AUSTRALIAN
MINING
HISTORY
ASSOCIATION

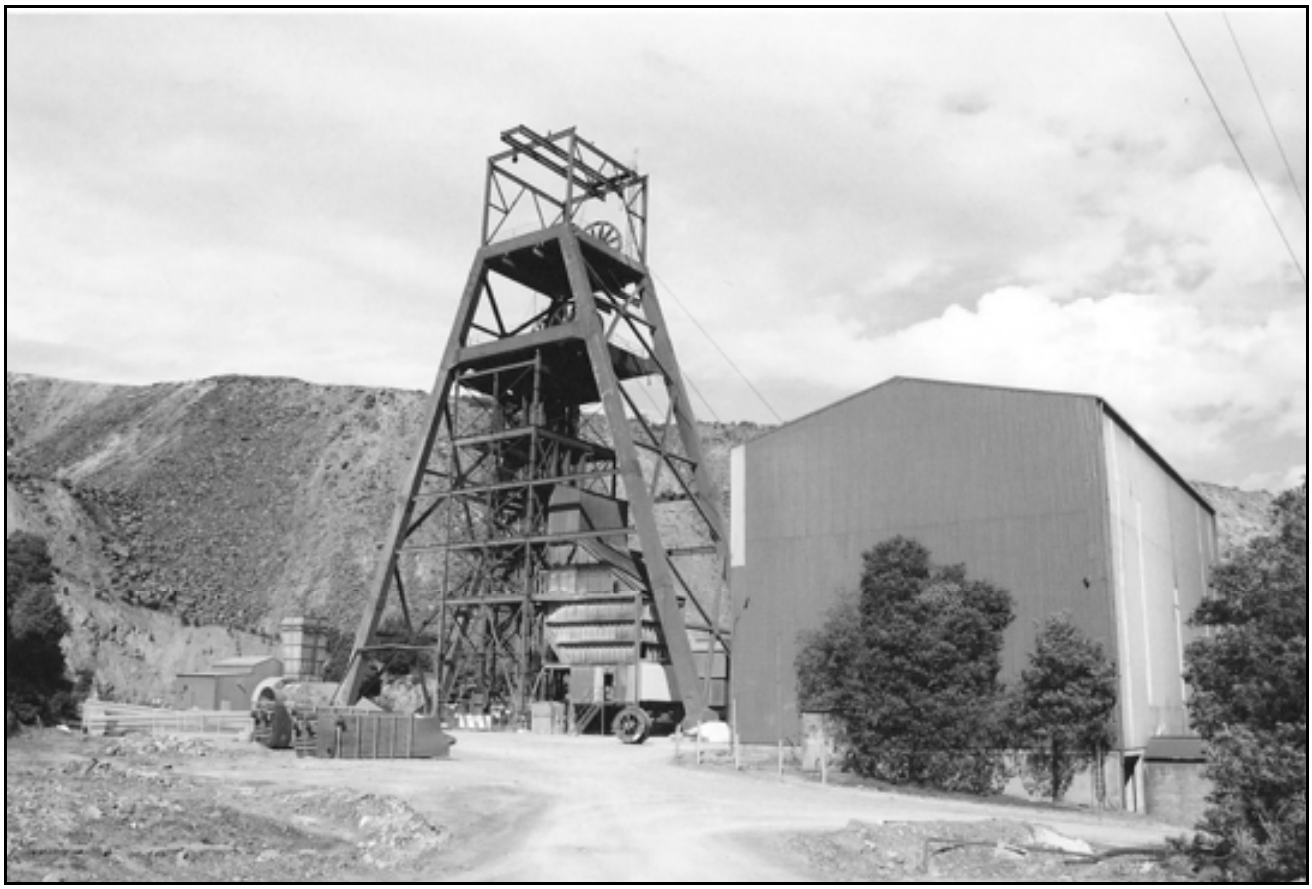
14th ANNUAL CONFERENCE

Queenstown, Tasmania

4–10 October 2008

Queenstown Post Office, built 1902

Mt Lyell Mine (Iron Blow), looking south towards Gormanston, c.1960



Mt Lyell Mine, Prince Lyell No.1 Shaft headframe & winder house, April 2008

MAYORAL MESSAGE

First of all let me extend to you, on behalf of the West Coast, a warm welcome to a region that has an immense amount of mining history. From the early aboriginal inhabitants of this area who mined ochre for ceremonial purposes and flint for hunting and food preparation and the convicts who also extensively mined this area, the Mt. Read geological belt has seen and experienced many small and large mining operations for over a century.

The history and heritage of all these mining operations must be preserved and recorded where practical, as should the efforts of those who endured extreme hardships in opening up the old mine workings that still exist today. These old sites are extremely sensitive to visitation and may never be opened up to tourism, but there are still many sites that could provide an historic and educational experience in a controlled environment.

West Coasters are fiercely proud and protective of their mining heritage as many West Coast families are descendents of those pioneers who explored and extracted the area's wealth. For those mines that became productive there are many others that failed and those failures should also have their place in history.

A good example of the West Coast's heritage commitment is in the fight to preserve the Lake Margaret power station. The overwhelming community support generated, enabled the power station to be heritage listed and the station is to be re-commissioned using its basic historic infrastructure.

We, on the West Coast believe that the ingenuity of the West Coast's mining pioneers should be examined when current engineering practices are required as we are of the firm belief that you must look backwards to go forward.

We hope you have a successful conference and more importantly the time to enjoy our rich mining heritage.

Darryl Gerrity
Mayor, West Coast Council

AUSTRALIAN MINING HISTORY ASSOCIATION

PRESIDENT'S FOREWORD

On behalf of the AMHA executive and the Tasmanian organising committee, I welcome you to our 2008 conference in Queenstown. This is the Association's fourteenth annual conference, and our sixth consecutive conference in a major historic mining centre. Our five most recent conferences have been held in Broken Hill, Newcastle, Bendigo, Kadina and Armidale, and there is no question that our members respond enthusiastically to conferences held in historic mining settings.

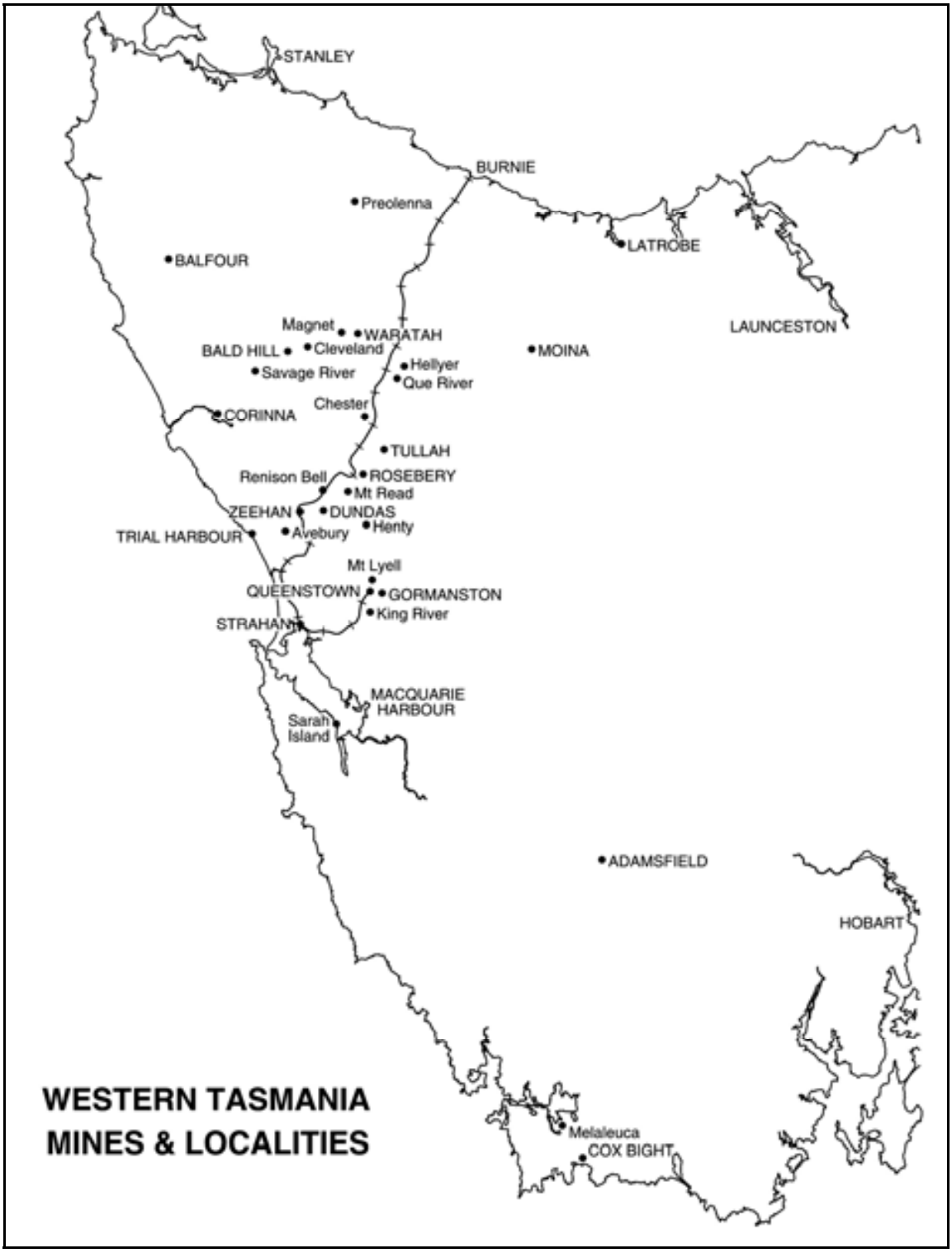
Queenstown is one of Australia's legendary base metal mining centres, famous for over 110 years for both the value of its copper and gold production, and the community spirit engendered by its rugged West Coast setting. This was a mine where geography meant everything; you cannot understand the history of Mount Lyell without understanding its relationship with the mountains and the sea, and its distance from everywhere else that mattered. Appropriately, a large part of our conference will be spent exploring Mount Lyell's surroundings. We have several papers putting Mount Lyell in the context of Australian mining, bringing new insights to the story.

This year is the 125th anniversary of the beginning of the Mount Lyell mining field. It was November 1883 when Steve Karlson and the McDonough brothers found gold at the Iron Blow, and pegged the first lease of what was to become the Mount Lyell mines. It wasn't much of a gold mine, and all the discoverers lost their money and sold their shares, but twelve years later it was attracting capital from London and metallurgists from America, and growing to become one of the great copper mines of the world. It is a classic story of the mining industry's struggle to amalgamate leases under one management, and find the capital and technology to develop the resource: the combination necessary to transform small mines into large ones. And let us not forget that large mines create the setting for large disasters. In 1912 an underground fire in the North Lyell mine killed 42 workers: the worst death toll in an Australian metalliferous mining accident.

