

**AUSTRALASIAN  
MINING  
HISTORY  
ASSOCIATION**

**PROCEEDINGS  
of the  
24<sup>th</sup> ANNUAL CONFERENCE**



***Rivers of Gold***

**Cromwell, Otago Region, New Zealand  
7-13 October 2018**

**Editors: Lloyd Carpenter and K.G. McQueen**

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**Review Panel**

Brian Hill

Philip Hart

Printed at Lincoln University, Christchurch, New Zealand.

Front Cover Image: 'Electric No. 2 Dredge on the Clutha River just below junction of the Kawarau and Clutha Rivers.' ca. 1900, photograph by J. McEachen.

## Sponsor 24<sup>th</sup> Annual AMHA Conference





## **Presidents Foreword Rivers of Gold**

On behalf of the AMHA Executive and Conference Organising Committee I welcome you to Cromwell for the 24th Annual Conference of our Association. This will be the third conference we have held in *Aotearoa* and I am sure it will be as interesting and rewarding as the previous two.

The theme of this year's conference is *Rivers of Gold*, most appropriate for the Otago region of the South Island of New Zealand, where much alluvial gold has been extracted from the modern and ancient rivers. Gold was known to exist in this area by the Maori and signs were also seen by the early European settlers, but it was the discovery by Gabriel Read at Gabriel's Gully in May 1861 that sparked the first major gold rush in New Zealand. By the end of the year there were 14,000 prospectors on the scene, many of them Australians from the earlier, and by this time, subsiding rushes in New South Wales and Victoria. Following the rush, Dunedin quickly, but briefly, became New Zealand's largest city. Gold mining continues today, with most recent production coming from the Macraes hard-rock deposit. Total gold production from the Otago region is estimated at 265 tonnes.

Cromwell, the venue of our conference, was the second area of Otago to be rushed and remains a substantial modern town, partly moved to higher ground when Lake Dunstan was created. We look forward to experiencing Cromwellian hospitality and the mining heritage of the town and environs as part of our extra-curricular activities. The conference organisers have also organised tours to surrounding sites of mining interest including a full day pre-conference trip to the Macraes operating gold mine and a post-conference trip to the Northburn - St Bathans Blue Lake - Oturehua area. There will also be a host of shorter tours during the conference, to other fascinating and informative mining history sites and museums.

Our annual conferences are only possible with the support and hard work of dedicated individuals and groups. The Organising Committee, consisting of Lloyd Carpenter, Philip Hart and Brian Hill have had the responsibility of planning and organising this conference over the past two years. They have drawn together a program of 21 oral and poster presentations, the majority related to gold mining and goldfield heritage, which promises to be both informative and entertaining.

We also rely on the support and interest of the local community where we hold our conferences, as well as many helpers behind the scene. Special thanks are due to Julie Ward of Lincoln University for organisational assistance, Sheila Carpenter for catering and Bronwyn Carpenter for general assistance. Mel Davies, our tireless Secretary-Treasurer, has provided his usual support and advice. All these efforts and others from within the local Otago community are greatly appreciated.

Our Keynote Speaker this year will be Dr Heather Bachop, formerly of Heritage New Zealand and an expert on the history of the Cromwell area. We also thank her for this important contribution.

I encourage you to enjoy the 24<sup>th</sup> AMHA conference.

**Ken McQueen**

## Conference Program Summary 7-13 October 2018

Day	Times	Activities and Locations
<b>Sunday</b>	10 am-5.30 pm	<b>Pre-conference trip (optional)</b> to Gabriel's Gully and the historic gold town of Lawrence. Meet at Memorial Hall, Cromwell.
<b>Monday</b>	8.30-9.30 am 10.00-4 pm	<b>Registration</b> at Cromwell Memorial Hall <b>Local field trip</b> to Bendigo – Welshtown. Matilda Track, Aurora-Longtown-Pengelly's Track.
	4.30-6.30 pm	Advisory Committee Meeting
<b>Tuesday</b>	8.00-9.00	<b>Registration</b> at Cromwell Memorial Hall.
	9.00-10 am	<b>Opening session</b> Keynote presentation.
	10.00 am-5.00 pm	<b>Presentations</b>
<b>Wednesday</b>	9.00 am-2 pm	<b>Presentations</b>
	2.00 pm-6 pm	<b>Field trip</b> to Gibbston-Arrowtown – Lakes District Museum.
<b>Thursday</b>	9.00 am-1.00 pm	<b>Presentations</b>
	2.00pm-4.00pm	<b>Local Field Trip</b> to Clyde Free walking tour of Clyde Historical Town (brochure included). Meet at the Dunstan Lodge 3pm for a wine-tasting, hosted by Perseverance Wines
	6.00 pm	<b>Conference Dinner</b> Victoria Arms Hotel
<b>Friday</b>	9.15-11 am	<b>AMHA AGM</b>
	11.30 am – 1.00 pm	<b>Presentations</b>
	1.30 pm- 5 pm	<b>Field trip</b> to Bannockburn
<b>Saturday</b>	9.30 am	<b>Field trip (optional)</b> to Northburn - St Bathans Blue Lake.

## Schedule of Presentations

<b>Monday</b>		Field trip to Bendigo Historic Reserve all day
		Evening: AMHA Advisory Group to meet
<b>Tuesday</b>	8.30 – 9.00	<b>Registration</b>
	9.00-9.15	<b>Welcome: Mayor of Central Otago District, Tim Cadogan</b>
	9.15-10.00	Session 1 <b>Keynote presentation - Chair: Lloyd Carpenter</b> <b>Heather Bachop</b> , former senior researcher and writer for <i>Heritage New Zealand (formerly NZ Historic Places Trust)</i> ‘Protecting, managing and telling stories about the heritage of the gold rush: some history and some challenges for the future.’
	10.00-10.30	<b>Morning Tea</b>  Session 2 <b>Otago and beyond – Chair: Nicola Williams</b> ‘Bob and Jules to the rescue’, <b>Rex Johnson</b> ‘One of these ruins is not like the others!’ <b>Lloyd Carpenter</b> ‘The nugget from Nashville 1868: of perseverance and a prince’ <b>John Ferguson and Jim Dugdale</b>
	12.00-1.00	<b>Lunch</b>
	1.00-2.30	Session 3 <b>Discoveries and Rushes – Chair: Peter Bell</b> ‘Approaches to mineral field discovery and development through history’ <b>Ken McQueen</b> ‘The social history of a short rush – Patearoa’ <b>Jim Sullivan</b> ‘Tales of Otagoians on the Klondike’s rivers of gold’ <b>Robin McLachlan</b>
	2.30-3.00	<b>Afternoon Tea</b>  Session 4 <b>Social Histories – Chair: Robin McLachlan</b> ‘Pioneering hotels of Tasmania’s West Coast’ <b>Peter Brown</b> ‘The Dry Creek Saltfields 1936-2015’ <b>Peter Bell</b>  Poster session: <b>Ken McQueen</b> – ‘Rivers of gold and tin: Alluvial mining in the New England region, NSW’ <b>Anne Both</b> - ‘Alice Cornwall – “The Queen of the Australian goldfields”’: A flash in the gold pan’

<b>Wednesday</b>	9.00-10.30	Session 5 <i>Contrasting Experiences</i> – Chair: Ruth Kerr ‘There’s Rust in Them Thar’ Hills’ <b>Rex Johnson</b> ‘Gold, the Great Leveller’ <b>Megan Potiki</b> ‘Two short stays in Old Cromwell: an intersection of hydro-electric development and mining heritage’ <b>Jim Enever</b>
	10.30-11.00	<b>Morning Tea</b>
	11.00-12.00	Session 6 <i>Chinese Miners</i> – Chair: Nic Haygarth ‘A means to an end: Chinese mining technology on the southern New Zealand goldfields’ <b>Neville Ritchie</b> ‘The decline of Chinese gold mining on the Turon goldfields, New South Wales’ <b>Juanita Kwok</b>
	12.00-1.00	<b>Lunch</b>
	1-5.30	Field trip to Arrowtown via Cromwell Gorge Mining Centre
<b>Thursday</b>	9.00-11.00	Session 7 <i>Dredging</i> - Chair: Jim Enever ‘Chatto Creek Dredge’ <b>Rex Johnson</b> ‘John Barry, the capable New Zealander’ <b>Gerald Hutton</b> ‘Why Otago developed the bucket ladder gold dredge and not California’ <b>Nic MacArthur</b> ‘Strakes and ladders: the interchange of bucket dredging people and technology between New Zealand and Victoria, 1898-1928’ <b>Matthew Churchward</b>
	11.00-11.30	<b>Morning Tea</b>
	11.30-1.00	Session 8 <i>Australia and Beyond</i> – Chair Ross Both ‘The New Zealand Mine Plan Project’ <b>John Taylor</b> ‘Artist at the coal face: Perspectives on the Tasmanian mining photos of H. J. King’ <b>Nic Haygarth</b> ‘The Golden Blocks Mine, West Wanganui Goldfield, NW Nelson’ <b>John Taylor</b>
	1.00-2.00	<b>Lunch</b>
	2.00-4.00	Field trip to Clyde. 3.00 – 3.45 wine tasting in the Dunstan Lodge hosted by Perseverance Wines
	6.00	Meal ( <i>separate charge for this</i> ) Talk: ‘My Central: A 50 year

		affair with a goldfield' <b>Lloyd Carpenter</b>
<b>Friday</b>	9.15-11.00	AMHA AGM
	11.00-11.30	<b>Morning Tea</b>
	11.30-1.00	Session 9 <i>Micro-Histories, A mining Queen, and Five Frontiersmen</i> – Chair Philip Hart 'The butcher, the baker and the candlestick maker: The varying fortunes of goldfields merchants; <b>Lloyd Carpenter</b> 'The archaeology of failure: Gold in North Devon (United Kingdom) and the Argentine Smelter (Queensland)' <b>Peter Cloughton</b> 'The Gaffney brothers, building, supplying and hosting Tasmania's west coast mining fields' <b>Nic Haygarth</b>
	1.00-2.00	<b>Lunch</b>
	2.00-4.00	Field trip to Bannockburn

## Australasian Mining History Association Conference – Excursion Details

### **Sunday, 7<sup>th</sup> October** – Pre-conference optional trip

Tour to Gabriel's Gully heritage area and site of the first main gold strike in Otago, 1861. We will also visit Lawrence (near Gabriel's) and the Lawrence Chinese Camp (host Adrienne Shaw, Chair of the Lawrence Chinese Camp Trust). Meet at Cromwell Memorial Hall 9 a.m., ETA return 4:30 p.m. Lunch provided. This is an extensive trip through the old mining areas of Alexandra, Fruitlands, Roxburgh, Ettrick, and Miller's Flat, which is set in some of the most beautiful landscape in New Zealand.

