its comforts'.

At the centre of trade union organisation in Newcastle was the lodge, one for each pit, and each lodge elected a delegate to the union. The union was a federation of lodges, and had only limited powers over them. Men were often more loyal to the lodge and to the village than to the union. After a strike in 1873, the Lambton men resumed work without the consent of the union leaders, while in 1886 they alone stayed out for eight months before conceding failure. Lodges often fought local battles, but in union is strength and strength was needed to negotiate a federal agreement on the hewing rate and considerations. Early in 1887 the proprietors broke the agreement of June 1886. They disliked the arbitration rules and some other provisions; the union protested, but high coal prices through the year kept the peace for the time being.

Tension mounted in the early months of 1888. In July the union demanded a new agreement, and on 28 July the men voted at a mass meeting to strike if need



By the end of 1888 Broken Hill had a population of almost 1700. There were nine banks, 47 hotels, six churches, a masonic lodge, two newspapers and a primary school. The town was laid out in a grid with the main street, Argent Street, running parallel to the line of lode, which can be identified by the row of smelter chimney stacks. The evolution of building materials is clear; tents, stone and timber buildings, finally galvanised iron houses. In summer the iron houses were furnaces for housewives and for night-shift men sleeping during the day.
BHP ARCHIVES

be. The proprietors used this decision as an excuse not to negotiate and the men struck on 24 August. Silence fell on the villages as the pits closed, the coal trains stopped and the men stayed at home. The sky was clear; no black clouds now came from the 'tall smoking chimneys' that had so impressed the *Age* journalist.

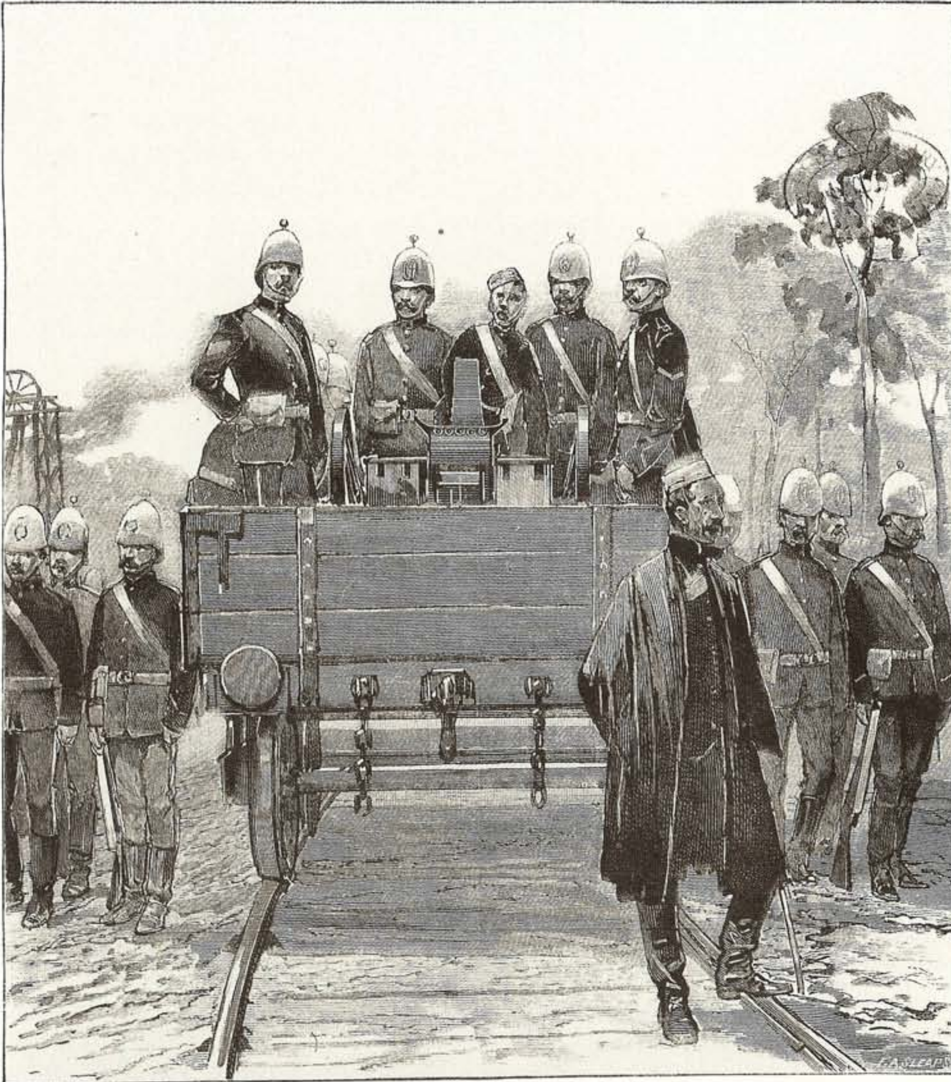
The union and the proprietors met on 7 September but disagreed on the definition of a standard coal seam. This, multiplied by the hewing rate, gave the basic take-home pay. The union proposed a wider seam as standard, of six feet rather than 5 feet (1.8 metres instead of 1.5 metres) and a hewing rate of 4s 6d per ton. There was then a complex scale, with higher rates for narrow seams and for those containing more than the standard width of waste rock. This amounted to a general increase in wages, and the proprietors refused. The Greta colliery now advertised for men in Sydney, and received 1200 applications. When twenty-five men arrived in Newcastle under police protection, they were hooted by an angry crowd, but there was no violence. At the Lambton pit, coal was also loaded under police protection. One of the labourers, spotted in the streets of Newcastle, was pursued by a crowd of 100 men and boys, but after a long chase found refuge in the wharfinger's office. The *Sydney Mail* considered this to be dangerous mob violence and reported that public feeling was now hardening against the miners. The other view was to ask whether 100 men and boys could not have caught one frightened fugitive if they had wished.