Mount Lyell plays an important role in Australian mining history for other reasons. In 1954, Geoffrey Blainey at the age of 24 published his first book, *The Peaks of Lyell*, a history of the Mount Lyell Mining and Railway Company. At the time, Mount Lyell was Australia's largest-producing copper mine, although it has since been overtaken by both Mount Isa and Olympic Dam. I regard Blainey's book as the beginning of Australian mining history. There had been many earlier books on Australian mining, but most were either written in the local history tradition of eulogising the pioneers, or dry technical works written by company staff. Blainey's approach had something for everyone: well-researched so the facts were reliable, a balanced approach to the winners and losers, giving the view from both the boardroom and the stopes, setting the technological and economic scene in an international context, academically highly respectable but an effortlessly readable yarn. Blainey went on to write a number of other important books on Australian mining history, greatly popularising the subject. This association would not exist without his work. In the decades since he has been joined by many others, so mining history today is well served by publications, and is a thriving sub-discipline in several Australian universities.

The conference could not have happened without the enthusiastic support of West Coast organisations and community members. I thank the West Coast Council, Michael Purtell and the Silver Hills Motel, Geoff Cordery and Copper Mines of Tasmania, Jo-Anne O'Brien, Mineral Resources Tasmania, Workcover Tasmania, TAFE Tasmania, John Halton and the Queenstown Rotary Club all of whom have helped to make the conference possible. I also thank the members of the organising committee, Greg Dickens and Steve Newett in Hobart, Nic Haygarth in Launceston and Greg Drew in Adelaide, and our Secretary/Treasurer, Mel Davies in Perth for his wisdom and many skills.

Dr Peter Bell
President, AMHA



PROGRAM

Saturday 4 October

9.00 am	Bus pickup at Avis Rental depot, Hotel Grand Chancellor in CBD
10.00 am	Bus pickup at Launceston Airport
12.00-12.15	Arrive Burnie and Emu Bay
1.15-3.30 pm	Lunch at Bischoff Hotel, Waratah and visit Mt Bischoff Mine
3.30-5.00 pm	Travel to Tullah and stop at Rosebery
6.00 pm	Arrive at Queenstown
6.30-8.00pm	Welcome reception hosted by West Coast Council at Penghana, Queenstown

Sunday 5 October

8.30-9.30 am	Registration at Silver Hills Motel, Queenstown	
9.30-9.40 am	President's Welcome, Peter Bell (Chairperson for Keynote address)	
9.40-10.30 am	Keynote Speaker – Prof. Geoffrey Blainey:	*Researching Mt. Lyell*
10.30-11.00 am	Morning tea	
11.00-12.30 pm	***Session 1 – Transport*** – Chairperson: Mel Davies	
	Peter Brown:	*Routes to the West Coast*
	Ruth Kerr:	*Recap Mines and Tramway on the Chillagoe Field - its connection to southern Australia and Queensland politicians 1890 to 1920s*
	Tony Weston:	*Mining lower grade ore through changes in mining technology at the Mount Lyell Mining and Railway Company, Queenstown, Tasmania from 1931 to 1938*
12.30-1.30 pm	Lunch	
1.30-3.00 pm	***Session 2 - Geology/Environment*** – Chairperson: Ken McQueen	
	Keith Corbett:	*From Blow to go - a geological take on the early days of Mt Lyell*
	Leonie Knapman:	*Weather versus Glen Davis*
	Barry McGowan:	*Booms, busts and the environment: the life and times of the base metal mining community of Captains Flat*
3.00-3.30 pm	Afternoon tea	
3.30-5.15 pm	Visit Lake Margaret Power Station	
7.00-10.00 pm	AMHA Conference Dinner, Silver Hills Motel	

Monday 6 October

8.30-10.15 am	Visit Iron Blow	
10.30-11.00am	Morning tea	
11.00-12.30 pm	***Session 3 - Labour/Gender*** – Chairperson: Anne Both	
	Wendy Fowler:	*Convicts and Salt Water River Coalmine Research Project*
	Pam Sharp:	*Millie's Story: Women, domesticity and commerce in Gwalia and Leonora*
	Roger Kellaway:	*New Zealanders and the Zeehan Silverfield 1891-1895*
12.30-1.30 pm	Lunch (1.00 pm start for underground mine tour)	
1.30-3.00 pm	***Session 4 - Mining personalities*** – Chairperson: Sandra Kippen	
	Richard Allsop:	*Was Mt Lyell a better teacher than Oxford?*
	Philip Hart:	*A carter, a businessman, and a prospector with several things in common*
	Nic Haygarth:	*Chasing a shadow? T.B. Moore, Robert Sticht and the Balfour copper boom*
3.00-3.30 pm	Afternoon tea	
3.30-6.00 pm	Mt. Lyell Mine Tours	
7.00-8.00 pm	Visit to Spion Kop Lookout	

Tuesday 7 October

8.30-10.30 am	***Session 5 - Health & Safety*** – Chairperson: Peta Chappell.	
	Anne Both:	*From a tent to a modern hospital: the role of mine and community in Queenstown health care*
	Marita Bardenhagen:	*Invisible women - Bush Nurses at Adamsfield*
	Adrian Hutton:	*Bulli and Appin Mine Disasters – Who was to Blame?*
	Peter Schulze:	*Tragedy at the Mt Lyell Mine, 1912*
10.30-11.00 am	Morning tea	
11.00-12.30 pm	***Session 6 - Materials*** – Chairperson: Nic Haygarth	
	David Branagan:	*The Oldest Marble Quarry in Australia*
	Greg Drew:	*Pugholes and Brickworks of Adelaide's Western Suburbs*
	Ken McQueen:	*Quidong Mineral Field, NSW: An intriguing discovery of W.B. Clarke*
12.30-1.30 pm	Lunch	
1.30-3.00 pm	***Session 7 - Heritage*** – Chairperson: Peter Claughton	
	Ross Both:	*Gilles v the Glen Osmond Union Mining Company*
	Geoff Cordery:	*The Mt Lyell Mine - Challenges of operating a large mine in a heritage environment*
	Jo Field:	*Getting lost in the Myths: Blue Tier mining history at risk*
3.00-3.20 pm	Afternoon tea	
3.30 pm	Mt Lyell Disaster Ceremony, South Queenstown	
4.15-6.00 pm	**AMHA ANNUAL GENERAL MEETING (members only) -** or Cemetery visit South Queenstown for non-members	
6.30-9.30 pm	Rotary Dinner at RSL Club, Queenstown	

Wednesday 8 October

8.30-10.30 am	***Session 8 - Technology*** – Chairperson: Prof. David Branagan.	
	Jim Enever:	*'Not for Want of trying': The history of the Coopers Creek Copper Mine, Victoria*
	Peter Claughton:	*Mining on the frontier: some comparisons in the working of precious metals at the extremities of English/British rule*
	Richard Hartley:	*Sons of Gwalia gold mine: reasons for operational longevity*
	Nicola Williams:	*FINE or FORGED: Precious Metal Assay through the ages*
10.30-11.00 am	Morning tea	
11.00-12.30 pm	***Session 9 - Tasmanian Exploration & History*** - Chairperson: Dr. Ruth Kerr.	
	Donald Perkin:	*History of the discovery of gold and iron ore and the development of the magnetite deposits at Savage River, NW Tasmania, from 1877 through to the 21st Century*
	Tim Jetson:	*"That some rich lode amongst these hills is waiting for us yet"*
	Greg Dickens:	*Mining in Western Tasmania - A brief history of exploration and development*
12.30-1.15 pm	Travel to Strahan	
1.15-1.45 pm	Lunch at Strahan	
1.45-3.00 pm	Tour Strahan and Regatta Point	
3.00-7.00 pm	Regatta Point to Queenstown via Abt Railway	

Thursday 9 October

8.30-10.00 am	Travel to Zeehan & Zeehan Smelter
10.00-10.30 am	Morning tea at Central Hotel, Zeehan
10.30-12.00 pm	West Coast Pioneers Museum
12.00-1.00 pm	Barbeque lunch at Central Hotel, Zeehan
1.00-2.00 pm	Visit Spray Tunnel area
2.00-3.30 pm	Visit Renison Bell
3.30-4.15 pm	Return to Queenstown
4.15-5.45 pm	Queenstown Walk, including Galley Museum and Penghana
7.00-9.00 pm	Sunset Tour (Mt Jukes Road) and second underground mine tour

Friday 10 October

8.00-9.00 am	Queenstown to Tullah
9.00-11.00 am	To Sheffield via Cradle Mountain Link Road
11.00-11.30 am	Morning tea
11.30-1.00pm	Bus travels to Launceston Airport
1.00-1.30pm	Bus travels to Launceston City Centre

Orr Street, Queenstown, looking south-east towards Mt Owen, 1896

ABSTRACTS

Was Mt Lyell a better teacher than Oxford?

Richard Allsop

My PhD on 'The Works of Geoffrey Blainey' is attempting to meet a challenge posed by Graeme Davison in the *Oxford Companion to Australian History*. Davison lamented that existing studies of Blainey's work were 'mostly polemical in approach'. He believed there needed to be 'a more mature assessment' of Blainey's work that would 'illuminate more clearly the personal and ideological dimensions of his maverick career, as well as acknowledging the sustained creativity, intellectual range, pervasive influence, and literary distinction of his writing'. The view of the academy that Blainey was something of a 'maverick' can be traced all the way back to 1951. That was the year when, if Blainey had followed the conventional approach of first class honours graduates from the History Department of Melbourne University, he would have headed off for further study at Oxford. Instead, Blainey came to Mt Lyell and wrote about a very different topic, and in a very different way, to that which his contemporaries were doing at Oxford. Blainey's time here, and his subsequent ten years as a freelance historian, largely earning an income from writing commissioned histories, certainly gave him a different perspective on history to other historians of his generation. Crucially, this enabled him to write a different version of Australian history, one that takes account of a range of important factors that other historians have tended to neglect.

Invisible women - Bush Nurses at Adamsfield

Marita Bardenhagen
Research Officer, Heritage Tasmania

Adamsfield is an example of a particular type of experience in mining history. It was an osmiridium mining town, one of the most isolated communities in south-west Tasmania. Memories of the place allow us to reflect on health professional interactions and the role of women as pioneers and health care providers during the first half of the twentieth century. But this history is not available in the voluminous mining reports. Archaeological investigations may be able to locate the remnants of the town now camouflaged by the bush, but oral histories provide the 'flesh on the bones'. By examining the lives of Bush Nurses that were sent to serve in this community we can also catch glimpses of another group that is absent from the records—women that shared the digs with their men. We have no artefacts that tell us of the makeshift tents in the mud and snow. There are no extant buildings that show us the living conditions for families. The Bush has wrapped all evidence into its dense growth. Unlike urban history where artefacts and records still exist, rural and bush environments disappear from the landscape more rapidly. Evanescent mining towns are even more susceptible to losing their sense of place. Some photographs exist but even these can deceive and can contribute to false impressions. The voices of Bush Nurses have been captured in letters held in the DPH and more importantly in oral histories that have recently captured what life was like for women in a harsh male dominated town. The conflict and contradictions between the public record and the recorded voices of Bush Nurses offer another dimension to the history of Adamsfield. How does the historian diffuse and interpret these opposing views? Perhaps these dilemmas in themselves offer another layer of understanding of Adamsfield - a ghost town.

Keynote Paper - Researching Mt. Lyell

Geoffrey Blainey, AC.