### **Monday, 8<sup>th</sup> October** - Tour to Bendigo Historic Reserve.

Depart via bus to Bendigo Loop Road, where we will use minibuses to ferry conference delegates up to Welshtown. We will complete the Matilda walking circuit, meeting back at Welshtown for lunch, then complete the Aurora circuit after lunch, then using the minivans to ferry delegates back to Bendigo Loop Road for collection on the main bus back to the Cromwell Memorial Hall. There is a Department of Conservation 'long drop' toilet at Welshtown.

Good walking shoes, a sun hat, sunscreen and a water bottle are essential.

### **Wednesday, 10<sup>th</sup> October** - Tour to Arrowtown and Arrowtown Chinese village via Cromwell Gorge Goldfields Centre.

Departing Cromwell Memorial Hall at 1:30 p.m., returning to arrive at 6 p.m.

This trip takes us to a beautiful old goldfields town and tourist centre. There are plenty of opportunities for gourmet coffee and eating experiences, encounters with heritage buildings and a fully restored Chinese village. This is also a free panning area, so if anyone wants to try their luck, all gold pans are available for hire. Bring insect repellent if you are going to do this.

### **Thursday, 11<sup>th</sup> October** - Tour to Clyde historical town.

Departing Cromwell Memorial Hall at 1:30 p.m., returning 4:30 p.m. this delightful old town has missed out on much of the redevelopment that has blighted other heritage regions in Central Otago. It offers a range of buildings and a walking tour of this town is included in the conference publication.

Wine Tasting with Perseverance Wines (<http://www.perseverance.co.nz/>) in the Dunstan Lodge, Main Street, Clyde. Your host is Jennie Hughes, owner of Perseverance Estate.

### **Friday, 12<sup>th</sup> October** - Tour to Bannockburn Historical Reserve.

Departing Cromwell Memorial Hall at 1:30 p.m., returning 4:30 p.m. This is an area of extensive alluvial mining, offering a vast and complex network of water races and old mine sites. Its elevated aspect allows for magnificent views of the Clutha Basin. There are no toilet facilities in this reserve.

Good walking shoes, a sun hat, sunscreen and a water bottle are essential.

### **Saturday, 13<sup>th</sup> October** – Post-conference optional trip tour around Central Otago.

Meet at Cromwell Memorial Hall 9 a.m. This day begins with a visit to the Northburn sluicings, the most extensive and intact herringbone sluicing area in Australasia. This involves a walk of just over 1 km in each direction. Good walking shoes, a sun hat, sunscreen and a water bottle are essential. We will then drive past the Earnsclough Dredge Tailings Historic Reserve, on our way through the old gold town of Ophir thence to Beck's, where we will visit the recently restored goldfields-era White Horse Hotel, finishing at St Bathans, the site of a massive hydraulic elevation mining enterprise. Returning to Cromwell Memorial Hall for 4 p.m.

Each of the sites we are visiting represent some of the most beautiful as well as some of the most historic areas of Central Otago. You are therefore encouraged to bring the best cameras, tripods and any other image-capturing accoutrements that will allow you to show others the details of your incredible stay in Central Otago.

Central Otago, while very sunny, can equally turn very cold. You are advised to bring a good coat and hat, to ensure that you are not caught out.

## **Extended Abstracts**

## **‘The capable New Zealander’: Gerald Hutton**

John Barry

24 Disraeli Street, Westport, New Zealand.

Gerald Hillsdon Hutton was a respected mining engineer with a lifetime of experience in dredge design, construction, operation and management. Gerald was one of the dredging fraternity who left the ‘cradle of gold dredging’ to work in, and promote, the development of the industry overseas. At the time of his birth, in 1883, Dunedin was the hub of a booming engineering industry. Among those enterprises was John McGregor’s Otago Foundry to which the young Gerald Hutton was indentured in 1900. Upon completion of his apprenticeship and marine engineer certification Gerald worked his passage to the United States.

With connections to the mining industry through his engineering training it is likely that Gerald was given an introduction to Robert Postlethwaite, Superintendent of the Risdon Ironworks in San Francisco, and recruited by that Company in 1897 for his New Zealand gold dredging expertise. After two months in the Risdon machine shops Gerald was given the job of dismantling a dredge located north of Anchorage and rebuilding it on the Solomon River, east of Nome. As Alaskan representative of the Risdon Iron Works, he also supervised the construction of three Risdon gold dredges on the Solomon River in 1910.

Gerald returned to Alaska for the 1912 season to install another Risdon machine on the Kougarok River, north-north-east of Nome. The dredging potential of the area must have impressed him for between 1912 and 1914 he and Claus Floden prospected holdings near the mouth of Henry Creek with a view to installing a Union Construction Company dredge. Hutton’s connection with the Union Construction Company was formalised in 1914 when he began a two-year stint as a Company representative. From 1916 until his resignation to join the U S Army engineers, Gerald was superintendent of the Valdor Dredging Company in California. After discharge in 1919 Gerald became a staff engineer of the Metals Exploration Company and in this role was connected with dredging operations in California and Nevada.

In 1928, a time of dramatic corporate and technical changes in the Malayan tin mining industry, Gerald Hutton was appointed a member of the Board of Anglo-Malaya Tin Ltd. and Technical Director of Anglo-Oriental (Malaya) Ltd. This position was the highlight of Gerald Hutton’s career as he was eventually responsible for the technical management of twelve tin dredges. About 1932 Gerald was transferred to Anglo-Oriental Mining Corporation head office in London to assist in the investigation and management of Anglo-Oriental’s interests in British Guiana, the Gold Coast, Nigeria and Australasia. In mid-1940 the Hutton family returned to San Francisco where Gerald was employed by the Inspector of Naval Materials. So far, no details have surfaced of Gerald’s post WW2 activities. Gerald Hutton died in Berkeley, California in 1965.

The author became interested in Gerald Hutton through references to his ability in Clark C. Spense’s ‘The Northern Gold Fleet’. Information sources used in the compilation of this paper include on-line mining journals, especially the Mining & Scientific Press and the Engineering and Mining Journal and archival newspapers. The genealogical website Ancestry.com was also useful. Assistance given by Nic McArthur, Damian Hynes and Gerald Hutton’s great-niece Judi Quest is gratefully acknowledged.

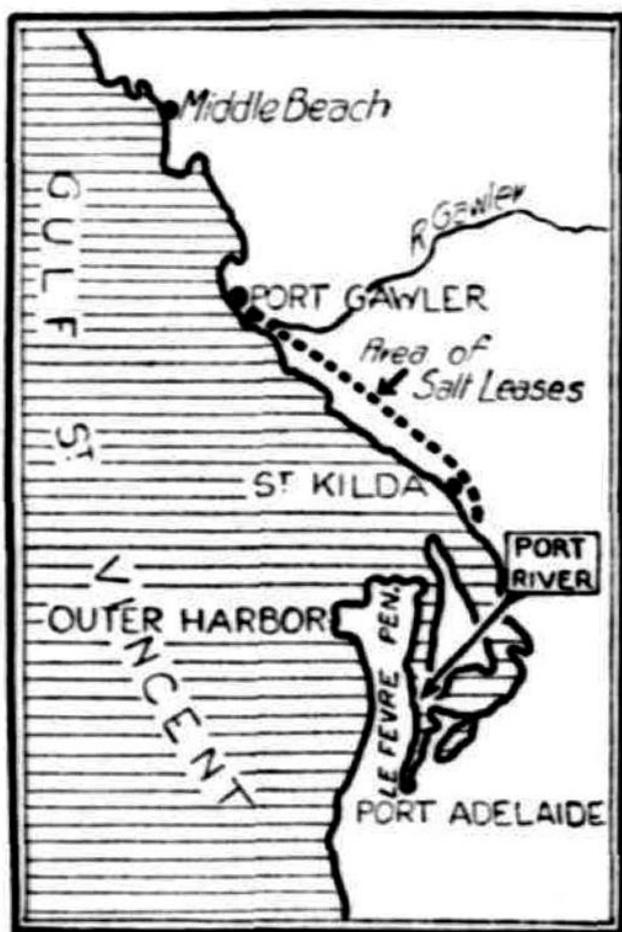
## The Dry Creek Saltfields 1936-2015

Peter Bell

Flinders University, Adelaide, South Australia

Most people think of mining as digging holes in the ground, but it takes many other forms. One is the extraction of minerals, principally sodium chloride, from seawater by evaporation. For nearly 80 years the coastal plain extending north from Adelaide was used for the manufacture of industrial salt by solar evaporation of water from Gulf St Vincent, an era which has recently ended (Figures 1 and 2). Passers-by saw mounds of glittering white crystals in the distance, but otherwise the process was unseen and little known to the public. As an industry, salt-harvesting was remarkably silent, still and unobtrusive, but it made a major contribution to South Australia's industrial development, and to national self-sufficiency in chemical manufacturing.

