



**AUSTRALASIAN  
MINING  
HISTORY  
ASSOCIATION**

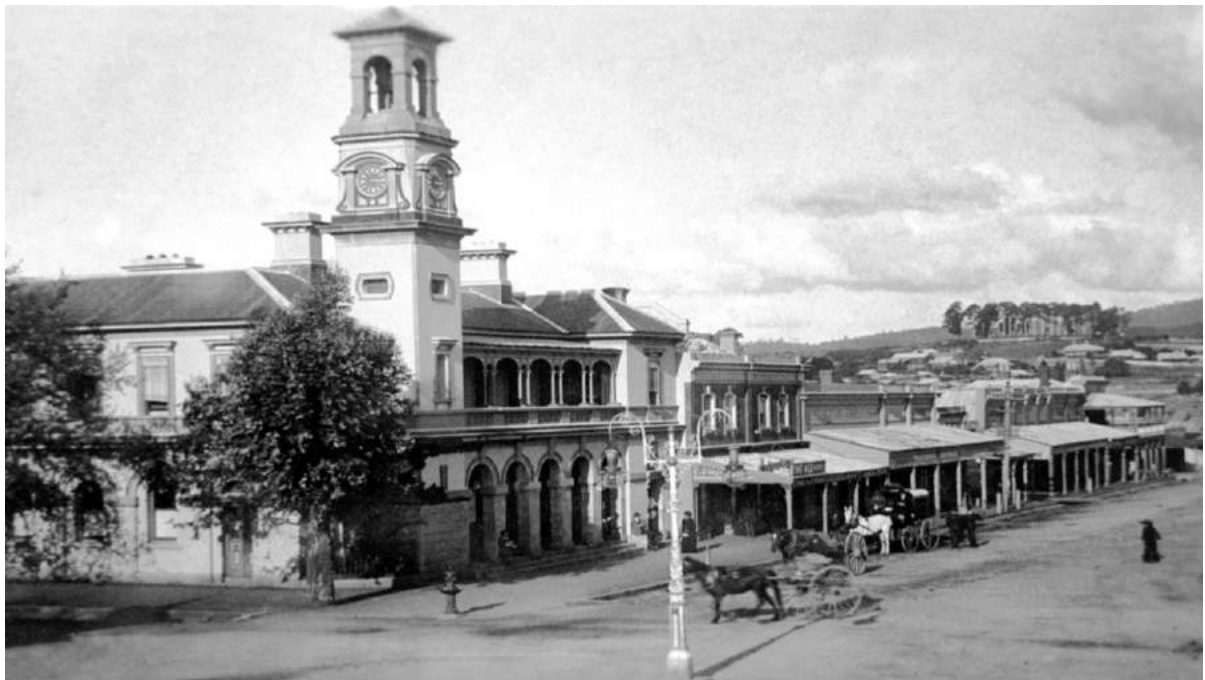
*19<sup>th</sup> Annual Conference*

*Diversity in Mining*

*29<sup>th</sup> September - 4<sup>th</sup> October, 2013*

*Beechworth*

*Victoria*





## Message from the Mayor

On behalf of Indigo Shire Council, welcome to Beechworth. Indigo Shire is home to Australia's greatest collection of historic villages, formed and preserved on the back of the discovery of gold.

People from all over the world were attracted to Beechworth when in February 1852 a local shepherd, Howell, with California '49ers Baker and Strickland, first discovered gold in what later became Beechworth at Cadman's Point 100m upstream from the Newtown Falls. Within a year 8000 miners had swarmed to the area. By January 1854, well over 100,000 ounces of gold had been taken out of the diggings around the Ovens District and Spring Creek. Beechworth soon became the central town of the Ovens Goldfields, and the administrative centre for North East Victoria. This was a period of rapid development for Beechworth and the population swelled to an impressive 30,000 on the Ovens Goldfields. Amongst these were the Chinese miners, who came to the Ovens Goldfields in the 1850s. At its peak, over 5,000 Chinese hopefuls lived in the area.

The gold fever that gripped Victoria from the 1850s until the early decades of the 20<sup>th</sup> century left an indelible mark on Beechworth and her sister towns of Chiltern, Rutherglen and Yackandandah, and the villages and countryside in between.

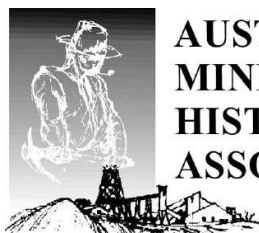
Everywhere, the legacy of the Gold Rush is clear – from the perfectly preserved streetscapes to mine shafts and mullock heaps to astonishing water races carved through solid rock; from Chinese Burning Towers and pioneer graves to historic government buildings, schools and museums. This legacy now forms part of our vital tourism industry.

I invite your members to immerse yourselves in our rich history. I know you will have vivid memories of your visit for a long time to come.

Cr Barb Murdoch

Mayor

Indigo Shire Council



## AUSTRALASIAN MINING HISTORY ASSOCIATION

### **PRESIDENT'S FOREWORD**

The AMHA Executive welcomes you to Beechworth and thanks you for attending the 19<sup>th</sup> Annual Conference. We are pleased to hold standalone mining history conferences in a variety of venues in Australasia, and this year it is in Beechworth, a mining heritage town of Victoria.

In 1824 Hume and Hovell travelled through the Beechworth area on their trip south to Port Phillip seeking pastoral country. Squatters followed, with David Reid taking up country for grazing, then the discovery of gold in 1852 provided new opportunities in the area, with miners flocking there. Beechworth was on the main Melbourne to Sydney road via Wangaratta, and the railway was opened on 30 September 1876.

Government invested heavily in major public buildings in the town, which form an attractive heritage precinct today. The Gold Trail includes: Beechworth Cemetery & Chinese Burning Towers; Chiltern Athenaeum & Museum; Great Northern Mine Rutherglen and the recently restored Battery; Traditional Miner's Hut at Yackandandah; The Cock's Eldorado Dredge; the 5km Lake Sambell to Lake Kerferd Walk; and the Historic & Cultural Precinct in Beechworth.

Our conferences concentrate on the minerals for which the particular area is famous – gold in this case – though our theme for 2013 of *'Diversity in Mining'* allows for papers on a wide range of topics. Papers cover early Beechworth mines and miners, their works and the heritage they have left; gold mining in Ireland, Cornwall, Alaska and other areas of Australasia; musical, safety and industrial stories; and, especially important to Beechworth, six papers on various aspects of Chinese mining in the eastern states.