From a tent to a modern hospital: the role of mine and community in Queenstown health care

Anne Both

The present day West Coast Health Centre, now funded by both the Tasmanian and Commonwealth Governments, had its genesis in 1895 under the joint auspices of the Mt Lyell Co and the mining community. The Mt Lyell Co and the growing population of the district perceived the need for "the formation of a fund or society of some kind for the immediate assistance, surgically etc. of the many residents of the district ...". The District Accident Society was formed, and the resident engineer of the Mt Lyell Co was asked to deduct subscriptions from mine employees' pay. As the town and workforce grew so did the Society (later the Queenstown Medical Union). The community began to raise funds and the Tasmanian Government was petitioned for assistance to build a hospital to serve the district needs. With the continued growth of Queenstown, and the decline of the townships of Zeehan and Strahan, the hospital became the chief medical facility for the west coast. Although the nature of the modern Health Centre differs somewhat from that of the original hospital, it continues to serve Queenstown, Zeehan, Strahan and district. The paper explores the genesis of the hospital, the changing roles of the Mt Lyell Co and the community in its first fifty years.

Gilles v the Glen Osmond Union Mining Company

Ross A. Both
Adelaide University

The Glen Osmond Mine was one of a group of silver-lead mines that commenced operations in the early 1840s in the foothills of the Mount Lofty Ranges near Adelaide. These were Australia's first metalliferous mines and represented the start of South Australia's first mining boom. The Glen Osmond Mine was located on property belonging to Osmond Gilles, the first Colonial Treasurer of South Australia. Osmond Gilles' brother Lewis came from Tasmania to direct operations. Lewis subsequently purchased the lease of the mine from Osmond and went to London to form the Glen Osmond Union Mining Company. He was appointed General Superintendent of the mine and, following his return to Adelaide, the company commenced its operations in December 1846. Work was suspended in January 1849 when a writ was issued by the Supreme Court of South Australia on behalf of Osmond Gilles, seeking to have the company ejected from the lease on the ground of non-payment of royalties. Osmond Gilles was unsuccessful and operations were recommenced and continued until closure of the mine in 1851. This paper will review the reasons behind, and the outcome of, the court case and the role of the personalities involved in the dispute, particularly the Gilles brothers.

The Oldest Marble Quarry in Australia

David Branagan
School of Geosciences, University of Sydney

In the second volume of Thomas Mitchell's *Three Expedition into the interior of Australia* … (1838) he devoted a sentence or two to a visit he made to an interesting site, not far from his Great Southern Road. Near the Wollondilly, and a few miles from Towrang, a quarry of crystalline variegated marble has been recently wrought to a considerable extent, and marble chimney-pieces, tables etc. now ornament most good houses in Sydney. This marble occurs in blocks over greenstones and has hitherto been found only on that spot. The marble was apparently first located by an early settler, Peter Stuckey, who established the property, *Longreach*, on the bank of the Wollondilly River in the 1820s, near where the quarry occurs. Stuckey made the original development, but apparently found the operation too difficult, and passed it on to the government. The site was visited in the 1840s by the geologist, the Rev. W.B. Clarke who saw that the altered limestone was fossiliferous, despite previous comments that it did not contain fossils. Several specimens of the 'prepared' marble were taken to England by a Captain Baker and presented to the Rotunda Museum, Scarborough. The quarrying for marble only lasted a few years and was replaced by an operation using the material for lime. This activity also faded out when larger sources were located. However the site is still accessible and some evidence of the site's two lives as a mining centre can still be studied.

Routes to the West Coast

Peter Brown

The end of the 19th century saw a strong interest in linking the rising fortunes of the new mines of Western Tasmania with the commercial centres of Launceston and Hobart. The tumult of the various railway routes has been well documented as the 'Railway Wars' but the poor cousin of these grand schemes was the overland tracks. Rough pioneering tracks had been cut into this country from the 1850s, which led to the spate of mineral discoveries at Zeehan, Rosebery, Queenstown and other smaller fields. In the time of the Railway Wars, a series of substantial tracks were proposed between Central and Western Tasmania. Possibly as part of the overall hysteria of the Railway Wars, the public interest in these tracks was intense, but of all the proposals only a few of these routes were cut by the Public Works Department. These were the Linda Track from Marlborough, near Lake St Clair, to Linda, near Queenstown; the Mole Creek Track from Liena near Mole Creek to Rosebery and; the South Gordon Track from Tyenna to the Gordon River. The stories of these tracks have been obscured by the more sensational railway proposals and the work of the track cutters has been almost entirely forgotten. The main aim of this talk is to examine the success, or otherwise, of these tracks, the art of their construction and the life of track cutters, using the Mole Creek Track as the main example.

The Mt Lyell Mine - Challenges of operating a large mine in a heritage environment.

Geoff Cordery

Environmental Manager, Copper Mines of Tasmania

Mt Lyell has a rich mining and cultural heritage and has been the stage for many "firsts" in the mining and metallurgical fields. This has created a diverse and abundant catalogue of heritage features and stories that now provides challenges to the historian, conservator, mine operator, environmentalist and legislator. Along with the rich mining and industrial heritage, there is a wealth of European cultural, Aboriginal, geological and natural heritage. Copper Mines of Tasmania is working to achieve a realistic and sustainable environment where heritage can be conserved and balanced with the needs of production, community growth, environmental protection and public safety, though this has its challenges.

Heritage features and historic documents are plentiful, relatively well preserved, maintained and documented. The mid 1990s saw a detailed heritage inventory compiled that was the basis for a heritage management plan for the site. Heritage on site is protected by legislation and specific conditions on land use. Our most significant challenge is the scale of the site which is still operational. Should the mine cease production the formal closure plan allows for the conservation of heritage together with potential future mineral, tourism and other land uses.

Awareness and competing perceptions are challenges and effort has to be made to protect documents, retain the integrity of the cultural landscape, but also ensure that a balance exists between conservation and problems associated with health and safety issues. One recent problem has been associated with storage of information, with some digital records from the 1970s to 1990s no longer useable due to changes in computer technology. With a commitment to responsible conservation, Copper Mines of Tasmania has a heritage management plan in preparation to ensure a sustainable environment where heritage can be conserved and balanced with the needs of production, community growth, environmental protection and public safety.

Mining on the frontier: some comparisons in the working of precious metals at the extremities of English / British rule

Peter Claughton
Exeter University, UK.

Carlisle in the 12th century or Ophir in the 19th; there were certain similarities in the way that the working of precious metals, silver or gold, was regulated. Significant differences are also apparent, particularly in the way the English Crown chose to react to the discovery of rich metal deposits which could be worked by the small operator. Well-established English practice was apparently ignored in Australia although it had given good service in a similar situation, albeit seven centuries earlier, and continued to be used in modified form up to the present day.

From Blow to go - a geological take on the early days of Mt Lyell

Keith Corbett
Consultant Geologist, Hobart

The early development at Mt Lyell in the 1880s and early 1890s centred around a large outcrop of gossan-like hematite ironstone known as the Iron Blow. Sluicing of nearby creeks produced fine gold which appeared to come from the Blow, but the costly attempts to crush the hard, heavy barite-laced hematite and extract payable gold were a failure, and forced the sale of the works to a Melbourne group, from which followed its development as a highly successful copper mine. Geological studies indicate that the Iron Blow was actually a fossil gossan formed about 500 million years ago, when the original sulfide body was exposed and oxidised at surface, but not completely eroded away. This happened when the mass of softened clay-rich rock, or schist, surrounding the orebodies, collapsed off the scarp of the great fault which cuts the field, and rolled out onto the younger conglomerates accumulating on the downthrown side. The huge slug of schist at North Lyell, surrounded by conglomerate and containing the rich bornite orebodies from the top of the system – the basis for the rival North Lyell Company's short-lived wealth - was also formed at this time.

A younger 'normal' gossan which had formed on the eroded upturned end of the sulfide body now lying beside the Iron Blow – but originally underneath it – also yielded good gold for a short period. The 250m deep sulfide body, consisting of massive pyrite and chalcopyrite, became the mainstay of the new Mt Lyell Mining and Railway Company, but it was the discovery of an amazing bonanza of silver-rich ore just beneath the Iron Blow hematite which got the company to its feet in the first critical years. This bonanza probably resulted from weathering and supergene enrichment processes acting on the upper part of the original sulfide body, which might well have been mostly lead-zinc sulfide, during this early interval of surface exposure and oxidation of the orebody.

Mining in Western Tasmania - A Brief History of Exploration and Development

Greg Dickens
Mineral Resources Tasmania

Exploration to this mineral-rich region of Tasmania began in 1856, with the discovery of a quartz vein near Mount Arrowsmith, by government surveyor James Calder. 150 years later, mineral discoveries are still being made, leading to the establishment of new mines such as the Avebury Nickel Mine near Zeehan. Exploration carried out over the past 50 years has not only supported existing mining operations but has contributed to the successful reopening of some abandoned mines. The continued development of Western Tasmania's mining fields presently generates around 80 per cent of the state's mineral wealth. This paper, not only briefly traces the history of the major mining fields and its supporting communities, but provides a background story for the Conference.

Pugholes and Brickworks of Adelaide's Western Suburbs

Greg Drew
Primary Industries and Resources SA

Due to the absence of timber suitable for building purposes, brick making commenced in SA soon after the establishment of the colony in 1836. Hand-moulded primitive bricks were first made using red alluvial clay from the banks of the River Torrens through the parklands. After the banning of this activity in 1840, brickmaking moved to the low-lying area west of Adelaide including Brompton, Torrensville and Beverley, which became the major brickmaking region of South Australia. For more than 100 years the history of the Brompton, Torrensville and Beverley areas was the story of pugholes – digging them out and filling them in.

This area is underlain by red alluvial clay which is up to 100 metres thick and ideal for brickmaking. The clay was worked by hand from pits or pugholes to natural water level that averaged about eight metres in depth. Clay was shovelled into trucks and hauled up incline railways to the adjacent brickmaking plants. Brickmaking in the area began as a backyard industry and it was not until the early 1900s that the larger clay workings were developed. The industry was at its peak in the 1920s when about 30 individual brickworks contained four large Hoffmann kilns and up to 100 smaller kilns, and employed 100s of workers.

By the 1960s, the traditional clay sources in the western suburbs were nearing exhaustion. This combined with the pressure from urban development and the preference for lighter coloured bricks, forced producers to develop new plants on clay deposits at Golden Grove. The last pughole closed in the late 1970s and most were subsequently filled with building and industrial waste and used for sporting activities or light industy. More recently, urban renewal projects have seen some contaminated sites excavated and refilled for housing. All that remains of a once significant brick manufacturing industry is the Hoffmann kiln in the Brickworks complex and four small kilns at Beverly. It is hoped that these kilns can be used to tell the story of the district's first manufacturing industry.

"Not for Want of trying": The history of the Coopers Creek Copper Mine, Victoria

Jim Enever

The first significant discovery of copper ore in Victoria was made during 1864 at the junction of Coopers Creek with the Thomson River near Walhalla in North Central Gippsland. During the years from 1866 to 1880, two main companies and a number of tributers attempted to make a go of what turned out to be a small but rich copper deposit located in rugged terrain on the southern flank of the Australian Alps. The driving force was provided by a number of local mining promoters, versed in the art of quartz mining for gold, but not base metal mining and smelting, for which there was no real precedent in Victoria at that time.

A feature of these years was the stream of imported managers engaged to provide the technical know how needed. Many of these came with a background honed by their involvement with copper mining in South Australia. Their attempts to translate experiences gained in more established mining centers to the isolated and testing environment of Coopers Creek generally proved disappointing. The story of Coopers Creek in the 1860s and 1870s is dominated by the struggle to introduce smelting based on the use of local timber as fuel, timber that was invariably wet, and the high cost of transport for materials coming in and product going out. Although modest operating profits were made over limited periods, none of the operators was able to claim a viable enterprise when repayment of capital was taken into account.