**Figure 1:** Location map of the Dry Creek Saltfields in South Australia.



Source: South Australian Advertiser.

**Figure 2:** View of the Dry Creek Saltfields.



## Alice Cornwell – ‘The Queen of the Australian Goldfields’: A flash in the gold pan

Anne Both

Burnside Historical Society

In nineteenth century Australia it was not usual for young women of talent to venture beyond the confines of the domestic frontier into financial investment. There were exceptions however, perhaps the most notable of these was the woman known in the press as ‘Princess Midas’ a sobriquet derived from her success in investment and operation of the Sulky Gully Mine at Creswick, Victoria (Figure 1).

Alice Ann Cornwell, born in England in 1852, spent her early life first in Australia and then New Zealand. Her father George established himself as an engineering contractor. In 1869 the Cornwell family returned to Australia taking up residence once more in Melbourne, where George undertook large scale engineering projects, e.g. Jack’s Magazine, Hawthorn Railway Bridge among others. Alice entered society and soon thereafter married John Whiteman MLA, a man many years her senior. After a few years and the birth of one child they separated, and her parents persuaded her to move to England to study music, and also to resume her maiden name.

In 1888 she returned to Melbourne to assist her father in his financial difficulties at the Sulky Gully Mine Creswick, in which he had invested. Thus began her entry into the financial and business world of mining. Although her chief influence was in mine investment through acquisition of numerous leases, she extended her talents to machinery installation and the purchase of patents. She also floated the British Australian Mining Investment Company on the London Stock Exchange, as she said to “simplify mine investment “and to encourage investment in Australian mines.<sup>1</sup> Her interest in mining declined after the early 1890s with hints that all was not as bright as previously reported in the Australian press. The ‘Flash in the Gold Pan’ shifted her interests to dog and cat breeding in the United Kingdom where she remained until her death in 1932.



**Figure 1:** Midas Co. Mine c.1889  
(Formerly Sulky Gully Mine).

Source: Sovereign Hill Gold Museum Collection.

<sup>1</sup> *Mining Intelligence* Launceston Examiner Saturday 26 January 1889 p.6

## Pioneering hotels of Tasmania's West Coast

Peter Brown

PO Box 111, Broadmeadow, NSW, 2292, Australia

It's natural wilderness that attracts 21<sup>st</sup> century tourists to Tasmania's West Coast and earns it the name the 'Wild West'. However, in 1890s it was the behaviour of the people in its fledgling communities that gave it that title.<sup>1</sup> In an echo of the then recent American Wild West, the people at the Tasmanian frontier were painted as rough and lawless.

Like other frontiers, pastoral or mineral, Tasmania's West Coast was remote from established regions and their civilised values. It was easy to think that the men who communed so closely with dirt and mud and too infrequently with soap and civilisation had abandoned many social norms. They did like to drink, often to excess, and found company where they could, normally in the hotels. However, the popular cliché of the energetic, young population, of mostly men, was not well deserved.

At the heart of the mythology of the pioneering mining society are hotels. In every new town like; Zeehan, Dundas, Remine, Queenstown and Strahan; they sprang up like mushrooms after the frequent rains. Photos show imposing two storey buildings surrounded by forest, huts and tents. Men crowd the verandahs and balconies.

They were popular but were these grand edifices an elaborate ploy by greedy publicans to seduce prospectors, miners and idlers and separate them from their earnings? Many thought so.

To find out we follow the twin towns of Zeehan and Dundas over about ten years. In 1891 Zeehan was well on its way to success, only needing a railway to link its riches of lead and silver to the world. Many said that Dundas would exceed its neighbour. By 1901, the mineral fields were defined and calamities like wildfire and economic depression had been endured.

Like the miners, the pioneering publicans were attracted by the promise of rich rewards. Generally, they did do very well in the brief period when the half-formed town was a poorly served cluster of prospectors' tents and huts. They had a substantial captive market of miners who desperately needed food, shelter, liquor and social interaction. For the prospectors and miners, the hotels were a small seed of civilisation in the wilderness. They were also a safe and comfortable place for businessmen, speculators and investors who wanted some part of the mineral booms.

Although the hoteliers were motivated by money they went well beyond purely financial motivations. They nurtured their communities, encouraged social cohesion, provided charity and looked to the greater needs of developing towns. Generally, publicans performed many civic duties and helped turn their rough communities into civilised towns.

For many running a hotel was a vocation that they took from hotel to hotel, from town to town and from mining field to mining field. The men and women who ran the pioneering hotels were not greedy and exploitative, they were an essential part of their community.

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<sup>1</sup> Wilberton Willey, *The Wild West of Tasmania*, Evershed Brothers, Zeehan and Dundas, 1891.

## One of these ruins is not like the others

Lloyd Carpenter

Faculty of Environment, Society and Design, Lincoln University, New Zealand

The historic reserve at Bendigo is a spectacularly beautiful place of stone ruins, abandoned cottages and mining machinery foundations scattered across a quintessential Central Otago landscape of tussock grass and schist outcrops. The reserve's dusty hills and gullies are pockmarked by adits, prospecting shafts and mullock piles in mute testimony to the nineteenth century miners' pursuit of gold. It is a place with layers of mining history, featuring distinct areas which reveal the progression from individual creek-bed miners to the sluicing syndicates of the Aurora and Rise & Shine, the quartz men of the Cromwell, Reliance and Colclough Companies and finally the Bendigo Gold Light Dredge of the 1930s.

Among the abandoned schist stone cottages, houses and huts is one atypical ruin, the remains of what was obviously a very substantial house (Figure 1). Unlike other structures which have given way, tumbling down under the assault of the extremes of the Bendigo climate, it shows signs of being deliberately wrecked – and not by modern vandal visitors.

This house ruin is evidence of a bitter industrial conflict which tore the small Central Otago community apart, featuring scenes reminiscent of the Highland Clearances with armed police, the destruction of houses and the eviction of families. It was the first New Zealand dispute to escalate into a site-wide strike and lock-out.

I will locate this exceptional ruin in the narrative of Bendigo, revealing it as the legacy of the divisive events of 1881.

**Figure 1.** The atypical ruin at Bendigo, Central Otago.



Source: Photograph Lloyd Carpenter.

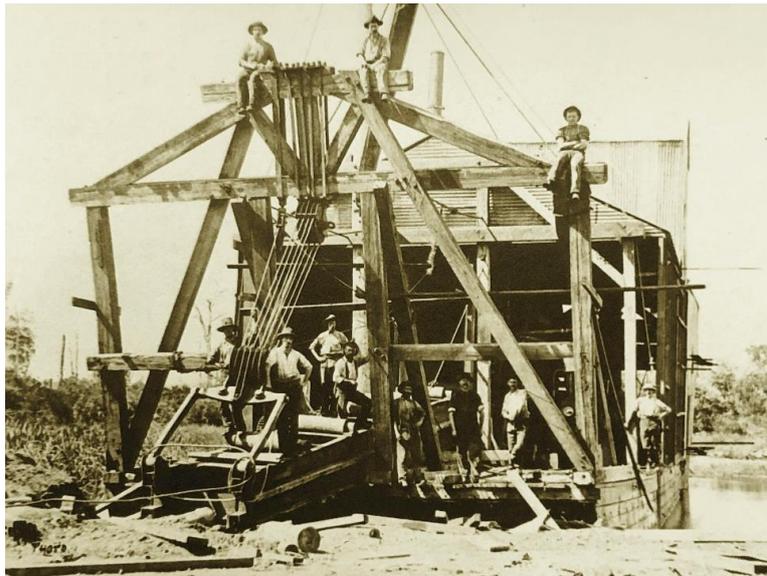


## Strakes & ladders: The interchange of bucket dredging people and technology between New Zealand & Victoria, 1898-1928

Matthew S. Churchward<sup>1</sup>

<sup>1</sup>Senior Curator, Engineering & Transport, Museums Victoria

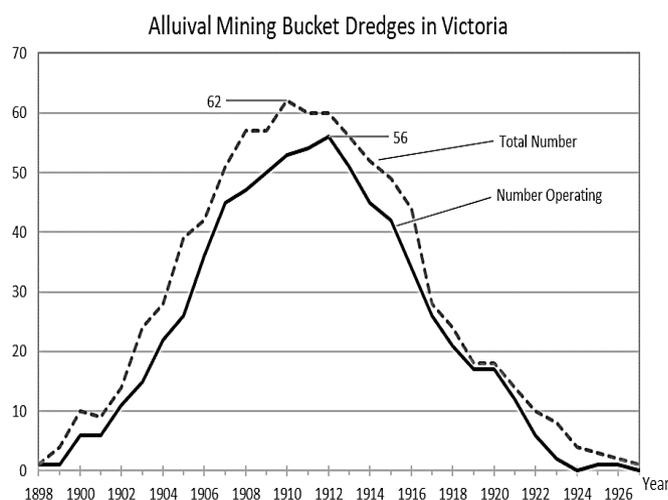
The steam-powered bucketing dredging era of alluvial mining in Victoria began in 1898, inspired by the emergence of the technology in New Zealand a decade earlier. By 1895 a speculative dredging boom in Otago and Southland had firmly establishing the reputation of the great southward flowing waterways of the Clutha and its tributaries as *'Rivers of Gold'*.