This conference could not happen without the enthusiasm and energy of the Victorian sub-committee who have worked very hard over the past two years. Many association members identify the annual conference as an essential activity, and it is the dedication of local committees which makes this possible. Nor should we fail to thank the Mayor of the Shire of Indigo for her welcome, and the help given by council staff and the people of Beechworth.

Dr Ruth Kerr OAM

President AMHA

# Conference Program

## Saturday 28th September

### 8.30am– 5.00pm Pre-conference tour

The bus will depart from the Beechworth Memorial Hall at 8.30am to visit mining and historic sites in the **Rutherglen and Chiltern areas**. Lunch will be at the historic All Saints Winery. Conference satchels including tour guides will be made available to participants at the start of the tour.

## Sunday 29th September

### 11am – 4pm Registration in the Hall

Guided tours of the Historic Precinct will be organized during the afternoon (Yellow Card Pass in satchels). Meet outside the Information Centre at 2pm.

Sample the delights of the many Beechworth businesses.

Those with transport may like to explore the Spring Creek Gorge Circuit. **NB.** One-way road leaving from the Golden Horseshoe Pillar.

6.30 pm. **Mayoral Reception** in the Memorial Hall. (Cr Barb Murdoch)

## Monday 30<sup>th</sup> September

8.00 am onwards **Registration**

8.50 General organisational remarks.

9.00 **Welcome by Ruth Kerr**, President of AMHA

### Introductory Session

*Chair: Ruth Kerr*

9.10 – 10.05 **Robert Ashley**. Keynote address: *Searching for El Dorado: The life and times of Edward Bovill Chandler*.

10.05 – 10.35 **Andrew Swift**. *Hidden Mining Heritage of the Upper Ovens Goldfields, Beechworth Mining District*.

10.35 – 11.00 **Morning tea**.

## First Session – Local Beechworth Stories

*Chair: Ross Both*

11.00 – 11.30 **Jim Enever and Don Miller:** *A Great Undertaking: The Rocky Mountain Company Tunnel.*

11.30 – 12.00 **Jodi Turnbull:** *The Supply of Water to the Beechworth Diggings: Water Races and Water Rights.*

12.00 – 12.30 **Aert Driessen:** *The World of Industrial Minerals through the prism of Beechworth Feldspar.*

12.30 – 1.30 **Lunch**

## Second Session – Ireland and Cornwall

*Chair: Brian Hill*

1.30 – 2.00 **Louise Blake:** *Women on the Jordan Goldfields.*

2.00 – 2.30 **Susan Lawrence and Peter Davies:** *Cornish Precedents for Alluvial Working in Australia.*

2.30 – 3.00 **Anne Both:** *Trust the Cornish - the Hawke and Co foundry of Kapunda - a South Australian contribution to nineteenth century Australian mining and its legacy.*

3.00 – 3.30 **Afternoon tea**

## Third Session – Gold around Australia

*Chair: Adrian Hutton*

3.30 – 4.00 **Ken McQueen:** *Victoria's pioneering role in treating refractory gold ores.*

4.00 – 4.30 **Victor Bibby:** *The Story of Raub Gold: Castlemaine to Malaya: a Short History of the life in Australia of William Bibby, gold miner and engineer, from 1859 to 1889.*

4.30 – 5.00 **Lynnette Peterson:** *Reading the Landscape: a visible record of the puddling phase of gold mining at Bendigo, Victoria.*

7.30 **Evening Entertainment.** Ned Kelly trial re-enactment, at the Courthouse.

## Tuesday 1<sup>st</sup> October

### Fourth Session – Natural Disasters

*Chair: Nic Haygarth*

8.45 – 9.15 **Adrian Hutton:** *Collapse of the Wingecarribee Peat Swamp, NSW – Natural disaster or mining catastrophe?*

9.15 – 9.45 **Jan Wegner:** *Miners and Weeds.*

9.45 – 10.15 **Morning tea**

## Fifth Session - Australian Industrial Stories

*Chair: Peter Bell*

10.15 – 10.45 **Samantha Killmore, Post-Graduate Grant Winner:** *When the Dust Settles: Henry George Chapman and the Broken Hill Strikes, 1919-1920.*

10.45 – 11.15 **Mike Butcher, Yolande Collins and Peter Purcell:** *Nicolas Boutakoff - a pioneer petroleum geologist remembered.*

11.15 – 11.45 **Barry Sykes:** *The 1903-4 strike on the Korumburra (black) Coalfields.*

11.45 – 12.30 **Lunch**

13.00 – Depart for **TOUR** to Woolshed Valley and Eldorado dredge.

19.00 **Advisory Committee** meeting, Hotel Nicholas. **All others**, own evening arrangements.

## Wednesday 2<sup>nd</sup> October

8.30 Buses depart for full day tour to **Buckland Valley and Bright**. Own evening arrangements.

## Thursday 3<sup>rd</sup> October

### Sixth Session – Chinese Mining in Victoria

*Chair: Barry McGowan*

9.00 – 9.30 **Paul Macgregor:** *The Kong Meng deep lead and quartz mines of central Victoria 1860s-1880s: A stellar investment strategy.*

9.30 – 10.00 **Vivienne McWaters:** *The Wooragee Enterprise, Beechworth.*

10.00 – 10.30 **Henry Gunstone:** *Ararat, the forgotten Chinese goldfield.*

10.30 – 11.00 **Morning Tea**

### Seventh Session - Social and Economic Aspects of Chinese Mining in Australia

*Chair: Paul Macgregor*

11.00 – 11.30 **Barry McGowan:** *Kongsis, huis and clans: The economics and organisation of Chinese alluvial mining, with particular reference to the Braidwood, Kiandra and Adelong goldfields of Southern NSW and the tin fields of Northern NSW.*

11.30 – 12.00 **Pauline Rule:** *The missionary, the interpreter and the mining capitalist: Two Chinese brothers in the Victorian gold rush.*

12.00 – 12.30 **Emily Cheah Ah-Qune:** *A goldfields Chinese-English phrase book.*

12.30 – 1.30 **Lunch**

### **Eighth Session – More on Australian Gold**

*Chair: Ken McQueen*

1.30 – 2.00 **Joan Hunt:** *“Success will smile upon us”*: The discovery of the Springdallah goldfields.

2.00 – 2.30 **Ross Both:** *Songs from the Australian mining fields: the forgotten side of mining history.*

2.30 – 3.00 **Don Perkin:** *Gold production from dredges and from other types of alluvial mining in north-east Victoria from 1851 to 1945.*

3.00 – 3.30 **Afternoon tea**

### **Ninth Session – More Industrial Stories**

*Chair: Mel Davies*

3.30 – 4.00 **Nic Haygarth:** *The original Gordon-below-Franklin dispute: BHP and the ‘Marble Cliffs’*

4.00 – 4.30 **Leonie Knapman:** *South Marulan Limestone Quarry - Building Australia.*

4.30 – 5.00 **Gordon Boyce:** *A consideration of trends in the global shipment of minerals, 1870-1970.*

6.30 **AMHA Conference Dinner** at the **Hotel Nicholas**. The raffle will be drawn during the evening.