Getting lost in the Myths: Blue Tier mining history at risk

Jo Field
Environmental Officer

The significance of the Blue Tier in Tasmania's northeast is its rich tin mining history, dating from 1873. By 1878 the township of Blue Tier junction had three hotels, shops, stores and a small cluster of cottages. While the main period of tin production in the Blue Tier was between 1875 and 1913 prospecting has continued until recently. The Blue Tier is littered with the physical remains of the mining era, from large open cut faces to mining machinery, and even remains of prospectors' picks. Although mining and prospecting has had a very large effect on the landscape of the Blue Tier plateau, certain mining exploration marks have become the centre of a controversy.

Over the last 90 years reported observations of surface markings on tin granite boulders, at numerous locations on the plateau, have raised speculation to their origin. Some researchers have attributed the markings to Tasmanian Aborigines. An early investigation to determine these markings' identity by a multidisciplinary team in 1957 concluded they were a combination of natural weathering processes and mining exploration sampling. Another investigation in 2007 claimed the markings were examples of Tasmanian Aboriginal rock art, dating back 1,000 years. We have re-examined the evidence from earlier investigations and undertaken additional research in order to clarify the origin of these intriguing markings and to clarify for what purpose (if any) they were made. The results of these investigations are presented. The resolution of this issue is of great relevance to the correct historical interpretation of this iconic area.

Convicts and Salt Water River Coalmine Research Project

Wendy Fowler

Initially the Coal Mines Research Project began with the hypothesis that there must have been a high level of skills amongst the original convicts and their military supervision at the Salt Water River site, Tasmania. A careful examination of convict records and technical reports indicated that this was not the case. Further it is clear that the decision makers within the colonial government had several agendas.
The author's research compares the skill level of the convict miner workers with the general convict population and explores dependence upon a small number of key operatives in Tasmania's first mining operation. The research focuses on the period 1833 to 1847, at which time the mine was leased to a private operator. In particular focus will be on the men who worked the coal seam rather than the technical details of the mine engineering.

"A carter, a businessman, and a prospector with several things in common"

Philip Hart
University of Waikato

In the 1880s, Alexander Jackson was a carter and William La Grenade Mitchell was a businessman with a variety of ways of making money. In the twentieth century, Edward Ralph Martin was a 'professor' of music and an enthusiastic prospector for gold and oil in several areas of New Zealand. All three men had a slight involvement in gold mining in the Te Aroha district, but as well had three other, surprising, features in common, as this paper will explain.

Sons of Gwalia gold mine: reasons for operational longevity

Richard G. Hartley

The Sons of Gwalia gold mine near Leonora was the biggest gold producer in the state outside Kalgoorlie and was also the longest operational mine (1898-1963). It was British owned and managed but its management by Bewick Moreing, a company which in the early 1900s was one of the most powerful organisations on the Western Australian goldfields in its later years was somewhat of an anachronism. The paper argues that the mine's long term operation from as early as 1912 was largely dependant on local innovations and Government assistance rather than British capital and international technology. The company at the peak of its influence in 1904 managed nearly twenty mines. This was in contrast to the majority of British companies in the state, which were almost all single mine companies, a factor which adversely affected management mobility. Bewick Moreing's three main northern mines – the Sons of Gwalia, Great Fingall Consolidated and Yuanmi GM - had a common scarcity of fresh water and fuel, which encouraged the search for alternative power sources. Shortages of processing chemicals during the First World War also stimulated innovations in gold precipitation techniques. Consequently these isolated mines became world leaders in producer gas power generation and gold processing and during the downturn in mining during the 1920s as the industry steadily shrank the Sons of Gwalia, the last of the three mines was able to attract government finance for much needed development work.

Chasing a shadow? T.B. Moore, Robert Sticht and the Balfour copper boom

Nic Haygarth
Research Associate, University of Tasmania

TB Moore, the prospector who was outpegged at the Mount Lyell Iron Blow, wins the prize for Tasmanian mining lore's greatest 'one-that-got-away' story. He gained nothing from Australia's last colonial mining bonanza, the Mount Lyell copper boom. Moore's post-Iron Blow career was not spent in the boardroom or the boudoir, but 'on the wallaby' in bush camps. For the last 15 years of his life he was a waged employee, effectively of the Mount Lyell Mining Company, whose birthright apparently once lay at his feet. The focus of this work from 1907 to 1911 was prospecting and mining in the 1,000 square kilometres of coastal plains and ranges which came to be known as the Mount Balfour mining field. The interest of Mount Lyell general manager Robert Sticht and a Melbourne land grab sparked a Balfour copper speculation boom of more than 300 mining leases, most of them still virginal today. Sticht's fortunes were perhaps just as ironic as Moore's. One of the architects of Tasmania's greatest mining boom also directed its greatest fizzer, squandering much of his own wealth in the process.

Bulli and Appin Mine Disasters – Who was to Blame?

Adrian Hutton

The Bulli seam was one of the first seams mined in New South Wales and continues to be mined today. The seam has a long history of gas outbursts and explosions with two notable accidents being on 25 March 1887 in Bulli mine when 85 men were killed by an explosion and the other, a massive fire 31 July 1902 which killed 96 miners, some of them boys, in the Mt Kembla mine, only 20 kilometres south of the Bulli mine fire. Although less catastrophic with respect to fatalities, two other significant mine accidents occurred at Bulli Colliery in 1965 and Appin Colliery in 1979. Both these so-called accidents were followed by judicial inquiries.

The fire at Bulli Colliery on 9 November 1965 resulted in the death of four of the 11-man crew near where the fire occurred. Two subsequent inquiries disagreed as to the cause of the accidents. On 24 July 1979 fourteen men were killed when a large explosion hit the underground workings in the Appin Colliery. The inquiry following the disaster was critical of Appin mine operations, the performance of some mine employers and officers of the Department of Mines at the inquiry. This paper will look at the published information following the Bulli and Appin accidents, especially the causes and the consequences that followed.

"That some rich lode amongst these hills is waiting for us yet"

Tim Jetson
Education Faculty University of Tasmania, Hobart

This paper outlines the development of mining at the Barn Bluff and Pelion mining fields, located in what is now the Cradle Mt-Lake St Clair National Park. Phases of mining, from the early 1890s until the end of World War II, are delineated and analysed. Reasons for the demise of the fields, including the area becoming a Scenic Reserve, are suggested. Key figures, such as prospectors, mine managers, speculators and politicians, associated with the mines are identified and details of mining operations are provided. Finally tentative conclusions are drawn about mining's environmental impact and its significance in the history of the National Park.

New Zealanders and the Zeehan Silverfield 1891-1895

Roger Kellaway
School of Geography and Environmental Studies, University of Tasmania, Hobart.

In 1891, 1,222 persons arrived in Tasmania direct from New Zealand. This was more than three times the annual average of the preceding decade. In 1892, departures to New Zealand were equally abnormal. The most obvious explanation for this unusual pattern involved the activities of T.A. Reynolds and Company. Loosely associated with the Union Steam Ship Company, Reynolds and Co. had the contact to build the Strahan to Zeehan Railway. Unable to secure sufficient workers locally, they recruited large numbers of labourers in Dunedin. The completion of the railway, the difficult natural environment and the temporary collapse of the silver boom following the failure of the Bank of Van Diemen's Land saw many of the navvies return to New Zealand on the expiry of their contract.

The railway project by itself cannot explain the large number of New Zealanders coming to Tasmania in the early 1890s. The Zeehan silverfield offered other attractions, especially for residents of declining mining regions in New Zealand. Miners, mine managers, share brokers, storekeepers and others left stagnant townships throughout Central Otago and the Thames to seek their fortune on Tasmania's West Coast. This study examines the importance of Zeehan as a magnet for New Zealanders by measuring its impact on the scale of inter-colonial migration. The paper also considers the information flows in the New Zealand press that provided the stimulus for emigration despite the majority of reports being negative. Some attention will be placed on the wider significance of the influx of a skilled mining population into a largely non-mining colony.

Recap Mines and Tramway on the Chillagoe Field - its connection to southern Australia and Queensland politicians 1890 to 1920s

Ruth Kerr, OAM.
Department of Natural Resources and Water, Queensland

Redcap mines and tramway are significant for their critical role in the development of the Chillagoe field and as a precursor to the formation of the Chillagoe Company Pty Ltd and construction of the Chillagoe smelters. The mines were opened in 1890 and a battle with influential southern mining directors was fought in the local court over ownership, and the tramway was built in 1901 with steel rails, which were rare in Queensland. The resources and the tramway also figured in the Mungana Scandal in the 1920s and tramway rails were used as uprights in the Palace Hotel in Cairns.

Weather versus Glen Davis

Leonie Knapman

When settlers arrived in Sydney over 200 years ago they did what man had done down through the ages and that was to build along river flats, and so it was when Glen Davis was built along the Capertee River in 1938. *Floods, what floods* was the question as residents arrived to build a new industry and township along the river that had had no water in it for years. Glen Davis had a temperate climate, but the Australian weather can often be unkind but also bounteous. This paper will cover the 14 years of problems that beset Davis from droughts and lack of water to the 29 floods that destroyed homes and damaged the work site many times.

Booms, busts and the environment: the life and times of the base metal mining community of Captains Flat

Barry McGowan
Australian National University

Captains Flat is located in the southern tablelands NSW about 40 minutes south of Canberra.
Its environment and circumstances have many similarities with Queenstown. Gold was found along the Molonglo River and worked for many years on a small scale. In the early 1880s reef gold was found in the hilly country upstream, now the site of Captains Flat. By 1885 the gold bearing ore was found to have a very high silver content. For the next 6 years the Flat was a silver producer, until low silver prices and inappropriate treatment methods led to the closure of the mines, and a focus on copper extraction. Higher copper prices in the mid-1890s encouraged large-scale capital investment based on the pyritic smelting process as at Queenstown. Falling copper prices lead to the closure of the works in the late 1890s.

Captains Flat lay dormant until the mid-1930s, when rising metal prices and the availability of the flotation process encouraged large scale investment. Lead was one of the main products. Throughout the 40s and 50s the town again enjoyed boom conditions, until falling reserves caused the closure of the mines in 1962. Captains Flat survives today as a feeder town for Queanbeyan and Canberra. Locally it is most remembered for its environmental legacy. Defoliation and deforestation in the 1880s and 1890s were bad enough but in the 1940s the slime dams collapsed into the Molonglo River, leading to wholesale destruction of arable farm land. Reclamation and rehabilitation work is ongoing.

Quidong Mineral Field, NSW: An intriguing discovery of W.B. Clarke

Ken McQueen
University of Canberra

In 1851-1852 the Reverend W.B. Clarke, Australia's first geologist, discovered copper at Quidong in the Bombala area of southern New South Wales. larke focussed on gold and at panned colours of the metal from detritus trapped in cavities in a limestone outcrop on the edge of the Delegate River at Quidong. Observing nearby veins of copper carbonates he predicted a major mineral field would develop in the vicinity and in 1864 the Quedong Copper Mining Company commenced operations. It produced several hundred tons of copper ore but expended all its capital before a profitable mine could be established.
n 1868 the Belmore Freehold Silver and Lead Mining Company took over the Quidong deposits and purchase an additional 100 acres it considered prospective for lead and silver. Crushing equipment and a smelter were erected but there is no record of production and the site was abandoned by the early 1870s.