Source: Bright & District Historical Society

**Figure 1:** Erecting the Barwidgee Bucket Dredge, Myrtleford, Victoria.

While capital and equipment were initially primarily sourced locally, Victorian dredging companies relied from the outset on New Zealand dredge designs and the recruitment of skilled New Zealand dredge masters, winch operators and dredge hands. Early experience showed that equipment designed to operate in the deep fast-flowing rivers of central Otago was not entirely



**Figure 2:** Alluvial Mining Bucket Dredges in Victoria, 1898-1928

suited to conditions in Victoria and significant adaptations were required before the industry achieved its first success. Once dividends began to flow, a speculative dredging boom also took hold in Victoria, fed ironically by the inflow of capital and cheap second-hand dredging plant that became available following the collapse of the New Zealand boom in 1903. At this point Isaac Stevenson, partner in the Port Chalmers engineering firm of Stevenson & Cook, emerged as a key player shaping the industry in Victoria and in 1908 formed a partnership with Chas Ruwolt, of Wangaratta, to again build dredges locally.

The relationship between the New Zealand and Victorian bucket dredging industries, was more than a simple one-way flow of capital, technology and people.

## **The archaeology of failure: Gold in North Wales and North Devon (United Kingdom), and the Argentine Smelter (Queensland).**

Peter Cloughton

Department of History, University of Exeter, UK

This presentation will bring together some aspects of mining and ore processing archaeology which highlight that it is not always the successful enterprises which leave their mark: there are also the failures!

In the early 1850s, driven by the spectacular discoveries in California and south-eastern Australia, there were searches made for gold across England and Wales and some viable deposits were found, particularly in the area around the Mawddach estuary in north-west Wales. Those discoveries then stimulated trials across north Wales, and parts of south-west England where gold had been identified as early as the late 18th century. This in turn provided a market for gold processing machinery - some of which failed to come up to expectation. Three sites, one in North Wales and another two close to North Molton in North Devon, are examined for evidence of gold processing and its failure to produce the expected results.

On a similar trend, the boom in silver production in eastern Australia in the 1880s stimulated searches for that metal across both New South Wales and Queensland, with a range of smelting processes being used to treat the ores on site. One of those sites, at Argentine in the hinterland to Townsville, was a total failure. The initial firing of the smelter was abandoned, with the partially smelted charge still remaining in the furnace. Using archaeo-metallurgical techniques, samples of slag from that furnace have been examined to try and understand what went wrong and why the attempt to smelt the ores at Argentine failed.

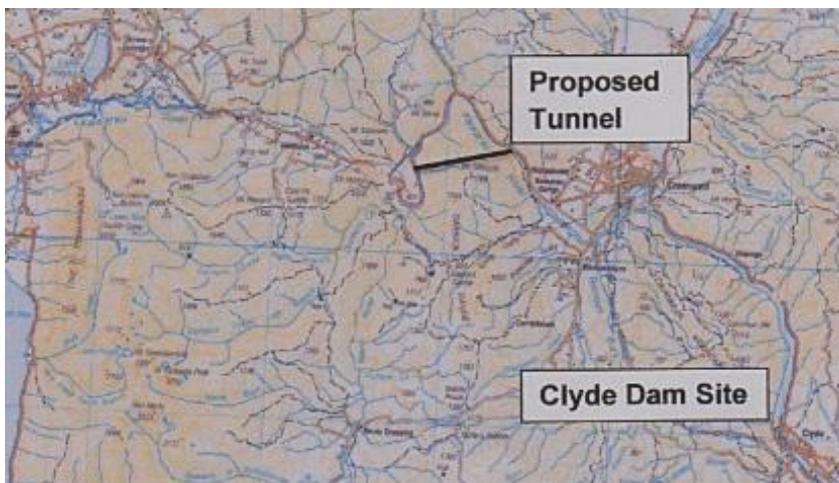
## Two short stays in Old Cromwell: An intersection between hydro-electric development and mining heritage.

Jim Enever

CSIRO, retired

In the early 1980s, two hydro-electric projects were under construction or planned for the Cromwell area with the potential to intersect with the mining heritage of the district. The construction of the high dam on the Clutha River at Clyde, downstream of Cromwell, threatened to flood an array of mining heritage sites along the banks of the Clutha and Kawarau Rivers, as well as the historic gold mining town of Cromwell at their junction. By 1983, work on the dam was underway when CSIRO was asked to make a geotechnical assessment of potential seismic activity on a branch of the Dunstan Fault, which had been found to pass through the dam site. The results of testing at the dam site ultimately contributed to the choice of an innovative design for the structure to mitigate against the impact of any activity along the fault should this occur. In anticipation of the filling of the dam, the NZ government instigated, in 1977, a comprehensive archaeological study with the aim of surveying and assessing as many of the mining heritage sites under risk of inundation as possible.<sup>1</sup> The results of this survey have been used as input to the preservation of Central Otago's gold mining heritage.

In 1984, planning was underway for the 'Kawarau Power Development', aimed at diverting the water of the free running Kawarau River through a tunnel to a power station located on the river downstream of the tunnel, incidentally cutting off a major bend of the river. CSIRO was again asked to contribute to the geotechnical investigation by conducting tests in a pilot adit, excavated near the downstream end of the tunnel, results to be used as input to the final excavation design. In the event, the project did not go ahead, due largely to public outcry at the prospect of removing the flow from a significant section of the river. If the project had have gone ahead, it would have mimicked past attempts to do the same thing, aimed at exposing the bed of the river to allow recovery of the rich gold deposits thought to be present.<sup>2</sup>



**Figure 1:** Location of the Clyde Dam and proposed diversion tunnel.

<sup>1</sup> Neville A. Ritchie, 'The Clutha Archaeological Project, 1977-1987', Summary Report, NZ Historic Places Trust.

<sup>2</sup> James C. Parcell, 'Heart of the Desert, Being the History of the Cromwell and Bannockburn Districts of Central Otago', Otago Centennial Historic Publications, 1951.

## The nugget from Nashville 1868: Of perseverance and a prince

John E. Ferguson<sup>1</sup> and Jim S. Dugdale<sup>2</sup>

<sup>1</sup> Glasshouse View Court, Buderim, Qld. 4556

<sup>2</sup> Eel Creek Road, Gympie, Qld. 4580

On 6<sup>th</sup> February 1868, Valentine Curtis Brigg unearthed a gold nugget in Sailors Gully at Nashville on the Gympie Creek Diggings (the young Mary River Goldfield), on a claim operated by George Curtis.<sup>1</sup> By 6<sup>th</sup> April 1868, the nugget had journeyed to Maryborough, Brisbane and Sydney to be melted down at the Royal Sydney Mint. While referred to as ‘Gympie Creek’, ‘Monster’, ‘Curtis’, ‘Prince Alfred’ and ‘Perseverance’ nugget, George Curtis is reported as proposing the latter name.<sup>2</sup> Nashville soon morphed into Gympie.

With a nett weight of 906 ozs., this nugget remains the largest found in Queensland.<sup>3</sup> While no formal description was made, nor any image yet found, press comments imply a size ranging from 14x8 to 8x5x1 inches and an in-situ position close to a rocky surface. The current terminology for this country rock is the Pengelly Siltstone, a graphitic siltstone of Permian age.<sup>4</sup> In close proximity to the discovery site, quartz reefs, e.g. the Lady Mary and Caledonia, yielded bonanza grades of gold.

On about 18<sup>th</sup> March, 1868<sup>5</sup>, the nugget was privately shown to the visiting Prince Alfred, Duke of Edinburgh, in Sydney. This allows speculation that a Lord Newry, artist/photographer present on the day<sup>6</sup>, may have recorded the event and an image of the nugget remains undiscovered.

The presentation will make some comparisons between features of some other nuggets and large masses of gold.

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<sup>1</sup> Maryborough Chronicle, 8<sup>th</sup> February, 1868; Morning Bulletin, Rockhampton, 8<sup>th</sup> August, 1929; Record books wrong, says man seeking name change for nugget, QGMJ, 10<sup>th</sup> April, 1993; Memoirs of a Queensland Pioneer, Nugent Wade Brown, Mimeographed Brisbane, 1944, p 35-37.

<sup>2</sup> Illustrated Sydney News, 20<sup>th</sup> April, 1868, p 356; and Maryborough Chronicle, 15<sup>th</sup> February, 1868.

<sup>3</sup> Australia’s Large Nuggets, Gold and Civilization, 2001, p 31.

<sup>4</sup> Stidolph P.A., Dugdale J.S. and von Gnielinski F., 2016. Stratigraphy, Structure and Gold Mineralisation in the Gympie Group at Gympie, Queensland. Queensland Geological Record 2016/05.

<sup>5</sup> The Sydney Empire, 19<sup>th</sup> March, 1868.

<sup>6</sup> The Prince and the Assassin: Australia’s first Royal Tour and Portent of World Terror. Steve Harris, Melbourne Books, 326pp., 2017.