## **Friday 4th October**

9.00 – 12.45 **AGM:** Break for morning tea 10.30 – 11.00

12.45– 1.45 **Lunch**

### **Tenth Session – Mining Across the Water**

*Chair: David Kippen*

1.45 – 2.15 **Philip Hart:** *Peter Ferguson and his New Era.*

2.15 – 2.45 **Trevor Rootes, Post-Graduate Grant Winner:** *The Ringarooma River Dredging Bubble and Boom, 1905-1910.*

2.45 – 3.15 **John Barry:** *The Land of Pay: The Gold Dredging History and Mining Archaeology of the Solomon valley, Alaska.*

3.15 – 3.45 **Afternoon tea**

### **Eleventh Session – From Writing to Digging**

*Chair: Leonie Knapman*

3.45 – 4.15 **Richard Hartley**: *Preparing biographies of mining engineers and metallurgists in Western Australia 1890-1930.*

4.15 – 4.45 **David Branagan**: *Uriah Dudley – a neglected mining pioneer.*

4.45 – 5.15 **Peter Bell**: *The Tarcoola Goldfield.*

## **CLOSE OF CONFERENCE**

then **HALL CLEAN UP**, followed by drinks and finger food in Supper Room/RSL Bar.

### **Saturday 5<sup>th</sup> October**

8.30 – 5.00 Post conference tour to **Bethanga and Yackandandah**, ‘**In the footsteps of John Alston Wallace**’. Bus leaves from the Memorial Hall.



## ABSTRACTS

**ROBERT ASHLEY**, Historian.

**KEYNOTE ADDRESS**

### **SEARCHING FOR EL DORADO: THE LIFE AND TIMES OF EDWARD BOVILL CHANDLER**

This paper is presented as an illustration of the life of a gold miner who played an important role in the history of the famous and fabulously rich Woolshed during the 1850s. As an introduction to Beechworth, an attempt will be made to illustrate how this gold field captured the imagination of miners and will show how one man in particular, almost omitted from the history books, was central to the rich stories and myths that have ever since been a highlight of the 'city in the wilderness'. This paper will give a picture of the mining and political concerns of the time along with the human side of life. Mentioned infrequently, Edward Bovill Chandler's history is largely unknown, yet he is one of the Woolshed bosses connected with the famous *Golden Horseshoes* event and is therefore of considerable interest. His sad end in Queensland in an unmarked grave on Stradbroke Island has long remained a secret, yet such was the fate of many miners who struck it rich only to vanish into the detritus of history.

**JOHN BARRY**, Consulting Geologist.

### **THE LAND OF PAY: THE GOLD DREDGING HISTORY AND MINING ARCHAEOLOGY OF THE SOLOMON VALLEY, ALASKA**

While New Zealand in the late 1800s was at the forefront of gold dredge development, little remains of the appliances which revolutionised the mining of low grade gold, tin and platinum placers. By far the most enduring legacy of gold dredging in New Zealand are the vast areas of tailings from the elevator-equipped American style dredges of the second dredging boom. Most of the early dredges were recycled, or the machinery sold and the pontoon abandoned. Apart from two dredges that were dismantled and reassembled off-shore, and a single recycled one, steel dredges from the 1930s dredging boom were scrapped. Although the Historic Places Act (1993) and amendments (2003) to the Resource Management Act (1991) make historic heritage a matter of national importance, little has survived time, scrap metal dealers and vandalism. In contrast, in Alaska and the Yukon, abandoned mining equipment was often safeguarded by isolation and the harsh environment, and over time these artefacts have assumed national historic importance. The mining history of a remote Alaskan Valley will be presented, with illustrations of the present condition of the machinery which accounted for most of the gold production.

**Dr CLIVE BEAUCHAMP**, Adjunct Associate Professor, Charles Sturt University, Bathurst.

**DISASTER AT STANFORD-MERTHYR (THE “WELSH MINE”), KURRI KURRI,  
NSW, 1905**

In October 1905, a fire and explosion at the Stanford-Merthyr colliery resulted in five fatalities and nine miners suffering serious injuries. The disaster had some significant and unusual features. It occurred when no one was underground; those killed were all mining officials; four out of the five deceased were Welsh migrants and there were also allegations of arson. The paper traces briefly the history of the mine; the rescue attempts; the sealing of the mine and its re-opening. There is special focus on the proceedings of the Coroner's inquest including its findings and recommendations. The disaster's impact is also considered. (Unfortunately, due to illness, Clive has had to withdraw his paper.)

**Dr PETER BELL**, Consulting Historian.

**THE TARCOOLA GOLDFIELD**

If you were looking for a gold rush to go to in the depression of 1893, you probably wouldn't have picked Tarcoola. The new gold discovery was about 600km north-west of Adelaide in the South Australian desert, one of the most arid landscapes on earth. It was a long way from the coast or the nearest river, road or railway line, and camels provided the only means of transport to the field for the first 20 years. Tarcoola somehow produced gold for 60 years, in a protracted struggle against isolation, water shortage, horrendous transport costs, shortage of labour and refractory ore bodies. In an interesting case study in economic geography, even the arrival of the Trans-Australian railway in 1915 failed to bring an upturn, for the field's difficulties were never going to be that simple to resolve. Only a heavily subsidised government battery kept the field alive until 1954. Now a diamond drilling campaign has identified previously undiscovered ore deposits, and Tarcoola may rise again.

**VICTOR BIBBY**, retired Aeronautical Engineer.

**THE STORY OF RAUB GOLD: CASTLEMAINE TO MALAYA: A SHORT  
HISTORY OF THE LIFE IN AUSTRALIA OF WILLIAM BIBBY, GOLD MINER  
AND ENGINEER, FROM 1859 TO 1889**

This paper is a short history of William Bibby, who started the Raub Australian Gold mine in the British Protected State of Pahang, Malaya in 1889 for the Brisbane Raub Australia Syndicate, and was the first mine manager. It is composed of extracts from William's Story, an unpublished biography written by one his great grandsons. The paper covers the period from arriving in Australia in 1859 up to his departure from Brisbane to Malaya in August 1889. After arrival in Sydney and travelling to Melbourne, he was appointed as a mine manager near Muckleford, married in Taradale and moved to Maldon. After one period of

bankruptcy, and the birth of his first children, he moved to Guildford in 1866, recovered his fortunes, and moved on to Barkers Creek. There was some prosperous time in Castlemaine, during which he took out a patent for a steam driven stamp, and he and his growing family moved to Cloncurry and the Gilded Rose mine, then to Normanton following the Croydon rush. Here he was successful, and his mill was the first to crush ore. He then moved to Brisbane where he became a ‘man about town’, participating in deputations to ministers and making many other social contacts.