The worst violence took place on 18 September at New Lambton where six non-union labourers were working under the protection of 30 policemen. A crowd of 200 to 300 gathered and a miner, Frith, called on his fellows to take the labourers away without harming them. Sub-Inspector Lynch told Frith that he was breaking the law, and Frith withdrew into the crowd. Later in the day someone threw a piece of coal, and the police rushed into the crowd and grabbed Frith. A policeman later said he had seen Frith with a lump of coal in his hand, but Frith denied it. The crowd was now over six hundred. Lynch sent for reinforcements, but did not need them. Harry Evans, respected alderman and miner of Adamstown, addressed the crowd. He asked the miners to show that they were men and let the 'blacklegs' go. Alfred Edden of the South Waratah lodge supported him. Sub-Inspector Lynch then allowed Adams and Edden to interview the labourers, who agreed not to return to the pit. The crowd then dispersed 'good humouredly'.

Miners' cottages, Newcastle. A. Garran (ed), Picturesque atlas of Australasia, *Sydney 1886–88.*

The next stage in the strike occurred when the proprietors broke ranks. The Stockton Company negotiated a contract with the Melbourne Metropolitan Gas Company, for 200 000 tons of coal over three years at 11s a ton. The company agreed to pay its miners 4s 2d per ton, regardless of fluctuations in the price of coal, and to employ union labour only. This hewing rate was less than the amount demanded by the union but was acceptable to the Stockton miners, whose average wages were 2s per day above the district average. Although there were some objections at other pits to this return to work, the Stockton men were allowed to resume work on the understanding that they contributed 7s 6d to the strike fund. Stockton reopened on 4 October. This was encouraging for the men, but despite financial support from trade unions throughout the colonies, they and their families were now desperate. The union requested a conference. The two sides met on 21 October, a new draft agreement was drawn up and a ballot of 3491 miners accepted it by a small majority of 227.

The strike ended on 24 November. The mine owners won the main point—a standard seam of 5 feet, not 6 feet and a hewing rate of 4s 2d, not 4s 6d. But the agreement was not a total defeat for the miners. The defection of Stockton and the cost of week after workless week induced the owners to grant extra considerations for difficult workplaces, and to accept arbitration. Disputes were now to be settled



The New South Wales Artillery at Adamstown, Newcastle. On 18 September 1888, six non-union labourers were engaged to remove coal from the New Lambton mine at Adamstown, protected by 30 police. A crowd of several hundred gathered and called on them to stop work. The disturbance that followed was described by the Sydney Morning Herald *as the 'riot at Adamstown'. Although admitting that coal was thrown at the blacklegs, the Melbourne* Age*'s account is calmer; it reported the violence as verbal rather than physical. Sir Henry Parkes sent a detachment of artillery and a Nordenfeldt machine gun, mounted on a railway truck, to secure the peace. Seven men were arrested, but local juries refused to convict them. Men arrested at later disturbances were tried in Sydney. Three miners were given short sentences.* Illustrated Australian News, *13 Oct 1888.*

by a referee appointed by the Chief Justice in Equity. The new agreement also confirmed the eight-hour day, first granted in 1886. The miners had gone without wages for sixteen weeks.

The strength of the union and community reflected the strong class divisions of Newcastle. The 1888 strike was an episode in a history of class antagonism, now fifty years old. Newcastle remained a closed world, but the curtailment of coal supplies had forced the rest of eastern Australia to take note of the power of unionism.

The large mining cities were an important feature of the regional mosaic in 1888. They added diversity to the land-based industries, and provided markets for foodstuffs and materials; they acted as parent fields and provided capital and men for the mining frontiers. In most colonies the mining cities were the largest provincial cities and the only urban counterweights to the political and economic dominance of the capital cities.

Charters Towers

'The town is changing in aspect day by day', wrote the mining warden at the end of 1887. 'Bark has given way to weather-boards, and now the latter has to make room for brick and mortar.' Most miners owned their own cottages, as building sites were free.

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Cities from the sky

Bird's-eye or isometrical views, painstakingly reconstructed by earth-bound artists and engravers, were a regular feature of illustrated magazines in the 1880s. They reflected the pride of Australians in the growing size and sophistication of their cities and their desire to savour 'a sense of their metropolitan vastness'. Melbourne, the most extensive of the capital cities, occupied as much territory as London, and even Sydney and Brisbane, hemmed in by harbour and river, sprawled farther than their American or European counterparts.

Illustrated Sydney News, *30 Aug 1888.*