## Artist at the coal face: Perspectives on the Tasmanian mining photos of H. J. King

Nic Haygarth

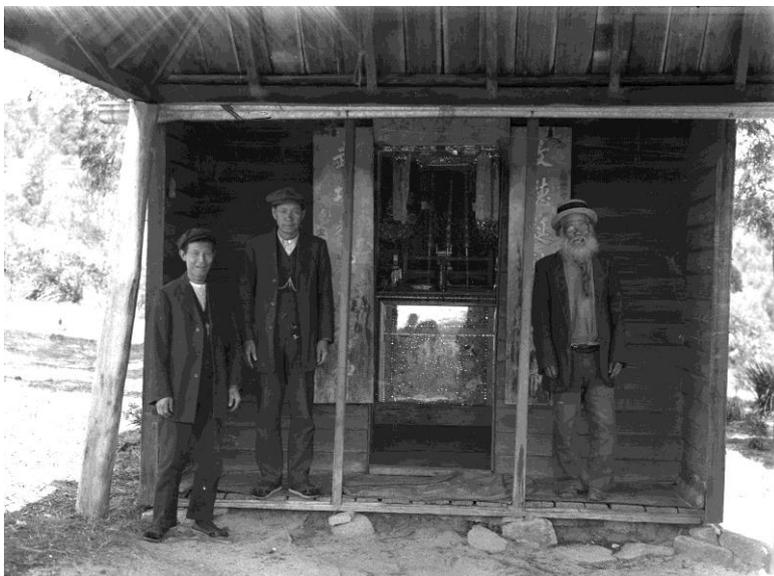
Associate, University of Tasmania

Herbert John King (1892–1973) was such a lead-foot that he earned his first speeding caution as a twelve-year-old—on a bicycle. The Launceston motorcycle mechanic was also crazy about cameras. On a motorcycle trip through Tasmania's north-eastern tin fields in 1914 King catalogued the people and the technology, capturing the only known images of the Chinese tin-mining village of Garibaldi, including perhaps the only photo of a Tasmanian joss-house in situ; snapped the buddles in the Anchor tin mine plant; the monitors blasting the faces of the Briseis mine; and found a bird's eye view of the dredges working the Pioneer mine.

When King married in 1918, he chauffeured Lucy his bride across the state in the sidecar of his Indian, using her as a human scale in his bush and mining field landscapes. When parenthood limited his outings, in 1921 he abandoned the Indian motorbike and took to the skies with ex-World-War-One daredevil pilot, Captain Fred Huxley. Now he could cover even more territory much faster. Devising a specialty camera in order to complete the first aerial survey of an Australian city, King shot hundreds of images from 1000 metres through a hole in the floor of Huxley's single-engined Sporting Farman bi-plane.

Today King's glass plate negatives are being revealed in their full glory for the first time. For the historian they freeze thousands of moments in time: molten slag spilling into banana carts from the Mount Lyell converters, while skip tracks snake down into the Iron Blow; the Grubb Shaft Engine House being devoured by the Tasmania gold mine at Beaconsfield; shale oil works retorting on either side of the Mersey River; a Garratt locomotive hauling ore beneath Montezuma Falls on the narrow-gauge North East Dundas Railway. Perhaps it took a petrol-head to really infuse the visual record with the sounds and smells of the industrial frontier.

**Figure 1:** Joss house at Garibaldi, north-eastern Tasmania, 1914, by H.J. King.



Source: Queen Victoria Museum and Art Gallery, Launceston.

## Frontiersmen five: The Gaffney brothers, building, supplying and hosting Tasmania's west coast mining fields

Nic Haygarth

Voluntary Associate, University of Tasmania

The five Gaffney brothers, James, John, Michael, Frank and Steve, were at the forefront of virtually every mining settlement on Tasmania's west coast in the pre-World-War-One era. Butchers, drovers, storekeepers, hoteliers, builders, sawmillers, packers, farmers, plus freight, passenger, mail and road contractors—they were jacks of all trades who almost rode in the prospector's pocket. Irish Catholic scions of the farming community of Deloraine, they had an uncanny ability to beat all comers to the latest mining hotspot. Even the enticingly-named Moores Pimple had a pop-up Michael Gaffney (1864–1934) store.<sup>1</sup>

The mantle of most enterprising brother belongs to either the first or the last. James Gaffney (1853–1913) went from being a tin miner at Mount Bischoff to fronting—with Frank Harvey—the best-known contracting firm on the west coast. They probably built as many hotels as they licensed. Frank Gaffney (1867–1928) and business partner James Leach drove fat stock from north-western Tasmania across the highlands and down the west coast to be butchered at Gormanston and Zeehan. Later he was so dominant in Balfour's commercial life that he fielded complaints of monopolisation from customers and competitors alike.<sup>2</sup> In truth he was just sharper than the rest.

Things didn't always go to plan. Being 'hands on' could also be dangerous. In May 1913 Frank Gaffney almost lost his life packing tin across a flooded river mouth, the non-swimmer surviving by clutching the tail of his beloved horse Bluey, the only one of his three beasts to make it ashore.<sup>3</sup> Steve Gaffney (1869–1940) was bankrupted while storekeeping at Queenstown and hotel keeping at Linda—but bobbed up again at Williamsford and Balfour.<sup>4</sup> One of Steve's creditors, James Gaffney, almost sank with him even while serving as Legislative Council Member for Lyell.<sup>5</sup> Worse yet, in 1887 the Supreme Court threw out James' bid to snatch a share in the Mount Lyell Iron Blow from a drunken James Crotty—depriving the eldest Gaffney of a fortune.<sup>6</sup>

It was not until 1924 that, with the departure of John Gaffney (1857–1927) from Strahan, the brothers took their leave of the western frontier.<sup>7</sup> Almost a century on, this paper traces the Gaffneys' careers, seeking the secrets of their dominance. It considers their operating methods both individually and as a family unit, their achievements and the surviving physical legacy of their careers.

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<sup>1</sup> 'Mount Reid and King River gold-fields', *Launceston Examiner*, 4 June 1892, p. 2.

<sup>2</sup> See, for example, 'Balfour Correspondent', 'Klondyke prices', *Circular Head Chronicle*, 9 June 1909, p. 2.

<sup>3</sup> 'Tin miner's narrow escape', *Mercury* (Hobart), 31 May 1913, p. 4.

<sup>4</sup> SC84/1/120 (Tasmanian Archive and Heritage Office),

[https://libriestas.ent.sirsidynix.net.au/client/en\\_AU/all/search/results?qu=gaffney&qf=FORMAT\\_LINCTAS%09Format%09Online%09Online](https://libriestas.ent.sirsidynix.net.au/client/en_AU/all/search/results?qu=gaffney&qf=FORMAT_LINCTAS%09Format%09Online%09Online), accessed 2 September 2018.

<sup>5</sup> SC84/1/184 (Tasmanian Archive and Heritage Office),

[https://libriestas.ent.sirsidynix.net.au/client/en\\_AU/all/search/results?qu=gaffney&qf=FORMAT\\_LINCTAS%09Format%09Online%09Online&rw=12&isd=true#](https://libriestas.ent.sirsidynix.net.au/client/en_AU/all/search/results?qu=gaffney&qf=FORMAT_LINCTAS%09Format%09Online%09Online&rw=12&isd=true#), accessed 2 September 2018.

<sup>6</sup> 'Courts: Supreme Court', *Daily Telegraph*, 24 August 1887, p. 3.

<sup>7</sup> 'Men and women', *News* (Hobart), 28 October 1924, p. 4.

## **Otago Goldfields heritage in three short films**

Rex Johnson

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This contribution will be in the form of some short films, highlighting different heritage aspects of the Otago Goldfields. The plan is to view the films and viewed at different times during the conference.

### **The Chatto Creek Dredge**

After spending many years lying forgotten in the Manuherikia River, an Alexandra group recovered much of the Chatto Creek dredge remains and shifted its wooden hull out of the river onto the riverbank. In March 2013 the Otago Goldfields Heritage Trust arranged for all the dredge remnants to be relocated into a heritage reserve created behind the Chatto Creek Tavern.

This presentation is based on a 15-minute movie which reviews the history of the dredge during its epic move up the Manuherikia River, along the Otago Central Rail Trail, and into its last resting place behind the tavern.

### **There's rust in them thar' hills**

A hiker explores remote valleys near Macetown and locates some beautiful rusty goldfields stamper batteries. In a burst of passion, the hiker aims to identify remnant parts and deduce the workings or operations of the stampers and the mine sites. Four sites are visited and discussed. Three of these sites are rarely visited by the public.

The hikers untrained interpretation efforts are shown in a 15-minute movie, in which the identity and location of the sites is revealed.

### **Bob and Jules to the rescue**

A somewhat 'shaggy dog yarn' perspective of Bob and Jules, the development of their joint career and their impact on the Central Otago goldfields, and in particular, the Bendigo area.

This yarn is supported by a 6-minute movie of one aspect of their goldfields work, in which the commonly known names of Bob and Jules is revealed.