**LOUISE BLAKE**, Historian and PhD candidate, Monash University.

### **WOMEN ON THE JORDAN GOLDFIELDS**

Since the 1970s the work of feminist scholars, social historians, genealogists, archaeologists, and heritage professionals has broadened our understanding of Victorian goldfields history, moving beyond the traditional masculine Anglo-centric mythology to a more diverse history that also tells the stories of women, families, and community life on the goldfields. Much of this scholarship, however, is dominated by the central Victorian goldfields. Other regions, such as the Jordan goldfields between Jamieson and Walhalla, have not received the same scholarly attention.

This paper addresses this geographic gap in the revisionist scholarship of the Victorian goldfields, and questions what might be learnt about women, families and community life on the goldfields by studying regions such as the Jordan.

**ANNE BOTH**, Historian.

### **TRUST THE CORNISH - THE HAWKE AND CO FOUNDRY OF KAPUNDA - A SOUTH AUSTRALIAN CONTRIBUTION TO NINETEENTH CENTURY AUSTRALIAN MINING AND ITS LEGACY**

The Hawke Foundry was established at Kapunda by Cornish engineer H B Hawke in 1857. Early days of its operation saw production of farming tools and machinery, and then castings for Kapunda Copper Mine in 1868. The foundry designed and supplied a wide variety of mining plant over many decades. Now relocated to Victoria under new management and operating as Ultrahawke, the tradition of design, manufacture and supply to fulfill the needs of mining continues. This paper provides a brief history of the original company, an overview of its manufactures, and their Australia wide distribution.

**Professor ROSS BOTH**, retired Geologist.

**SONGS FROM THE AUSTRALIAN MINING FIELDS: THE FORGOTTEN SIDE OF MINING HISTORY**

Songs from the Australian mining fields that have been handed down from singer to singer and collected by folklorists (notably John Meredith and Warren Fahey) have become part of the traditional Australian folk music genre. The significance of these songs and their relevance to mining history is generally overlooked. Many of the songs record experiences of miners or events that took place on the mining fields. The presentation will use fragments of song recordings to illustrate early life and events on the goldfields, industrial unrest, introduction of new technology, and racial tensions.

**Professor GORDON BOYCE**, Economic, Mining and Transport Historian.

**A CONSIDERATION OF TRENDS IN THE GLOBAL SHIPMENT OF MINERALS, 1870-1970**

The paper presents a preliminary analysis of changes in the transport of minerals and related materials by British tramp and bulk shipping firms between 1870 and 1970. Forming part of a large study of about thirty British tramp shipping firms, the presentation focuses on the oceanic conveyance of coal, ores (iron, manganese, copper, and nickel), as well as natural fertilizers and oil. The aim is to provide a complementary view of mining activities by considering shifts in the sources and markets for mineral output, and the challenges of providing transport for these materials in an increasingly industrialised world economy.

This article presents a brief overview of changing trends and patterns in mineral traffic and then examines the activities of several individual shipping firms in order to expose the commercial dynamics of this business activity. It explores the significance of on-going commercial relationships, changes in technology and vessel design, evolving vertical ownership links, and shifts in demand and supply. The study commences at a time when spreading industrialisation, salient cost-reducing technical developments, and favourable demand conditions led to the creation of what some scholars have called “the first global economy”. It concludes during the period in which the British merchant marine, which had hitherto represented the world’s foremost transport organisation, contracted precipitously in the face of growing international competition.

**Emeritus Professor DAVID BRANAGAN**, School of Geosciences, University of Sydney.

**URIAH DUDLEY – A NEGLECTED MINING PIONEER**

Uriah Dudley (ca. 1853 – 1909) is remembered for his part in the formation of the Australasian Institute of Mining Engineers (later AustIMM) at Broken Hill in 1893, and as its first Secretary-Treasurer. Dudley was then Manager of the Umberumberka Mine, Silverton, and played a major part in the community. He was a good practical mining engineer, as his

paper, 'Use of three-dimensional glass models of Mines', presented at the Institute's first meeting, shows. Dudley later spent several periods in Western Australia, alternating with periods in the east. His death in Sydney, aged only 56, elicited little notice in mining circles.

**MIKE BUTCHER, Historian;** Dr YOLANDE MJ COLLINS, Historian; and PETER PURCELL, Geological Consultant.

### **NICOLAS BOUTAKOFF: A PIONEER PETROLEUM GEOLOGIST REMEMBERED**

Dr Nicolas Boutakoff was one of the most experienced oil geologists in Australia when systematic exploration began in the decades after WWII, and his ideas led to important oil and gas discoveries for Australian interests. Yet little is known of him, and what has been written is sometimes incorrect. This paper looks at his contributions to the important discoveries that took place in the North-West Shelf off Western Australia and the Northern Territory, the complexity of his life as an experienced international geologist seeking to find a place in Australian society, and examines his later years, which were spent working, almost obsessively, on a model of tectonics which never quite made its mark.

What was the extent of his contribution to the important economic discoveries of oil and gas in Australia? Why were his efforts discounted? Why did Boutakoff's career, after a very promising start as a geologist in the Belgian Congo and the West Indies, contract to such an extent that he became the embittered and isolated figure that he did? The answers are of course complex, but two discernible themes emerge. Firstly, he found himself in a work situation to which he was not suited, which was often conflicted and to which he had difficulty adapting. Secondly, Australia's cultural milieu in the 1950s and 1960s was still primarily British. Post-war immigration to Australia was taking place, but attitudes were still pro-British and anti-Continental. Boutakoff's personality - aristocratic with a fondness for theory, naive in business matters and conservative (with an almost paranoid fear of Bolshevism) - contributed to his increased isolation at work in the Victorian Geological Survey. In his personal life, after his second marriage, he became part of a Latvian community that feared communism and revered religion. What emerges after examining the documentation and listening to the interviews of those who knew him, is a man who, although clearly gifted, appeared to be almost schizoid – gentle and loving in his personal life, but in his professional life he is described as aloof, unable to fit in and obsessive.