The area continued to attract interest and in 1955-56 Lake George Mines Pty Ltd. investigated the Quidong Basin for base metal deposits but major problems were encountered in drilling the cavernous and fractured ground. During 1969-1970 Cyprus Mines Corporation in joint venture with Hastings Exploration N.L. and Esso Australia Ltd explored the basin using improved techniques but, despite encouraging signs, no economic mineralisation was discovered. From 1978 to 1983 Western Mining discovered ore-grade intersections at Clarke's Reef but without sufficient continuity. Further exploration by Plagolmin Pty Ltd and Delta Gold NL from 1987 to 1995 revealed zones of gold mineralisation but with no resulting mine. A new company, Stirling Minerals Ltd, has recently taken over the tenements and completed a detailed airborne magnetic and radiometric survey to identify possible drilling targets. After 156 years the jury is still out on Clarke's prediction.

History of the Discovery of Gold and Iron Ore and the development of the magnetite deposits at Savage River, NW Tasmania, from 1877 through to the 21st Century.

Donald J. Perkin

In 1877 Government surveyor and geologist Charles Sprent became the first European to discover the huge magnetite deposits that were cut by the Savage River in this remote part of Western Tasmania. In this expedition Sprent also discovered alluvial and lode gold and other minerals. In the following 30 years further exploration was undertaken by other hardy government geological surveyors across the highly mineralised area known as the Pieman River Goldfield. This opened up the country for prospectors and developers and led to the publication of the Iron Ore Deposits of Tasmania in 1919.

During the Depression of the 1930s only some desultory gold prospecting was noted in the Pieman River goldfield and Savage River area although a Government report (Finucane, 1933) detailed new insights into the geology of the area. However it also suggested that that most of the alluvial gold at Savage River had already been worked out and that there was little to be gained in enduring the rigours of further prospecting in this remote locality. In the late 1930s it was estimated that the iron ore resources of the Savage River area totalled over 20 million tonnes of potentially high-grade ore (Rio Tinto), but that this would still be uneconomic because of its remoteness and other reasons.

The post-war period from 1948 to 1960, saw demand and prices for commodities rise strongly in concert with technological advances for discovering and exploiting minerals. Federal and State Government aid including subsidised exploration drilling, and the development of a robust tenure system for mining title propelled the economy into five or six successive economic booms. The Savage River iron ore project is a reasonably good paradigm, which exemplifies the first of these booms. This development saw a coming-together of Australian entrepreneurs and overseas management, which with government cooperation led to the successful exploitation of low-grade ores. The above aspects of the burgeoning Savage River Project that was begun in 1964/1965 are just some of the subjects that will be touched upon and illustrated in this paper.

Tragedy at the Mt Lyell Mine, 1912

Peter Schulze JP

Fellow: Institution of Engineers Australia and of the Institute of Mining and Metallurgy.

The Mount Lyell Copper Mine at Queenstown in Tasmania has been operating since the 1880s. The most tragic event in its history occurred on Sat 12th Oct 1912. At 8.00am, 170 men went down into the North Lyell Mine. At 11am a fire stared at the 700m pump station. About 78 men were able to get out that day before the smoke intensified. Early Sunday morning 92 men were not accounted for. Attempts were made to rescue them on Sunday, Monday and Tuesday. On the Wednesday, after 109 hours underground, and most of that time without food, 54 were rescued. The total number of lives lost was 42 - more than at Port Arthur in 1996. Twenty widows and 35 orphans were left as a result of the disaster. There are many stories of great sadness, many tales of great courage and many great acts of bravery associated with the tragedy. There were also many lessons learnt about mine safety. A Royal Commission was established and the Company brought five 'expert witnesses from 'away'. Much of their evidence was faulty, yet given high regard by the Commission. On the other hand, evidence given by experienced Company employees was generally discredited. My assessment of the Royal Commission transcripts (recently typed up and published) conclude that the Commission's findings were faulty and that the most likely cause of the fire was from an electrical fault.

Millie's Story: Women, Domesticity and Commerce in Gwalia and Leonora

Pam Sharp
History & Classics, University of Tasmania

This paper draws on evidence (mainly oral history) collected for our ARC Linkage Project (Bertola, Fitzgerald, Layman, Sharpe) about the history of the mining communities of Leonora and Gwalia. By focusing on one woman (Milka Rodonovich born in Dalmatia in 1891) we can take a detailed look at women's employment and social and economic position in a remote mining town in Western Australia. Millie's story includes her emigration; her work running boarding houses and sly grog operations; the laundry trade and provision of food as well as economic aspects of family and household management. We also learn about religion, educational, social life and race relations through the story of this and similar families who lived in these remote communities.

Mining Lower Grade Ore through changes in Mining Technology at the Mount Lyell Mining and Railway Company, Queenstown, Tasmania from 1931 to 1938

Tony Weston

The Mount Lyell mining and smelting operation at Queenstown in Tasmania was established in the early twentieth century. It was based on a high grade copper resource, following earlier separate mining developments, and mainly used underground mining. The development of a larger low grade resource in the period 1931 to 1938 was primarily driven by changes to the underground mining technologies employed, followed by large scale open pit mining. The topography at Mount Lyell had allowed the prior development of a 100,000 tons per year low level rail haulage tunnel capable of expansion to much higher capacity. This was at the time when a low-grade pyrite hosted copper resource was being recognised as an alternative ore resource through the application of new, lower cost underground mining technologies. The new underground mining technologies were however unable to produce copper from the low-grade resource at an acceptable cost, and open cut mining was initially developed with a variety of small scale excavation, loading and transport methods. Larger scale drilling and blasting, shovel loading and truck haulage to an ore pass were subsequently used, accompanied by rapidly decreasing mining unit costs. By 1938 Mount Lyell had the highest annual ore production of any mine in Australia, producing more than a million tons of ore each year.

FINE or FORGED: Precious Metal Assay through the Ages

Nicola Williams
Monash University

The purity, or fineness, of a specimen of precious metal has been important ever since coinage was invented near the end of the seventh century BC when forgers saw a golden opportunity for quick profits. Miners, jewellers, mints and banks have been concerned with fineness ever since, and various assay methods have been developed. While some modern spectroscopic techniques are becoming important, the ancient method of fire assay remains the most accurate, and is still the standard for comparison. This paper describes and compares assay methods, particularly in relation to gold and silver, and the role of accurate weighing in fire assay.

TOURS

Mount Bischoff Mine

Saturday October 4, 2.00-3.30 pm

2008 marked the reopening of the Mount Bischoff Mine for the first time in more than 60 years. Operated by Bluestone Mines Tasmania Pty Ltd, ore is extracted from an open-cut and transported by road to the Company's mill at the Renison Tin Mine.

James 'Philosopher' Smith found tin at Mount Bischoff in December 1871. Mining started 12 months later, before the formation of the Mount Bischoff Mining Company, in 1873. In the seventy years that followed, the company produced almost 57,000 tonnes of tin metal from 5.6 million tonnes of treated ore. It paid dividends of $5.1 million on paid up capital of $59,200. The present day value of the tin produce is about $800 million. In 1874, the company erected its own tin smelter in Launceston, which operated until 1929, when it shut down due to the Depression.

By the end of the first decade, the community of Warratah had a population of 1,500 and increasing steadily while a new railway was operating between the mine and port at Emu Bay (Burnie), having replaced a wooden tramway built in 1878. However, 1907 marked the mine's decline, with only low grades being extracted from the main orebody. To improve efficiency, a new mill was commissioned in 1910 to process high tonnages of low-grade ore.

Unfortunately, with increasing production costs, low tin prices, and the onset of a world-wide depression, the Company decided to cease mining in 1929. The mine was then worked by tributors until 1942, when the Mount Bischoff Company's assets were sold to the Commonwealth Government. The mine was finally shut down in 1947. In its heyday, the Mount Bischoff tin mine was one of the largest in the world, and for many years, the cornerstone of Tasmania's mining industry.

Rosebery

Saturday October 4, 3.30-5.00 pm

Following the 1890 discovery of the Mt Read lead-zinc deposits by Alfred Conliffe, was the discovery and development of the Rosebery Mine. Setting off from Mt Read, prospector Tom McDonald headed in a northerly direction while carefully exploring the creeks leading into the Pieman River along the way. On 13 November 1893, he found gold in alluvial wash and boulders of zinc-lead ore in Rosebery Creek which was located on the south western slopes of Mt Black. Further prospecting was carried out by McDonald for the Rosebery Prospecting Association which eventually located a zinc-lead sulphide ore-body near the site of the present Rosebery Mine.

Cecil Thomas (Tom) McDonald, who was first cousin to the McDonough brothers of Mt Lyell fame, had a similar background to James "Philosopher" Smith. Like Smith, he was a farmer turned prospector from the Northwest Coast, who continued to maintain his passion for mineral exploration for the remainder of his life. He died in 1938 at the age of 82 without achieving the reward or recognition he deserved.

By 1896, the area was mainly under the control of the Tasmanian Copper Company and the Primrose Mining Company. However, the zinc-lead sulphides presented metallurgical problems which resulted in the closure of the mining field during 1900. After resuming in 1905, the Companies began transporting their ore to the Zeehan Smelters. The Emu Bay Railway continued to carry Rosebery ore until the closure of the smelters in October 1913.

The Rosebery mines were purchased and reopened by the Electrolytic Zinc Company of Australasia Limited in 1920. The old Zeehan Smelters were also purchased and refurbished to process the

complex ores from Rosebery and Mt Read mines. The furnaces were used to roast the ore to produce calcines which were then sent to the Port Pirie Smelter. The Zeehan Smelter continued production until its closure in July 1948, when operations transferred to the Company's Risdon plant at Hobart.

Meanwhile, construction of a concentrating mill was commenced at Rosebery but not completed until 1929. The mill used the selective flotation process to produce the zinc concentrate before transportation to the Risdon Smelter. Prior to the discovery of the extraction process, zinc had been regarded as a waste product. In 1988, the Rosebery Mine and Emu Bay Railway began trading as Pasminco Mining while the Risdon Smelter was listed under Pasminco Metals. Both were divisions of Pasminco Limited.

For the past 112 years, the Mine has produced copper, gold, lead, zinc and silver from 22 million tonnes of ore. Since 2000, the average annual ore production from the Rosebery Mine has exceeded 750,000 tonnes. Trading as Zinifex Limited, official company production figures for 2006-7, recorded almost 83,000 tonnes of zinc in concentrate and over 23,000 tonnes of lead in concentrate. With an estimated metal value of more than $8 billion, it has produced more wealth than any other mine on Tasmania's West Coast.

The town of Rosebery, which sprang up adjacent to the mine, was described in 1898 as a bush camp with a corded main street. Since the takeover by the EZ Company in 1920, Rosebery has emerged as the commercial centre for the region. By the end of 1957, the Company had erected 314 dwellings for its employees which later increased to 591 by 1985.

In 1981, the town's population peaked close to 2,700 while providing a mine workforce of 1,150. Since then, employment has been reduced as a result of technology and workplace efficiencies. Having celebrated its centenary in 1994, Rosebery has survived as the second largest community in Western Tasmania. In April 2004, as a result of a company restructure and a consolidation of assets, Pasminco Limited experienced a name change and now operates as Zinifex Limited. The company retained its Hobart Smelter and continued to operate its West Coast property as the Zinifex Rosebery Mine. The restructure at Zinifex Limited continued, when the Company sold their Hobart property in late 2007. The smelter now operates under the name of Nyrstar Hobart.