## The decline of Chinese gold mining on the Turon goldfield, New South Wales

Juanita Kwok

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When the *Sydney Morning Herald's* reporter visited the Turon River in 1865, he found a gold mining population of at least 600 Europeans and 2000 Chinese who dominated the riverbed:

For a length of over 25 miles the bed of the river is now being worked at every spot that offers the slightest prospect of success and for the greater part of the distance, more particularly up the river from Sofala, it is completely seamed with races. In fact the whole of the water of the river is entirely diverted from its bed, and you may cross it almost anywhere bare-footed.<sup>1</sup>

By 1871 this had changed. When the English writer Anthony Trollope visited Australia in 1871 and toured the gold fields, he stopped at Sofala, which he described as 'now a poor little town, consisting of 644 inhabitants, of whom a considerable portion are Chinese...'<sup>2</sup>

Between 1861 and 1871, the population of the town of Sofala fell from 1,646 to 644 and the number of Chinese males in the town fell from 642 to 81.<sup>3</sup> The total population of the Sofala Registry district declined from 4460 in 1861 to 2821 in 1871, but the Chinese population declined at a much sharper rate from 1877 to 507.<sup>4</sup>

What caused the mining population, especially the Chinese miners, to leave the Turon between 1865 and 1871? In this paper, I consider various reasons for the departures, arguing that the departures of alluvial miners, particularly Chinese miners, was chiefly due changes to gold field regulations beginning with the *Gold Fields Amendments Act 1866*.

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<sup>1</sup> 'Random Notes by a Wandering Reporter XXIV.' *Sydney Morning Herald*, 30 September, 1865, viewed 13 August 2018, URL: <https://trove.nla.gov.au/newspaper/article/31125454>

<sup>2</sup> Anthony Trollope, *Trollope's Australia" A Selection from the Australian Passages in "Australia and New Zealand"* (Melbourne: Thomas Nelson, 1966; repr., 1966), 125.

<sup>3</sup> New South Wales Government, Census of NSW 1861 - Nationality of the People, (Sydney: Historical Census and Colonial Data Archive 1861), [http://hccda.ada.edu.au/pages/NSW-1861-census-05\\_585](http://hccda.ada.edu.au/pages/NSW-1861-census-05_585); *Census of NSW 1871 - Nationality*.

<sup>4</sup> Census of NSW 1861 - Nationality of the People, (Sydney: Historical Census and Colonial Data Archive 1861), [http://hccda.ada.edu.au/pages/NSW-1861-census-05\\_118](http://hccda.ada.edu.au/pages/NSW-1861-census-05_118); *Census of NSW 1871 - Nationality*.

## Why Otago developed the bucket ladder gold dredge and not California

Nicol Allan MacArthur

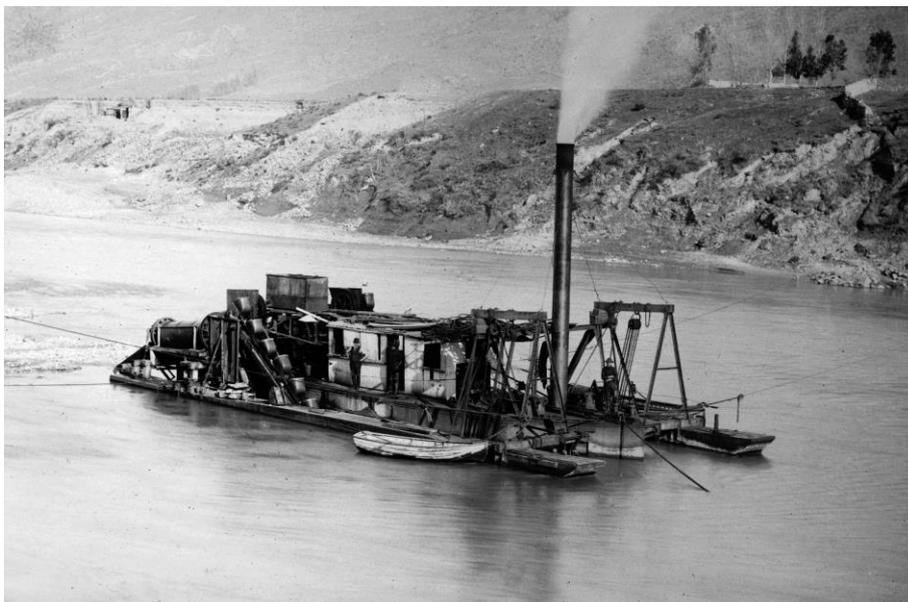
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The world's first effective gold dredge appeared on the Clutha River in 1881 utilising steam power and continuous bucketline digging. Enhancements for pond dredging and tailings stacking maximised its capabilities, determining it as one of just seven 'macro-inventions' that transformed nineteenth century mining into a bulk industrial activity. Known as 'the New Zealand gold dredge' it rapidly found application worldwide. Why did this superior technology emerge in isolated pastoral Otago and not in the industrialised United States, which contained more and larger dredging resources?

Contiguity, claim ideology, and the nature of local expertise are revealed as diagnostic factors. Otago's dredging ground was concentrated along the Clutha River; occurred in politically small claims; and practicably close, a cluster of shipbuilding and gold mining engineering facilities around Dunedin provided uniquely appropriate services. The resulting several projects, knowledge sharing, and cumulative operating experience led systematically from the spoon dredge to the New Zealand gold dredge. America demonstrated the opposite: the dredging ground occurred dispersed across the West in huge monopolistic claims; the engineering services lay far distant in the industrial east; and favoured land earthmoving equipment. After starting two decades before Otago, American developments proceeded sporadically and individualistically, entering many blind alleys before adopting the bucket ladder dredge a decade after it emerged in Otago.

More than explaining why the gold dredge emerged in Otago, these findings add a world-class innovation to Otago's industrial history. Of wider significance, the paper shows that a large industrial base was not always necessary for significant technological innovation, and it challenges narratives of American technological supremacy.

**Figure 1:** The Dunedin, the first fully engineered steam dredge in New Zealand.



Source:  
Hocken Collection  
University of Otago,

## Tales of the Otagonians on the Klondike's rivers of gold

Robin McLachlan

Charles Sturt University, Bathurst, NSW, Australia

Otago was well represented in the Klondike Gold Rush of 1897-99, with Stampeders coming from Dunedin on the coast through to Otago's inland communities and gold fields. In this paper we will accompany Otagonians to the Klondike and share their luck in the search for gold. Through letters sent home to friends and family, together with New Zealand and Canadian newspapers and archival records, we are able to recount their Klondike experiences in some detail. A published diary offers an especially useful insight into the story of William Hiscock.<sup>1</sup>

William Hiscock and Bert Scheib will be our chief guides for the journey over the passes and down the Yukon River, with flora and fauna observations offered en-route by Bill McCormack (Otago Acclimatisation Society). Accounts of work and life on the Klondike will be provided by several pens (or pencils if the weather is freezing). Only a few, William Pacey among them, will find their golden reward, while many more will return home perhaps richer in experience but not in pocket. Archie Christie though may have struck luck later with his "Klondyke Tea" venture in hometown Gore. A handful will stay on to make a future life in Canada, happily so for Klondike newlyweds John and Agnes Cormack. Alas, Canada will not offer a happy future for two of their Otago compatriots. Herbert Herbert will have a tragic encounter with a one-legged Scotsman, while the fate of James Johnson could have been taken from a Jack London story.

Collectively, the experiences of the Otago contingent offer a surprisingly comprehensive account of the Klondike Gold Rush, while individually revealing the diversity of characters shaping the history of both the Klondike and the wider Otago region in the late 19<sup>th</sup> century.

### *A list of Otagonians who took part in the Klondike rush*

J. Boyle (Gore)  
 \*Archibald Christie (Gore)  
 John Cormack (Roxburgh)  
 Ted Gauchet (Alexandra)  
 Bernard Ginsberg (Nenthorn)  
 Herbert G. Herbert (Dunedin)  
 Robert Hicks (Tuturau)  
 William Hiscock (Roxburgh)  
 James Johnson (Skippers)  
 Adam Jowitt (Clutha)  
 William McCormack (Tapanui)  
 \*Jim McKenchie (Gore)  
 D. Miller (Queenstown)  
 William Pacey (Alexandra)  
 Albert Scheib (Cromwell)  
 \*William Smaill (Gore)  
 Agnes Spiers (Roxburgh)  
 John Newton Storry (Lawrence)  
 M. Wood (Clyde)

(\*Went to the Atlin Rush, northern B.C., via the Klondike Trail, 1898)

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<sup>1</sup> Francis William Hiscock, *A Kiwi in the Klondike: Memories from the Diaries of Francis William Hiscock*. Stella M. Hull, Waiuku, N.Z., 1993.

## Approaches to mineral field discovery and development through history

Ken McQueen

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Throughout mining history there have been various approaches to mineral discovery and mineral field development. The different approaches reflect the evolution of economic, socio-political and management structures, as well as changes in the science of ore discovery and mineral-related technology. Common features can be recognised that allow these approaches to be grouped into five key models. The models represent end members and elements of more than one model appear in the history of some mineral fields. Historical development of the models has not strictly followed a linear progression, although some have been more in vogue at particular times. The five models can be summarised as follows.

**1. The ‘Casino’ model.** In this model discovery is by basic observation, guided by analogy with known mineral deposits and environments. Development is typically small-scale, low-tech and commonly reliant on perseverance or luck for success. There is little understanding or regard for the environmental impact of mining. Examples include the alluvial gold rushes of the 19<sup>th</sup> Century and modern artisanal mining in third world countries.

**2. The ‘Emperor’s New Clothes’ model.** This model is characterised by either fortuitous or directed discovery, in some cases, needs-driven. Development is by a central authority with crown or state funding. In some cases development and production are subsidised for strategic or social purposes. There may be consideration of the environmental impact of mining through the central authority. Examples include the mines of Laurion in ancient Greece, the crown-owned silver mines of Kongsberg and state-operated mines in the former Soviet bloc.