**EMILY CHEAH AH-QNE**, Exhibitions and Public Programs Officer for the Chinese Museum, Melbourne.

### **A GOLDFIELDS CHINESE-ENGLISH PHRASE BOOK**

This paper examines an 1860s Cantonese-English phrasebook held by the Chinese Museum in Melbourne. Published in Canton province for Cantonese speakers, it contains phrases, whole

conversations and important place names useful for Cantonese miners in mid-19<sup>th</sup> century Victoria. The place names also reflect key sites and districts in the gold fields that may have been of significant interest to the Chinese. The phrasebook allows us to explore the concerns and aspirations of the Chinese community, and highlights the importance of Chinese associations and clan relations. From language acquisition, daily concerns, and lifestyles, to crime and punishment, morals and philosophy, this phrasebook is an enticing document which enables us to partake in the lives of those who lived on the gold fields.

**AERT DRIESSEN**, retired Exploration and Mining Geologist, and Commodity Analyst.

### **THE WORLD OF INDUSTRIAL MINERALS THROUGH THE PRISM OF BEECHWORTH FELDSPAR**

Feldspar is but one of many so-called industrial minerals about which the general public and even many geologists know very little because their applications and end-uses are mostly invisible. The mining and processing of these mineral commodities, but especially their marketing, is very different from the more visible and high profile base and precious metals. One very notable feature is that none are sold on terminal markets such as the London Metal Exchange, and this builds strong and special relationships between producers and consumers.

**Dr JIM ENEVER**, retired Mining Engineer, and **DON MILLER**, retired Consulting Geologist.

### **A GREAT UNDERTAKING: THE ROCKY MOUNTAIN COMPANY TUNNEL**

The Rocky Mountain Gold Sluicing Company and its successor, The Rocky Mountain Extended Gold Sluicing Company, were major gold producers on the Beechworth field over an extended period from 1867 into the early twentieth century. To facilitate hydraulic sluicing operations on the upper reaches of Spring Creek to the immediate east of the town, the first company undertook the construction of an extensive rock cut tailrace through solid granite to a point above the Spring Creek Gorge below the town. While this was a feat in its own right, it was the excavation by the second company of a tail race tunnel for 3,600 feet through the same tough granite, directly beneath the town, that is remembered as something of an engineering marvel for the time. The tunnel and an associated surface channel at the top end allowed tail water from the deeper wash, encountered as activities moved further up Spring Creek, to be discharged into the Spring Creek Gorge at a point below the discharge of the original open tailrace. Construction of the tunnel took around three and a half years and was notable as one of the first applications of rock boring machines in Victoria.

**HENRY GUNSTONE**, Historian, Gum San Museum, Ararat.

### **ARARAT, THE FORGOTTEN CHINESE GOLDFIELD**

Seeking to find some relief for themselves and their families from their dislocated economic life in Southern China, thousands of Chinese men indebted themselves to travel to the goldfields, often enduring conditions on ship worse than those of early British convicts. To discourage this influx the Victorian Government imposed a £10 poll tax, forcing ships' captains to take the men to Adelaide or Guichen Bay (Robe) to avoid the tax; the Chinese then finding their own way to the Victorian goldfields. It was one such group that stumbled across the Canton Lead, and founded the Ararat goldfield, one of Australia's richest alluvial fields. This paper recounts the lives of the Chinese in China before their emigration to Australia, their journey overland to Ararat, their striking success in their early days, their resilience in maintaining their cultural cohesion in the face of discrimination and prejudice from Europeans, and their ability to carve out a niche for themselves in this new and alien environment.

**Dr NIC HAYGARTH**, Historian

People power stopped development of Tasmania's lower Gordon River in 1914, almost 70 years before the famous Gordon-below Franklin Dam Blockade. The proposed development was not a hydro-electric dam impoundment but a mine. BHP wanted to quarry one of the jewels of the lower Gordon, the so-called 'Marble Cliffs', for smelting purposes flux. Remarkably, a pro-development premier from west coast mining fields vetoed the proposal. However, BHP's substitute limestone quarry at Melrose, south of Devenport, paid an unexpected geological dividend.

**Dr PHILIP HART**, Historian.

### **PETER FERGUSON AND HIS NEW ERA**

Born in Scotland, Peter Ferguson became a mine manager and mining company director in Thames before prospecting at Te Aroha just before the proclamation of the goldfield there. A belligerent personality who was prominent in community affairs and local government as well as mining, he sought to break the monopoly of the Battery Company at Waiorongomai, a challenge that defeated several other syndicates. Commencing in 1884, his efforts led to the creation of the New Era syndicate, which struggled to raise sufficient capital. An Auckland foundry contributed both finance and new machinery that was optimistically claimed to supercede existing processes, but it was difficult to overcome both the self-interest of the existing battery owners, and local and national governments' unwillingness to provide financial assistance before a new road and branch tramway were constructed to the machine site, far up the valley. Once operations commenced, in 1886, the new process was quickly proved to be unsuccessful. Undeterred, Ferguson formed the Ferguson Syndicate Company in

Glasgow in late 1888, its shareholders including the inventors of the MacArthur-Forrest cyanide process, which was to be trialed. This new company, also under-capitalized, erected new machinery, but when the first crushing was made in 1890 cyanide was not used and the results were a failure. The tramway and machinery were dismantled, and Ferguson abandoned Waiorongomai, defeated not only by untried machinery and inadequate capital but by a fundamental problem, low grade and unpayable ore.

**Professor RICHARD HARTLEY**, Retired Engineer.

### **PREPARING BIOGRAPHIES OF MINING ENGINEERS AND METALLURGISTS IN WESTERN AUSTRALIA 1890-1930**

This biographical digest by Hartley and Cumming has had a long gestational time mainly due to the untimely death of Denis Cumming, one of its co-authors, nearly 20 years ago. The phenomenal extent of the Western Australian gold mining industry in its boom years is sometimes overlooked. Between 1890 and 1930 there were no less than 4900 mines which produced gold, many of which by 1930 had been mined 2 or 3 times by different parties. Others have written on the promotional and financial aspects of companies in that period, but the present authors were particularly interested in the mines' Western Australian management. When we first combined our biographical indexes of mine managers, mining engineers, metallurgists and other mining technologists we found that we had records relating to 942 separate individuals, not a total which could be readily tackled in detail. The main problem was how to arrive at entries which could be researched adequately and written up in a useful and interesting way. This paper discusses how the main categories of entry were chosen. These were: people of importance to international mining; innovators of mining and metallurgical technologies; influential managers in state mining; people who became influential in other state and national affairs, and typical men attracted by the gold rush who became company staffers and about whom we have interesting records. Some examples are given. In the digest there are now 330 entries.