Mt Lyell Mine

Monday October 6, 3.30-6.00 pm

It was the glint of gold that lured fortune seekers to the Queen and Linda Valleys. The development of the Iron Blow as a gold mine was the focal point of activity in the Linda Valley. Government geologists Gustav Thureau (1886) and Alexander Montgomery (1890) had both compiled reports which targeted the mineralisation of ground in close proximity to the Iron Blow. Acting on Montgomery's report were syndicate members, Bowes Kelly and William Orr who visited the locality in 1890. Kelly inspected the "Blow" where samples of ore were collected and sent to the Broken Hill smelters for analysis.

The assay results indicated sufficient quantities of copper in pyrite for large scale mining with significant values of gold and silver as by-products. The Kelly-led syndicate formed the Mt Lyell Mining Co; No Liability, which in 1893, became the Mt Lyell Mining and Railway Company Limited. For the first time, Tasmania had a profitable copper mine. The new company decided to construct a smelter and a railway link to the coast. Robert Sticht was brought from the United States to design, erect and manage the new smelter. Upon his arrival in 1895, he proposed that the ore be treated by pyritic smelting, the sulphur and iron in the ore being used as fuel, instead of the roasting process. The smelter commenced operation in 1896.

Construction of the 3 feet 6 inch (107 cm) Mt Lyell Railway commenced in December 1894. The first section of 23 kilometres to the port of Teepookana, on the King River, was completed inside two years. This section included grades of 1 in 20 where the unique rack (abt) system was used. The remaining twelve kilometres to Regatta Point, on Macquarie Harbour, was completed in time for a planned official opening on 1 November 1899.

James Crotty, who had been a part owner of the "Iron Blow" gold mine and an original shareholder of the Mount Lyell Mining and Railway Company, was excluded from the Board of Directors by its chairman, Bowes Kelly. In retaliation, Crotty embarked on a vendetta against Kelly by raising the appropriate capital to fund a company in opposition. As a result, the North Lyell Copper Company was established in 1897. Located adjacent to the "Iron Blow", the North Lyell Mine contained deposits of high grade copper ore which were considerably richer in copper content. The Mine became the scene of the infamous 1912 Disaster which claimed the lives of 42 men.

To keep abreast with the opposition, the North Lyell Company constructed its own smelter, railway and port facilities. Between November 1898 and September 1900, a 45 kilometre railway was built to link the Linda Valley with the Macquarie Harbour port of Pillinger (Kelly Basin), while nineteen kilometres down the line from Linda Station, was the Crotty township and smelting plant which was completed in 1902.

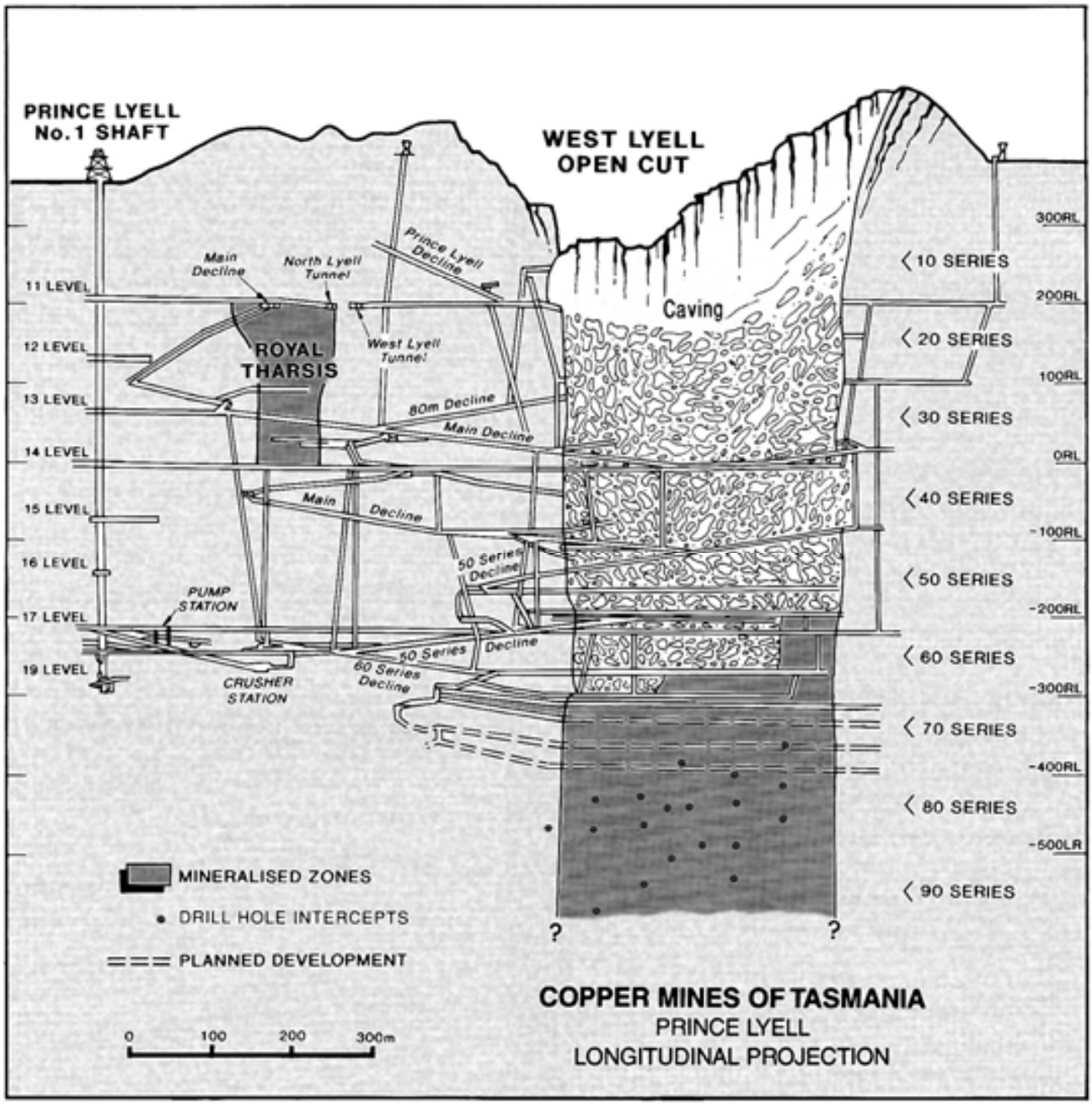
By the end of 1902, both companies were experiencing serious problems and fighting for survival. North Lyell's high grade ore reserves had been offset by an inefficient smelter and the accumulation of debt through mis-management whereas Mt Lyell had lower grade ore but a superior management and workforce. Ironically, the two rival companies were forced to consider amalgamation. An agreement was eventually signed in May 1903 which ended a six year feud. The merger precipitated the immediate closure of the Crotty smelter and the eventual demise of the North Lyell Railway during 1929.

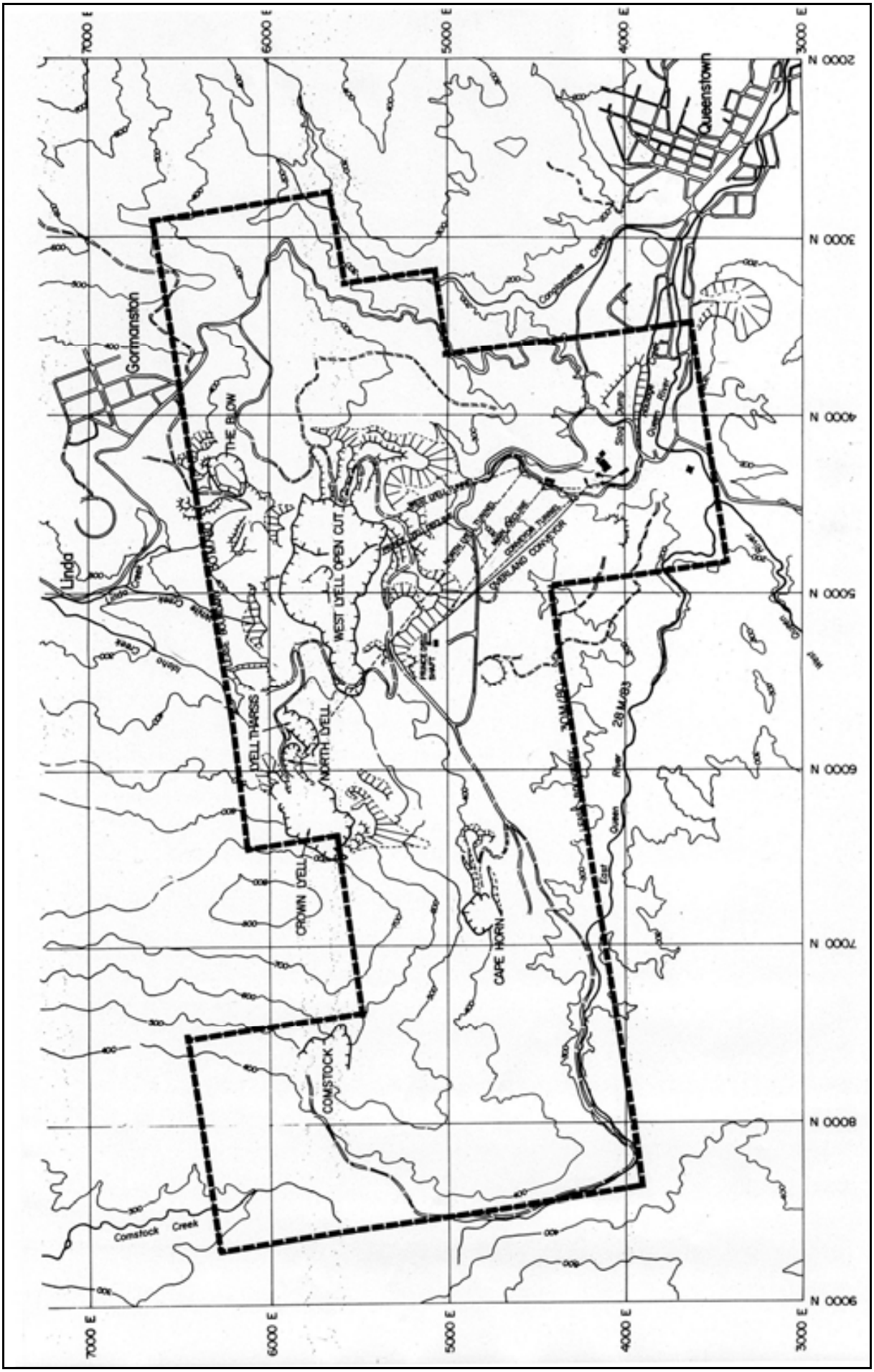
The Mount Lyell Mining and Railway Company retained its name and continued to operate until its closure in December 1994. During its 101 years of continuous operation, the Company's total production was estimated at 110 million tonnes of ore. During its working life, the mine operated as a surface and underground facility. The main productive orebodies included the Iron Blow (1883-1929), North Lyell (1896-1972), Royal Tharsis (1902-91), Lyell Comstock (1913-59), Crown Lyell (1931-85), Cape Horn (1969-87). By far the most productive was the gigantic West Lyell Open Cut, which yielded more than 58 million tonnes of ore from 1934 to 1978. Current production is maintained from the Prince Lyell underground mine, which commenced operation in 1969.