**3. The ‘Bootstrap’ model.** Discovery in this model is typically by systematic prospecting of new frontiers, as well as areas of known mineralisation. Discovery is followed by staged development using funds generated from the resource itself, and often relying on early mining of high-grade ore. Generally there is no, or limited, consideration of the environmental impact. Examples include a number of mining fields developed in Australia during the 19<sup>th</sup> Century, such as the Barrier Ranges silver-lead field and some gold and copper deposits.

**4. The ‘Safari’ model.** The Safari model features location planned discovery and development by well established and capital funded groups, using scientific methods and knowledge of global geology. The level of control on environmental impact is variable, depending on location and local regulation. Examples include exploration and mine development by companies and consortia in the 19<sup>th</sup> Century colonial era and during the 1960s mineral boom in Australia.

**5. The ‘Sustainable Planet’ model.** This model involves discovery within a global context using rapidly evolving exploration technology, the exponential increase in Earth system knowledge and digital data management methods. Development requires major and long-term capital funding and is guided by a need for more sustainable resource use and social licence. The model is characterised by an increasing level of government regulation, as well as public awareness and scrutiny, particularly related to environmental impact. Examples include ‘big mining’ by global companies, (e.g. BHP-Billiton, Riotinto, Vale), as well as the activities of smaller players ‘below the radar’ in developing countries.

These models provide a framework for recognising and understanding different approaches to mineral discovery and development that could better inform and clarify mining history.

## **Rivers of gold and tin: Alluvial mining in the New England region, NSW**

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The New England region of New South has been a significant producer of gold and tin, particularly prior to 1914. Much of the gold and most of the tin has come from alluvial deposits concentrated during weathering and extensive erosion of numerous, small or low-grade primary deposits associated with the widespread granites of the region. The alluvial deposits were found in the recent drainage, but also in buried deep leads. Production of alluvial gold exceeded 21.5 tonnes (691,120 ozs) and that of tin more than (as tin oxide concentrate) 200,000 tonnes.<sup>1</sup>

Gold discovery in New England was prompted by the first gold rushes to the Bathurst area of central New South Wales in the autumn of 1851. Fearing loss of business from an exodus to these diggings, reward committees were set up by local businessmen to promote the discovery of gold in the Hunter River and New England areas. In September 1851 gold was discovered at Swamp Oak Creek, tributary to the Peel River 24 km east of Tamworth. Subsequent discoveries followed rapidly. The most important alluvial fields were along the Peel River and at Nundle and Hanging Rock, at the Rocky River (Uralla) and on the Timbarra River (east of Tenterfield).

At Rocky River, early mining was along the course and tributaries of the river for 7.6 km, but in 1856 Thomas Jones, or possibly his wife, found the first gold-bearing deep lead beneath a basalt hill east of the river. Other deep leads were found in the surrounding area, including at Mts Welsh, Harris, Brisbane, Beef, Mutton and Marsh and at Tipperary Hill, Doherty Hill and Sydney Flat. These deep leads in buried Tertiary valleys were richer than the recent alluvial deposits, resulting in a major revival of the Rocky River field. In the period 1856-1860, 120,000 oz of gold were produced, mostly from deep lead mining. Near the end of 1856 the population of the field peaked at 3,500, including 2,500 miners. From 1857, parties of Chinese miners began arriving at Rocky River and they contributed significantly to later production.

The earliest discovery of tin in the New England region is shrouded in mystery. In 1873, James Daw claimed he had found tin on a tributary of the Severn River in 1849. W.B. Clarke reported the occurrence of alluvial tin with gemstones in the catchment of the Macintyre River during his exploration of the northern goldfields in 1853. These and other early discoveries were not followed up until 1871-1872 when large exploitable deposits of alluvial and reef tin were discovered at Elsmore, Oban, Tingha, Vegetable Creek (Emmaville) and Stannifer in northern New England, and at Stanthorpe across the present Queensland border. Cornelius McGlew was instrumental in promoting the early discoveries at Elsmore and Stanthorpe. One of the most important finds, made by Thomas Carlean a piano tuner, was at Vegetable Creek. Here early mining was focussed on a shallow alluvial lead in the swampy valley, but later the famous Vegetable Creek deep lead was discovered to the west, beneath basalt lava flows.

An interesting aspect of tin mining in New England was the involvement of large numbers of Chinese miners, many of whom had previously worked on the alluvial goldfields. Between 1877 and 1890 more than 3,000 Chinese worked on the New England tin fields.

After 1900 many of the alluvial gold and tin fields were worked and re-worked by hydraulic and bucket dredging, using technology first developed and perfected in the New Zealand goldfields.

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<sup>1</sup> References relevant to this article are listed in K.G. McQueen, 2018. Mining history of the New England Region 1:750 000 Scale Metallogenic Map. Geological Survey of New South Wales, Maitland, NSW, Australia.

## Gold, the great leveler (He Iwi Tahī Tātou)

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New Zealand

In 1863 my great great grandfather, Rāniera Ellison, found 300 ounces of gold on the Shotover River. His dog had fallen in to the river and when he surfaced his coat revealed gold dust.<sup>1</sup> By night fall Raniera and his friend Hakaraia Haeroa uncovered a significant weight in gold.<sup>2</sup>

Consequently Māori Point in the Shotover River, Queenstown was named after Rāniera and this event. Rāniera Ellison, was a half caste Māori male born in 1839 in Korohiwa, the Wellington area. In an environment that was rapidly changing for the indigenous people of New Zealand, the gold-find allowed Rāniera to forge a path of success for himself and his family. Infact Rāniera's instant wealth transfromed his life and his legacy lives on today within his Māori community, Ōtākou.<sup>3</sup>

During the early years of European settlement, prior to the establishment of government, Maori flourished in the free-trade environment. But in a climate where colonisation and Western democracy had disenfranchised individual Māori from political power and the capital to participate in the new economy goldmining offered a chance at economic success. It was an opportunity that was not impeded by class, status or ethnicity. Goldmining allowed Māori an equal footing with Europeans, free of restrictions and tarriffs.

Rāniera was not the only example of a Māori goldminer in this time period. In fact many Māori enthusiastically took up the opportunity relishing the chance of finding their fortune. In fact there are many accounts of Māori working in the goldfields. I will discuss Māori involvement in the New Zealand goldrush and I will argue that Rāniera's gold discovery was the most influential factor in the Ellison family success. It enabled steady income, well maintained and productive lands, good housing, great education and social mobility. All of this opportunity was far reaching and inter-generational and was directly related to Rāniera's gold.

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<sup>1</sup> Pers.com. *Edward Ellison*

<sup>2</sup> Pyke, Vincent, Secretary of Gold Fields, Otago Daily Times, *Report on the Gold Fields of Otago*, Issue 572, 17, [https://paperspast.natlib.govt.nz/newspapers/ODT18631017.2.33?items\\_per\\_page=10&phrase=0&query=Maori+Po+int+Ellison&sort\\_by=byDA](https://paperspast.natlib.govt.nz/newspapers/ODT18631017.2.33?items_per_page=10&phrase=0&query=Maori+Po+int+Ellison&sort_by=byDA), 1863, 10 p.

<sup>3</sup> Tipa, Rob, *Fortune favours the brave*, Te Karaka Magazine, Issue 78, 2015, pp 28-29. <http://ngaitahu.iwi.nz/wp-content/uploads/2015/10/TeKaraka67.pdf>

## A means to an end: Chinese mining techniques and technology on the southern goldfields of New Zealand

Neville A. Ritchie

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This paper examines the factors that compelled many Chinese men in the nineteenth century to forsake their homeland and try their hand on the goldfields around the Pacific Rim. It backgrounds the legacy of knowledge about mining and water manipulation in China, and the learnings and adaptations they quickly made to mine successfully. The main mining methods are outlined, and how they differed in some cases from the strategies employed by European miners. The paper highlights the significant contribution and legacy of the Chinese miners in the development, expansion and productivity of the historic southern goldfields of New Zealand.

**Figure 1.** Cromwell ‘Chinatown’, ca. 1908.



**Figure 2.** Unknown Chinese miner, Molyneux River ca. 1905.



**Figure 3.** Another view of Cromwell ‘Chinatown’ ca. 1908.



Source: All photos  
Ron Murray Collection,  
Cromwell Museum.

## After the wash up: The legacy of the miners in a small town

Jim Sullivan

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For many remote corners of New Zealand the gold rush was not the first step in building a thriving modern settlement, as happened at places like Bendigo or Queenstown. But, wherever the miners gathered, something about them usually ensured that the rush became the site of a township, which would far outlast the gold – as long as the strike was in the right sort of place.

Some rushes to hard places left only ghost towns, like Macetown near Arrowtown, where only the old school master's house and bakehouse remain, or Hamiltons in Maniototo where there is almost no remnant of the mining days, not even a ghost. Somewhere in between are places that survived as small towns, in despite the gradual dwindling of the gold returns. One such is Patearoa in Maniototo, sitting under the shelter of the Rock and Pillar Range. That Patearoa (then called Sowburn) still thrives is largely due to that very shelter. In his first report on the Sowburn gold field, Warden Charles Broad, while focussing on the likely amount of gold to be found, ended with, 'the Sowburn which, perhaps for climate, picturesque position, and facilities for obtaining water, may compare favourably with any other gold field in the Province.'<sup>1</sup>

During the brief rush of 1863-64, Sowburn had conformed to the image of the hard-living gold town with tented shelters, grog shanties and even the town's one and only murder.<sup>2</sup> But, once the panning, cradling and, then, sluicing had won almost all of the easy gold, so pleasant was the location that many of the 600 miners stayed on as permanent settlers. Cottages of sun-dried brick sprang up and miners with extra abilities, such as Henry Scherp who had been a baker in the household of Prince Albert. Henry built a bakehouse which still stands. George Simpson took up his old trade of cobbling and carpenter William Chirnside added his skills to the building of the township. Most of these men continued to work small claims, but when plots of arable land became available in the 1880s the large sheep runs gave way to family farms. When Patearoa Station was cut up in the early 1900s some gold miners became substantial land holders.