**JOAN HUNT**, PhD candidate, University of Ballarat.

### **“SUCCESS WILL SMILE UPON US”: THE DISCOVERY OF THE SPRINGDALLAH GOLDFIELDS**

Most Australian goldfield townships resulted from serendipitous discoveries. However, this paper will argue that the discovery of the Springdallah goldfield situated between Ballarat and Geelong was the result of a systematic, carefully planned strategy by a consortium of businessmen. The objective of the Geelong Gold Exploration Committee, formed in mid 1852, was to find a payable goldfield closer to Corio Bay than to Melbourne. The exploration party of five men was led by an extraordinary ex-convict, Herbert Swindells, whose published reports resulted in nine goldfield communities being created on the Woody Yaloak and Springdallah creeks.



**Dr ADRIAN HUTTON**, Retired Geologist.

### **COLLAPSE OF THE WINGECARRIBEE PEAT SWAMP, NSW – NATURAL DISASTER OR MINING CATASTROPHE?**

Wingecarribee Swamp is located near Robertson in the Southern Highlands of NSW and contained the largest peat deposit on the mainland. A dam wall was built at the western end of the swamp in the 1970s, to convert the western part of the swamp into a reservoir which is now part of the water supply infrastructure for Sydney and local towns. A large area of peat was inundated. Peat was mined from the middle of the 20<sup>th</sup> Century to 1998, and at one stage the mining operations supplied the majority of Australia's peat needs. The last company to mine peat was the Emerald Peat Company, which used a wet mining technique. During the 1990s local residents became increasingly concerned as to the impact of the peat mining on water quality and in 1996, the State Government instigated a mining wardens' inquiry to ascertain the impact of mining and to determine if mining should continue. Mining continued whilst the inquiry was held, although the licence had not been renewed. On 7<sup>th</sup> August 1998, unusually heavy rain occurred in the Robertson area and the peat deposit collapsed, with large amounts of peat carried into the reservoir. This paper looks at the causes of the collapse and attempts to determine whether the collapse was a natural disaster or a mining catastrophe.

**SAMANTHA KILLMORE**, PhD student, Sydney University, 2013 AMHA student prizewinner

### **WHEN THE DUST SETTLES: HENRY GEORGE CHAPMAN AND THE BROKEN HILL STRIKES, 1919 - 1920**

A statistical study may not resolve a moral problem, but it can certainly go a long way in obscuring one. In the case of the Technical Commission of Inquiry into the prevalence of miners' phthisis and pneumoconiosis in Broken Hill during 1919 – 1920, this rings true. The Chairman of this Inquiry, Professor Henry George Chapman, was particularly influential in resolving this conflict. He successfully presented the epidemiological study as the only way to resolve the conflicting interests between Unions, miners, government bodies, and the corporations. In turn, this study formed a part of Chapman's strategy to promote the pursuit of applied science, particularly in terms of industrial health. As such, the Broken Hill Inquiry should not be considered an isolated site for medical research in Australia during the 20<sup>th</sup> Century, but in the broader context of history of Australian Medical Science.

This paper focuses on how the study was pushed by Chapman, who had a long history as an advocate of applied science and public health. This particular study was pivotal in the refinement of the growing field of anthropometry, or measurement of the human body. Because of this, I will also examine the impact this study had on the wider history of industrial health, and the anthropometrical movement.

**LEONIE KNAPMAN**, Historian and Author.

### **SOUTH MARULAN LIMESTONE QUARRY - BUILDING AUSTRALIA**

Located 165 km south-west of Sydney, South Marulan quarry is the largest in the Southern Hemisphere providing a raw ingredient of cement. Quarrying has been carried out to varying degrees since 1875, and the current site of the quarry has been worked by a number of companies since the 1920s. By the 1970s there were two adjoining quarries, each independently owned and operated. The southern quarry supplied limestone for the Maldon cement works of Associated Portland Cement Manufacturers (Australia) Limited, and the northern quarry was operated by Southern Portland Cement Limited, a subsidiary of BHP. It provided limestone for the Berrima cement works and the Port Kembla steelworks. In 1974 the two companies amalgamated and became Blue Circle Southern Cement, Ltd which later became part of Boral Ltd.

As a raw material for cement, Marulan limestone has played a major role in the development of NSW and the Australian Capital Territory, and its mark is instantly recognisable. Major projects include the Snowy Mountains Hydro-electric Scheme, Warragamba Dam, Sydney Opera House, New Parliament House in Canberra, and the Darling Harbour complex. On the ocean floor, Marulan cement is in the submarine outfalls for Sydney's sewage system and encloses the immersed tubes of the Sydney Harbour Tunnel.

South Marulan quarry is bordered by the mountainous Bungonia State Recreation Area in the east and as such is constantly under critical public scrutiny. Present-day mining follows a development plan based on advanced techniques and detailed technical data, and a range of expert assistance has been sought in developing appropriate strategies. The absence of a plentiful water supply, and the need to rehabilitate the area when mining ceases require an integrated approach to mining.

This presentation looks at the history of the project, importance to building Australia, and present-day mining operations.

**Associate Professor SUSAN LAWRENCE** and Research Associate **PETER DAVIES**,  
Archaeology Program, La Trobe University, Melbourne.

### **CORNISH PRECEDENTS FOR ALLUVIAL WORKING IN AUSTRALIA**

The large Cornish presence in Australia and their contributions to hard rock mining of copper, gold, and tin is well-known. Cornwall also has an ancient and extensive tradition of working alluvial tin deposits or 'tin streaming'. This paper explores extraction and processing methods used in tin streaming from the medieval period until the nineteenth century, in order to identify possible origins for the methods used in sluicing gold and tin deposits in Australia. Archaeological and documentary sources in Cornwall and Victoria provide evidence of the similarities and differences in the two regions.

**Dr BARRY McGOWAN**, Canberra-based Heritage Consultant and Historian, and a Visiting Fellow at the School of Archaeology and Anthropology and the College of Asia and the Pacific, Australian National University (ANU).