Meanwhile, Copper Mines of Tasmania (CMT), a subsidiary of Perth-based Gold Mines of Australia Limited, signed an agreement with the Tasmanian Government on 28th June 1994, to take over the Mt Lyell leases after the mine closed. The agreement also included the purchase of existing equipment an infrastructure. After an investment by CMT of $55 million to upgrade the mine, Mt Lyell was officially reopened in December 1995. Initial production commenced at 2 million tonnes per year, with the first shipment of 10,000 tonnes of copper concentrate exported during March 1996.

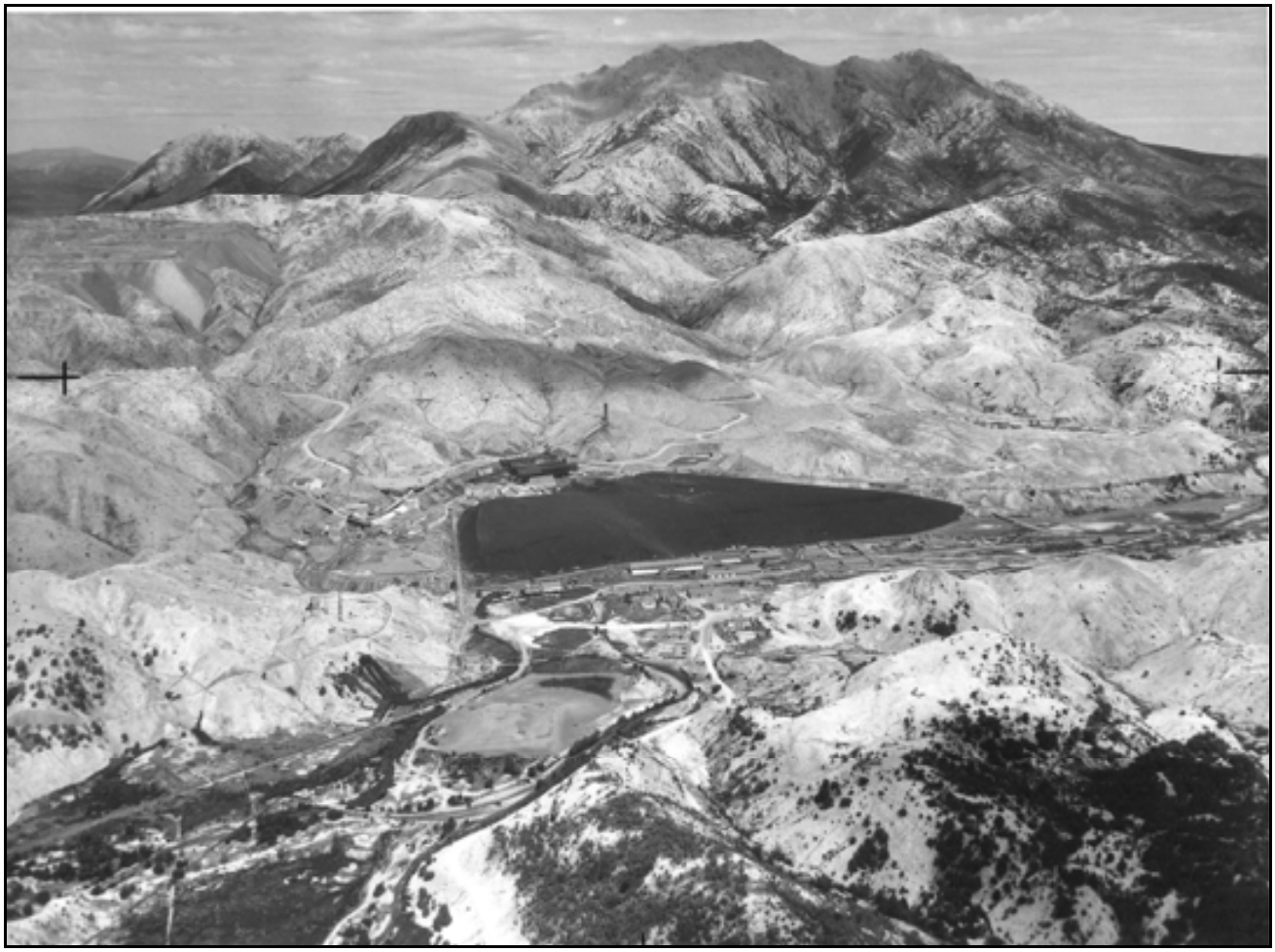
Annual production steadily increased to a peak of 2.7 million tonnes during the financial year 2001-02, while production of copper concentrates exceeded 30,000 tonnes during the two-year period 2001-02 to 2002-03. Annual production is expected to exceed 3 million tonnes in 2008.

During the twelve years since the 1995 reopening, more than 28 million tonnes of ore has been mined, which has yielded over 300,000 tonnes of copper and approximately 170,000 ounces of gold. Since the end of 1998, the Mt Lyell Mine has been owned by Sterlite, an Indian telecommunications cable company. The Mine now supplies copper concentrates exclusively to Sterlite's Tuticorin smelter in Southern India.





PLAN OF MT LYELL MINE

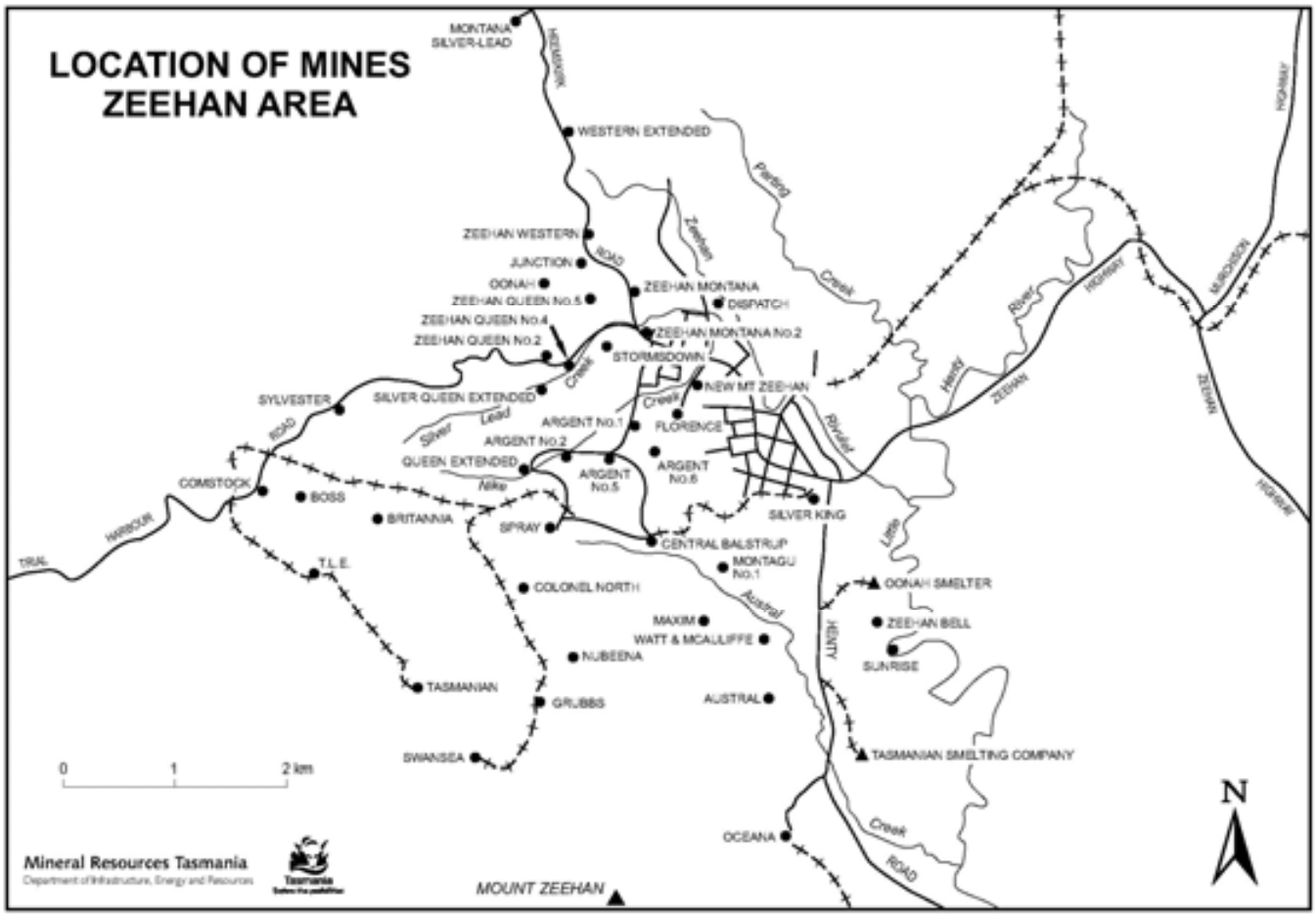


Mt Lyell Mine Works and slag dump, looking south-east towards Mt Owen, c.1960

Lyell Mine Works and slag dump, looking north-east towards Prince Lyell No.1 Shaft and summit of Mt Lyell beyond

Zeehan

Thursday October 9



December 1882 marked the discovery of silver-lead at Zeehan, close to where the impressive Post Office building stands today. Frank Long, who had an earlier association with the development of the nearby Heemskirk Tinfield (1876-1877), established an 80 acre reward section which he named the Mount Zeehan Mine. Ironically Long's reward claim was a failure, while many surrounding mines flourished.

The failure of the Heemskirk Tinfield had temporarily discouraged investment and effectively slowed down development in the Zeehan area. However, public interest in the mining field increased during 1887, when George Bell discovered the substantial Silver Queen galena lode. By 1891, there were 159 companies and syndicates operating around Zeehan. Dundas, which was located 10 kilometres east of Zeehan and with a population of more than 1,000, also became a prosperous mining field with 74 companies floated.

Government Geologist, Alexander Montgomery estimated the Zeehan-Dundas area had produced about 14,000 tonnes of silver-lead ore by March 1893. He named the Silver Queen, Western and Oceana at Zeehan along with Maestrie's at Dundas as the prominent mines. During the most successful period of 1893 to 1908, the value of production was estimated at £3.5 million, or about $175 million on present day valuation.