**KONGSIS, HUIS AND CLANS: THE ECONOMICS AND ORGANISATION OF CHINESE ALLUVIAL MINING, WITH PARTICULAR REFERENCE TO THE BRAIDWOOD, KIANDRA AND ADELONG GOLDFIELDS OF SOUTHERN NSW AND THE TIN FIELDS OF NORTHERN NSW**

The success of the Chinese miners in the colonial period in Australia was often attributed by local reporters and mining officials to their ability to work in large cooperative groups. Historians such as John Fitzgerald and Mai Ngae have argued that the organisation of Chinese mining bore a very strong resemblance to the co-operative Chinese *kongis* of South East Asia, in particular at Kalimantan and Bangka Island in Indonesia, and parts of the Malayan Peninsula. Drawing upon examples from the alluvial mining fields on the Braidwood, Kiandra and Adelong goldfields of southern NSW and the tin fields of Northern NSW, I will argue in support of Fitzgerald and Ngae, and suggest that the Chinese *kongsi* model explains much about the profitability of Chinese mining and the social organisation of the Chinese miners, and the resentment by some European miners at their success. Many Europeans worked cooperatively, but generally were not as successful as the Chinese miners, for whom the *kongsi* was as much a social organisation as an economic one.

**PAUL MCGREGOR**, Historian

**THE KONG MENG DEEP LEAD AND QUARTZ MINES OF CENTRAL VICTORIA 1860S-1880S: A STELLAR INVESTMENT STRATEGY**

Penang-born Chinese international trader, Lowe Kong Meng, one of the richest men in goldrush Melbourne, made his first fortune from importing food and supplies for the 45,000 Chinese miners in Victoria in the 1850s-1860s. In 1864, he took over a deep lead mine at Majorca from a party of Chinese diggers, and this led to a string of deep lead and quartz mines that bore his name or benefited from his directorship, some of the most famous mines in the colony in the 1860s-1880s. An expert in minerals, and a keen technological pioneer, he also involved himself in silver and coal, and had a wide range of mining investments by the time of his death in 1888. His career belies the myth that Chinese were wary of underground and capital-intensive mining.

**Dr KEN McQUEEN**, Professor of Geochemistry and Landscape Evolution, Faculty of Applied Science, University of Canberra ACT 2601.

### **VICTORIA'S PIONEERING ROLE IN TREATING REFRACTORY GOLD ORES**

Many early experiments and developments in processing refractory gold ores were made in the Victorian goldfields in the mid to late 19<sup>th</sup> Century. Gold mining centres such as Clunes, Bendigo and Ballarat became 'centres of excellence' for the efficient processing of gold ores, and ideas and techniques were soon transferred to other goldfields in Australia and around the world. Techniques such as routine assaying of tailings, fine grinding, roasting and chlorination were pioneered and refined in Victoria. Smelting methods were also developed to treat highly refractory, gold-bearing sulfide ores, for example at Bethanga and Glen Wills. In 1900 the first experiments in the flotation process, to separate ore minerals from their gangue, were pioneered by consulting brewer and chemist Charles Potter at his Balaclava laboratory in Melbourne. Initially developed to treat base metal ores, such as those at Broken Hill, selective flotation combined with fine grinding, pyrite oxidation and the cyanide process would ultimately revolutionise the treatment of refractory gold ores.

**VIVIENNE McWATERS**, Historian.

### **THE WOORAGEE ENTERPRISE, BEECHWORTH**

The Chinese miners in Wooragee, near Beechworth, set up a sophisticated dredging operation, as opposed to the other smaller alluvial mines typical in North East Victoria. With prominent businessman Ah Catt as its main shareholder, the Wooragee Gold Mining and Dredging Company was the largest Chinese-owned mine in Beechworth, used the latest mining techniques, and took considerable time to develop. The venture required a high level of Chinese-European collaboration, was floated on the stock exchange in Melbourne to raise the initial and subsequent capital, and prospered during the early 1900s.

**DON PERKIN**, Geologist and Historian.

### **GOLD PRODUCTION FROM DREDGES AND FROM OTHER TYPES OF ALLUVIAL MINING IN NORTH-EAST VICTORIA FROM 1851 TO 1945**

Since the almost simultaneous 'discovery' of alluvial gold in Victoria and NSW in 1851 there has been a contrasting history between the two rival states in the production and exploitation of gold found buried in the alluvium. It is a little known fact that the production of gold recovered from both shallow and deep river beds in Victoria vastly outweighs that produced from the alluvium via panning dishes, cradles, sluicing and dredges in NSW for the period 1851 to 1945 by a factor of five times.

The amount of alluvial gold that lies concentrated in any given hard-rock goldfield very much depends on the climate, the degree of weathering in the area, the uplift or steepness and evolutionary history of the topography, the distribution and intensity of gold mineralisation throughout the elevated source rocks, and their total precious metal endowment. Part of the reason that Victoria has produced far more alluvial gold than NSW is because Victoria possesses a great proportion of hilly country that is more gold prone than does NSW.

Other aspects leading to Victoria's dominance in alluvial gold production have been in the greater use of large scale dredging techniques, and by working large alluvial river systems, including the abundant deep lead alluvials, over greater lengths and for a more sustained period compared with her northern rival. This resulted in twice as much gold being recovered from dredges in Victoria as in NSW.

Victoria can lay claim to being one of the worlds richest alluvial gold provinces, while the greater Beechworth goldfield (North East Victoria district) itself has been responsible for the production of significant amounts of alluvial gold compared with its nearest rivals in the Bendigo and Ballarat goldfields. These produced more total gold (alluvial plus hardrock sources), but proportionally less alluvial gold.

The advances in the technology of dredge design since the early 1890s by local Victorians and also New Zealand (Otago-Southland) entrepreneurs, has been a vital factor influencing commercial proposals to initiate large scale mining on a sustainable basis. Dredge barges floating in migrating ponds over the gold-rich river gravels provided instant remediation and restoration of the river topography, as it was continuously mined and treated.

**Dr LYNNETTE PETERSON**, Historical Geographer.

### **READING THE LANDSCAPE: A VISIBLE RECORD OF THE PUDDLING PHASE OF GOLD MINING AT BENDIGO, VICTORIA**

'Sludge' residual from the puddling phase of gold mining in the Bendigo area (mid 1850s - early 1860s) was reported to have choked Bendigo Creek, inundating much of the low-lying land both within the Bendigo area itself and downstream along Bendigo Creek. The 1859 *Report Of The Royal Commission Appointed To Enquire Into The Best Method of Removing The Sludge From the Gold Fields* formed the basis of a project to determine the extent of that inundation, and its effects, if any, on land-use today.

The creation of a digital spatial database combining information from that Report with modern maps and field data has enabled the full extent of the inundation to be mapped, and its continuing effects on land-use in the area to be considered.

Downstream from Bendigo over 700 square kilometres of well-structured pre-mining soils feature a capping of fine-grained, hard-setting clayey sludge, making the already low-relief even more subdued, and disrupting the natural drainage of the area.

In today's terms this legacy of the puddling phase of gold mining at Bendigo is a case of considerable and extensive landscape degradation, the effects of which will be with us for the

foreseeable future.