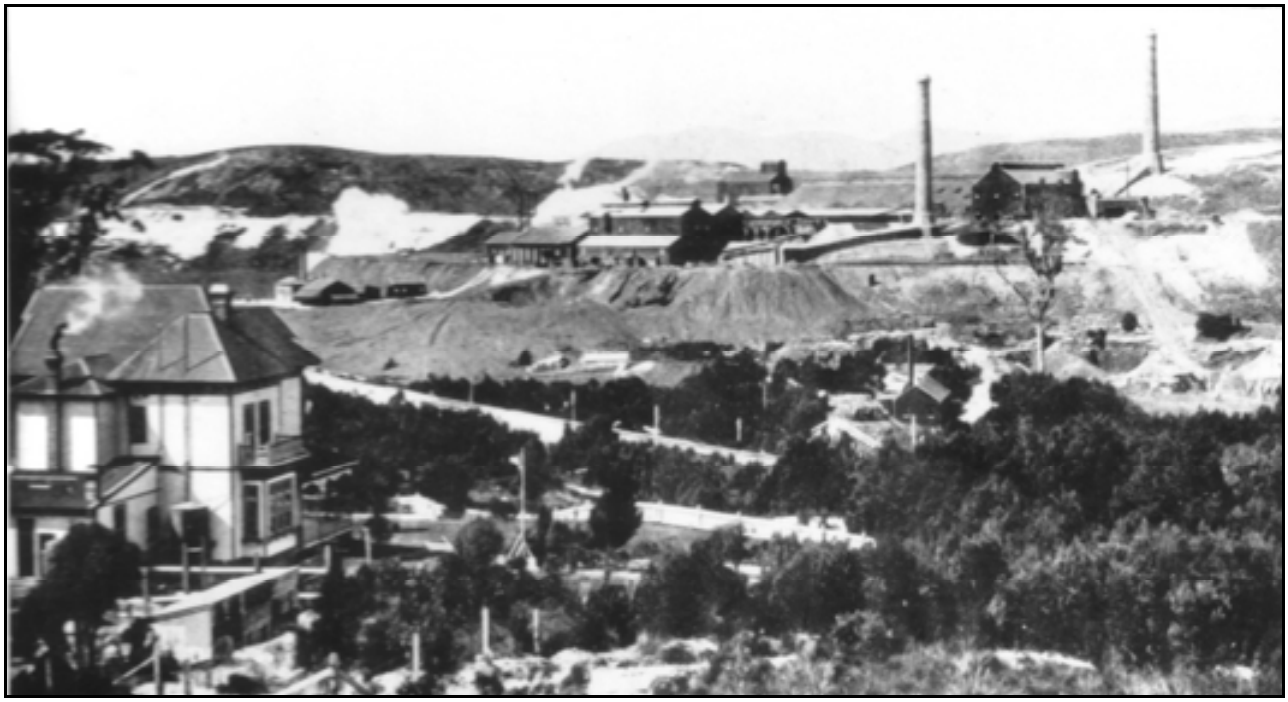
Zeehan reached its peak during 1907, when an estimated population of between 8,000 and 10,000, made it the third largest town and the busiest country rail centre in Tasmania. While supporting dozens of business enterprises which included about 20 hotels, the imposing Gaiety Theatre, the Zeehan and Dundas Herald newspaper, the Zeehan School of Mines and Metallurgy and the Austral Smelters, Zeehan became a typical "boom town". Dundas, being a much smaller community, did provide its inhabitants with the essentials of life which included some shops, pubs, a brewery and a rail connection with Zeehan. There is nothing remaining at Dundas today.

However, a rapid decline in mining occurred after 1911 when many of Zeehan's important mines began to run out of shallow ore. Furthermore, the outbreak of war in 1914 effectively destroyed their European markets, and with the closure of the smelters (1913), started the gradual demise of the town. By the time the last mine (Oceana) closed in 1960, Zeehan's population had dwindled to 600.

Following the redevelopment of the nearby Renison Tin Mine in 1965, Zeehan made a remarkable comeback. A new subdivision of workers' houses was built in the area once occupied by the rail-yards. A motel and a supermarket were also established to mark a new era of prosperity. By 1970, the population had increased to almost 2000. Although the town's fortunes have since ebbed and flowed with the fortunes of the Renison Mine, stability was restored in 2007 with the opening of the new Avebury Nickel Mine, about 7 miles to the west.

Once referred to as the "Silver City", it remains as Tasmania's best example of an authentic boom town. Glimpses of its former glory remain today with two original pubs, a bank, post office, council offices, the School of Mines building and the Gaiety Theatre. These are all monuments to the largest, and for twenty years, the most prosperous town to have existed on Tasmania's West Coast.

Main Street, Zeehan, looking east, 1911



Tasmanian Smelting Company's Works, near Zeehan, 1906

Site of Tasmanian Smelting Company's Works, near Zeehan, March 2004

Renison Bell

Thursday October 9, 2.00-3.30 pm

The establishment of Zeehan during the late 1880s provided a central West Coast base for miners and prospectors. The town was strategically located to all mineral fields between the Pieman River and Queenstown. Activity in the North Dundas area started in 1890, when George Bell found tin in a gossan outcrop during May, followed by a cassiterite discovery by Ringrose Nicholson a month later. Bell immediately pegged out four sections along the Argent River, each of 40 acres and later registered the Renison Bell Prospecting and Mining Company. Nicholson's claim was located on the Ring River, about a mile to the east.

George Renison Bell, whose name is perpetuated in the Renison Tin Mine, was an experienced prospector miner who had previously discovered several tin deposits in Northeast Tasmania during the mid 1870s. Following his North Dundas activities, Bell relocated to North Queensland during 1893 to manage the Tate River Tin Mine on the Atherton Tableland. He returned to Zeehan five years later in order to prepare an updated report for the Renison Bell Prospecting and Mining Company.
His favourable report enabled the Company to issue a prospectus to further develop the tin deposits.

Mining in the field struggled until 1907, when an enterprising Irish miner named Michael 'Paddy' O'Dea arrived on the scene and teamed up with a local mine operator named Ted Flight.
Between them, they were able to secure investment from Devonport businessmen to develop the extensive alluvial deposits. Within the first twelve months, the Boulder Tin Mining Company had erected a concentrating plant and stamper battery. The first two years of mining produced an encouraging profit of £10,000 at the Boulder Mine. By 1912, four other mining companies had returned to the field in the hope of similar success. In 1914, the Boulder and Dreadnought companies merged to form the Dreadnought-Boulder Tin Mining Company No Liability. However, the new company encountered problems with a reduced workforce due to wartime recruitment, while more lucrative wages and better working conditions at Zeehan and Queenstown had enticed some miners to work there.

The field was struggling by 1917, with many mines closing down or being worked on tribute.
Further problems occurred in 1920 with a depressed international tin price, followed by the destruction of the mill by bushfire during 1924. By 1928, the mine was experiencing poor recovery rates from low-grade sulphide ores. To ensure the viability of the mine, Paddy O'Dea set about amalgamating all adjacent mines and leases under one name. However, the Depression intervened and mining ceased between 1929 and 1933.

Following the Depression, a new company was floated in 1934 under the name of Renison Associated Tin Mines No Liability, with proven ore reserves of 500,000 tonnes. A treatment plant, which incorporated the newly developed sulphide flotation process, was commissioned by 1937. In 1958, after more than twenty years of marginal operation, the Renison Mine received an injection of capital from the Mount Lyell Mining and Railway Company which had become a major shareholder. A four-year mine development and exploration programme was financed in order to bring the mine back to a more profitable level. Ownership of the mine changed three times between 1963 and 1965, before finally emerging under the control of Consolidated Goldfields Limited (London), which changed the company's name to Renison Limited.

Consolidated Goldfields was responsible for the $10 million redevelopment which included the construction of a new ore treatment complex. The original Boulder Mill, established in 1907 and subsequently modified over the years, continued to operate until the end of 1966, when operations were transferred to the new site. Over the ensuing twenty years, the mine's surface infrastructure was progressively modified and upgraded to its completion in 1986.

The last major development at the mine was the completion of the $34 million Rendeep Project in 1996. During June, a new 600 metre shaft was commissioned to provide access to a 3 million tonne

ore body, a new electric shaft winder and a crushing station were installed underground, and a radial ore stacker was constructed outside the entrance to Number 1 Adit. The Rendeep Project was expected to keep the Renison Mine in production for at least another 10 years.

The mine was sold to Brisbane-based Murchison United in late 1998. This company immediately made major operational changes and restructured the workforce. Since 1999, the mine's operation had been seriously affected by increased operating costs, low tin prices, and employee retrenchments.
In addition, a $4.5 million support package was required from the Tasmanian Government to find new ore reserves. In May 2003, a rock fall occurred underground which resulted in a fatality and an immediate halt to mining.

Voluntary Administration followed a month later, and a $600,000 State Government secured loan was provided to keep the underground pumps operating, while the mine was put up for sale. Unable to secure a buyer, the Administrator decided to sell the surface assets. With all the saleable underground equipment removed, the pumps were finally turned off on the 5 January 2004. The mine was eventually purchased by Bluestone Tin Limited in March 2004. After a significant refurbishment of the mill, the mine was back in production the following November. Unfortunately, after only 12 months of operation, low tin prices had forced Renison to close down during November 2005 and be placed on care and maintenance. The Company intends to recommence mining in 2008.

During the period from 1965, Renison was regarded as the largest underground tin mine in the Southern Hemisphere where more than 2 million tonnes of ore were produced. At the same time, almost 10,000 people were employed which provided stability to the town of Zeehan.

Queenstown

Thursday October 9, 4.15-5.45 pm

The first settlement on the Lyell field was established around the developing "Iron Blow" gold mine. The first official post office was opened at Gormanston in 1884. The town continued to grow with the development of the North Lyell Mine where it became the residential area for its workforce. According to the 1901 census, Gormanston supported a population approaching 2,000. The town included four hotels and numerous shops and for a brief period, was serviced by a four kilometre branch from the main North Lyell railway line. After the amalgamation of the two companies, much of the town's business moved to Queenstown which made Gormanston principally a dormitory area for the North Lyell workforce.

The original site of Queenstown was located at the head of the Queen River valley and close to the smelters. Established in 1892, the town of Penghana was a shanty town of split paling huts and canvas tents. However, the Government was agitating for an alternative town site when on 12 December 1896, a bushfire razed most of the settlement, narrowly missing the smelters. By early 1897, a new town was taking shape in the area surrounding the railway station.

Queenstown reached its peak after the amalgamation of the Mt Lyell and North Lyell companies and by 1905, the population had exceeded 5,000. Unlike its northern neighbour, Zeehan, Queenstown has maintained a stable population throughout its 100 years existence. It has survived many periods of uncertainty to become the most important mining centre on the West Coast.

To visit the town today, the existence of the many impressive buildings are a reflection of prosperous days gone by. The sight of the surrounding bare hills and the massive slag dump are a tangible reminder of the first success at pyritic smelting in Australia. The last two decades has marked a significant increase in visitor numbers to Queenstown, resulting in the establishment of new motels and tourism ventures. Furthermore, the resurrection of the historic Queenstown to Strahan railway during the 1990s, has increased the tourist dollar to the town. This will help to secure the future of the town when the famous Mt Lyell Copper Mine is finally closed down.

AUSTRALIAN MINING HISTORY ASSOCIATION

The Australian Mining History Association Inc. acknowledges, with much gratitude,
The sponsorship and support provided by:

West Coast Council

Silver Hills Motel
Michael Purtell

West Coast Visitor Information & Booking Centre
Jo-Anne O'Brien

Vedanta, Copper Mines of Tasmania
Geoff Cordery

Workcover Tasmania

TAFE Tasmania

Mineral Resources Tasmania
Michael Dix

Joe Newett

Central Hotel, Zeehan
Gloria Redshaw

Queenstown Rotary Club

John & Geraldine Halton

Bischoff Hotel
Lew & Bev Rout

Hydro Tasmania

Bluestone Mines Tasmania Pty Ltd
Bill Burrow & Duncan Bennett

West Coast Heritage Limited
Keith Corbett
Ray Shea
Doug Hayden
Ray Keating

The AMHA 2008 Conference Organising Committee
Greg Dickens
Steve Newett
Nic Haygarth
Greg Drew
Mel Davies