**TREVOR ROOTES**, MA candidate, University of Tasmania, 2013 AMHA student prizewinner.

**THE RINGAROOMA RIVER DREDGING BUBBLE AND BOOM, 1905-1910**

The presentation will explore the tin dredging bubble and boom on the Ringarooma River in northeast Tasmania between 1905 and 1910. It will examine the operations of the three companies involved, the Gladstone Tin Development Company, the Ringarooma Bucket Dredging Company and the Dorset Bucket Dredging Company, and propose reasons for the bubble and why it burst. An intertwined theme will focus on the activities of Mr Laurance Wiliam Grayson, a mining engineer, a central character in the floating and demise of the three companies.

**PAULINE RULE**, Historian. Senior Research Assistant in Archaeology at La Trobe University.

**THE MISSIONARY, THE INTERPRETER AND THE MINING CAPITALIST: TWO CHINESE BROTHERS IN THE VICTORIAN GOLD RUSH**

The brothers Ho A Low and Ho A Mei came to Victoria in the 1850s as Christian missionaries trained in Hong Kong. As Government Interpreter in Beechworth at the time of the Buckland riots, Ho A Low experienced the suffering and the racial conflict confronting the Chinese diggers, and actively campaigned against this to the colony's Europeans. Ho A Mei took to capitalist mining, invested in the 1860s Woods Point quartz bubble, managed the early movement of Chinese from Victoria to the Otago diggings, then returned to Hong Kong to establish a modern silver mine at Lantau Island. He acquired technological and capitalist know-how in an Australian mining context, and brought these modernist approaches to the development of mining in south China, eventually obtaining the rights to all mineral concessions in Guangdong and Guangxi provinces.

**ANDREW SWIFT**, Mining Historian, Walking Track Manager and Cultural Heritage Officer, Mt Hotham Alpine Resort.

**HIDDEN MINING HERITAGE OF THE UPPER OVENS GOLDFIELDS, BEECHWORTH MINING DISTRICT**

Amongst the mountain ranges of North Eastern Victoria lie the hidden ruins of the largely forgotten history of Upper Ovens goldfields. Despite having played a pivotal role in the development of the region, this important history is largely overlooked. Today the diversity in the range of mining ruins can offer us many different experiences. From impressive industrial stamp batteries to simple footprints on a tunnel floor, these places provide us with a wealth of

information.

Of the hundreds of historic mining sites scattered throughout the region, very few have been made readily accessible to the public. Like the early pioneers who saw the many opportunities that the early goldfields offered, today our mining heritage and its range of historic mining sites offer us many opportunities for education, research and tourism - an untapped resource!

**BARRY SYKES**, Historian.

### **THE 1903-4 STRIKE ON THE KORUMBURRA (BLACK) COALFIELDS**

This little-known 15-month strike was the longest in Australia (Australasia?), until eclipsed by the 1918-19 event in Broken Hill, which lasted for 18-months. This latter will not be discussed.

The Outtrim strike was ostensibly caused by the NSW collieries considerably lowering the price of their coal landed in Melbourne during 1902-3, as a result of strikes in their own mines, which had caused them to lose market share in Victoria. The NSW cartel's action caused a flow-on effect, obliging the Victorian companies to lower their prices in order to remain competitive.

They did this by imposing a 30% reduction in the remuneration of all their employees; along with refusing to discuss anything with the miners or their Union (VCMA), which left the miners with no other option but to take industrial action.

This strike dragged on for some 15 months, during which time the Jembunna & Outtrim companies brought in strike breakers, along with large numbers of police. In their heyday these two companies employed around 1000 miners between them, with the Outtrim Company (with 650 'men & boys') being deemed the largest (black coal) mine in Victoria prior to 1903.

Commentators have all claimed that this strike ended in stalemate, because neither side won. It can also be argued that the above two companies also had the hidden agenda of sinking the Miners' Union (VCMA) without trace. The indicators for, and the results thereof, will also be discussed.

**PETER DAVIES**, Research Associate, Archaeology Program, La Trobe University, Melbourne.

### **THE SUPPLY OF WATER TO THE BEECHWORTH DIGGINGS: WATER RACES AND WATER RIGHTS**

The Beechworth district is known for its large-scale hydraulic sluicing operations. This form of gold extraction requires large volumes of water and in this paper we explore how water was supplied. Archaeological evidence demonstrates the use of extensive race networks that tapped directly into groundwater sources, and moved water between catchments. Conflict

over access to water was prolonged and intense, contributing to the emergence of Victoria's first legislation governing water rights.

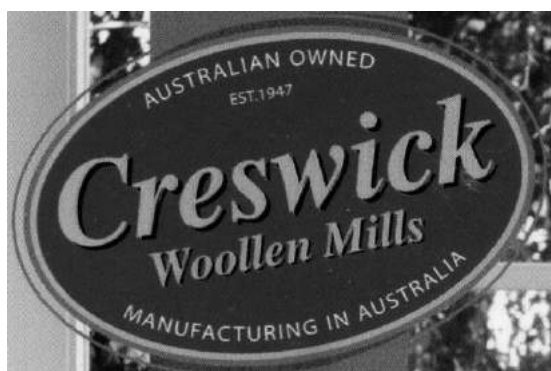
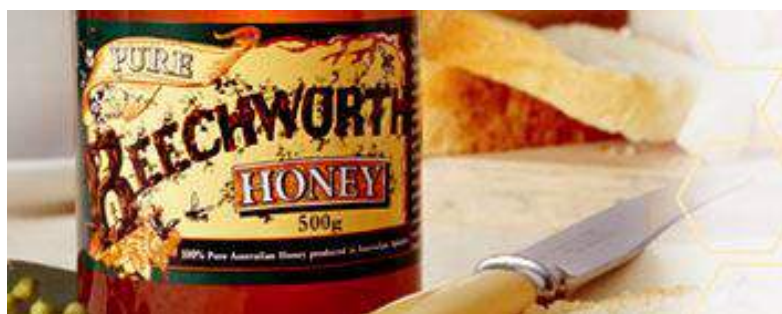
**Dr JANICE WEGNER**, Senior Lecturer in History and Heritage at the Cairns Campus, James Cook University.

### **MINERS AND WEEDS**

When the environmental impact of mining is considered, the focus is usually on pollution, erosion or local deforestation. However, the disturbance caused by any activity in the Australian environment also creates opportunities for weeds. These quiet invaders were brought in by the miners, either accidentally in the case of burrs or deliberately, as economic or garden plants. This paper looks at some of the weed problems that occurred in the wake of the miners and mining towns in Queensland.



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