By the turn of the century, the rough and ready mining camp had become a small village with a pub, shop, school, smithy, and later than some gold towns, a library and church. The legacy of gold mining was not erased however. The town still had Chinese miners fossicking up the creek and living in stone shelters, which can still be seen. Some old miners, missing out on marriage in a region where women were scarce, lived out their days as hatters or just hard cases. Like ex-convict Tom Lewis who lived, winter and summer, in a rock shelter by the side of the Sowburn, and who amused the local lads by holding a live coal to light his pipe and who would show his flogging scars to any interested visitor.

Fossickers still find gold in Patearoa, but the real legacies of the golden days are the farming families who never forget that great-granddad was a miner. A display outside the Patearoa Hall makes the point – beside a giant nozzle from the sluicing days is a plaque with a poem by David McKee Wright who rose to be literary editor of the Sydney *Bulletin* but never wrote anything better than his Patearoa poems:

'You talk of the men who spoke and wrote, we give them their praises due,  
And the men of the fleece and the axe the plough had a mighty work to do;  
But the silent army of claim and mine were the meu who led the way.'

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<sup>1</sup> *Otago Daily Times* 6 September 1864

<sup>2</sup> Jim Sullivan, *Patearoa Papers Volume One The 1860s*, Rock and Pillar Press, Patearoa 2014.

## The New Zealand Mine Plan Project

John Taylor

Subsurface Investigations and Mineral Resources Consultant Western Ventures (2013) Limited  
22 Munson Street, Reefton, 7830, New Zealand

The Pike River Royal Commission found regulation of mine planning was lacking, with insufficient focus on mine plan compliance and health and safety requirements. It recommended that regulators collaborate to ensure that health and safety is considered as early as possible and before permits are issued, and that the Crown Minerals regime should be changed to ensure that health and safety is an integral part of permit allocation and monitoring.

Mine plans map the layout of an underground or opencast mine and are important deliverables from the minerals industry. This ensures both operators and regulators have oversight of mining activities ensuring that factors such as health and safety, environmental, and resource optimisation are all taken into account when assessing annual reporting compliance or permit applications.

In addition to current mine plans, historic plans from around New Zealand have been catalogued from museums, libraries and private collections to be discoverable in a central repository. Mine plans more than five years old and historic plans are available for the public to view and use. “What we now have are robust standards for when mine plans are submitted, a repository for all current plans and a catalogue of historical plans – and as a result much improved access to important information for government agencies, local authorities, mine operators and the public,” says Paul Hunt, Chief Inspector Extractives at WorkSafe’s High Hazards and Energy Safety Unit.

For the last four years I have been flat out working for New Zealand Petroleum and Minerals tracking down, cataloguing of all the remaining mine plans and mining-related plans of New Zealand employing high resolution, colour lasing scanning of the best of these identified plans. The website site has just gone live with 3500 plans and this will grow shortly to 6000 plans (<https://mineplans.nzpam.govt.nz>)

This has a one-man effort (me!) over this four-year period and has involved visiting and cataloguing the entire contents of all the museum /archives /libraries /private and company mine plan collections throughout the whole of New Zealand. A different team were involved in setting up the public-accessible website.

My work on this project has essentially been completed but it is expected that more people still holding plans will make themselves known as the knowledge of the websites becomes better known.

## Notes

## Field Trip Program

### Field Trip Schedule 7-13 October 2018

Day	Times	Activities and Locations
<b>Sunday</b>	10 am-5.30 pm	Pre-conference trip (optional) to Gabriel's Gully and the historic gold town of Lawrence. Meet at Memorial Hall, Cromwell.
<b>Monday</b>	9.30 am – 4.00 pm	Local field trip to Bendigo – Welshtown. Matilda Track, Aurora-Longtown-Pengelly's Track.
<b>Wednesday</b>	2.00 - 6 pm	Field trip to Gibbston-Arrowtown – Lakes District Museum.
<b>Thursday</b>	2.00 - 4.00 pm	Local Field Trip to Clyde Free walking tour of Clyde Historical Town (brochure included). Meet at the Dunstan Lodge 3pm for a wine-tasting, hosted by Perseverance Wines.
<b>Friday</b>	2.00 – 5.00 pm	Field trip to Bannockburn.

### Detailed Information

#### **Saturday, October 6 (optional self-drive pre-conference tours):**

Self-drive visits to areas of goldfields interest:

- Skippers Canyon jetboat trip <https://www.skipperscanyonjet.co.nz/>
- Bike sections of a bike trail! <http://www.otagocentralrailtrail.co.nz/>
- Clutha River jetboat cruises <http://www.clutharivercruises.co.nz/>
- Gabriel's Gully Historic Reserve, Lawrence (also China Town Reserve)
- Museums worth visiting: Central Stories (Alexandra), Clyde, Naseby
- 4WD tour to Historic Macetown  
<https://www.nomadsafaris.co.nz/tours/gold-heritage-4wd/macetown>

#### **Sunday, October 7 (optional organised pre-conference tour):**

tour of to Gabriel's Gully and the historic gold town of Lawrence and heritage area (departure from Cromwell; meet outside Memorial Hall 10am) which is a significant heritage opportunity.

*Note: (1) there will be a separate cost for this trip (to be advised)*

*(2) strictly by advance booking, as we will need to make mini-bus transport arrangements.*

#### **Monday, October 8 (first official day of conference):**

8.30 – 9.30am Meet at Cromwell Memorial Hall for registration, meet & greet.

10am depart via bus for walking tour of Bendigo Historic Reserve. 9.30am for 10am departure.

- We will use two mini-buses to ferry delegates from Bendigo Dredge ladder to Welshtown car-park. Self-drive option available if this is wished.

- The walking area is not particularly hard, but there are some reasonable distances to cover. Good walking shoes strongly recommended.
- First walk 11am – 12.30 Matilda track, return to Welshtown carpark for lunch. Long-drop DOC toilet available here only.
- Picnic lunch. (the less mobile may choose to return to Cromwell instead of the second track. Please advise if you intend taking this option, as transport arrangements must be made in advance).
- 1.15 – 3.15 pm Aurora/Logantown/Pengelly's track, return to Welshtown carpark.
- Mini-bus ferry down to foot of hill. Bus 4pm back to Cromwell for a cuppa and catch-up registrations.

Guide: Dr Lloyd Carpenter (Bendigo was the focus of his 2010-2013 PhD)

### **Wednesday, October 10:**

9.00 am -2.00 pm presentations then bus tour for all delegates (note that the venue is not available to us for Wednesday evening due to a regular booking).

Beginning at Cromwell, head west to the Goldfields Centre (guided tour, reconstructed Chinese village, gold panning opportunity: admission charge included in conference fee), then via Gibbston to Arrowtown and the Lakes District Museum, Chinese village and the Arrowtown historic precinct. Return to venue for 6:00 p.m.

### **Friday, October 12:**

9.00 am- 1.00 pm presentations

1.30 pm bus to Bannockburn Historical Reserve 2.00-4.00 pm Return to venue 4.30 pm (unless a visit to the Bannockburn Hotel is desired on the way back...), Guide: Lloyd Carpenter

Venue for the week

(<http://www.centralotagonz.com/cromwell-bannockburn/cromwell/community-facilities/x,1,4133/cromwell-memorial-hall.html> )

### **Saturday, October 13 (optional organised post-conference tour):**

Meet at venue 9.30 am for 10 am departure via bus.

Beginning at Cromwell, we head east and north to Northburn herringbone tailings historic reserve (this is a 1km each way walk), then back on the bus to goldfields Memorial, then Earnsclough dredge tailings historic reserve, Beck's White Horse Hotel, Cambrian's school, finishing at the St Bathans Blue Lake and Vulcan hotel *picnic lunch or buy lunch at the Vulcan*, returning via Golden Progress Reserve and the Hay's Engineering works, Oturehua. Back at the conference venue at 4pm.

### **Sunday, October 14 (optional self-drive post-conference tours):**

Self-drive visits to areas of goldfields interest:

- Skippers Canyon jetboat trip <https://www.skipperscanyonjet.co.nz/>
- Bike sections of a bike trail! <http://www.otagocentralrailtrail.co.nz/>
- Clutha River jetboat cruises <http://www.clutharivercruises.co.nz/>
- Gabriel's Gully Historic Reserve, Lawrence (also China Town Reserve)
- Museums worth visiting: Central Stories (Alexandra), Clyde, Naseby
- 4WD tour to Historic Macetown  
<https://www.nomadsafaris.co.nz/tours/gold-heritage-4wd/macetown/>

## Site Locations

**Figure 1:** Map of the Otago Goldfields region, south island New Zealand.



## Site Descriptions

### Gabriel's Gully

Source: NZ Dept. of Conservation

From: <https://www.doc.govt.nz/parks-and-recreation/places-to-go/otago/places/gabriels-gully-historic-reserve/>

Gabriel Read's discovery of gold in an Otago valley in 1861 changed the course of New Zealand history. Gabriels Gully was the site of the first major gold find in Otago which led to the gold rushes of the early 1860s which transformed the province, making it the wealthiest in New Zealand. It triggered the country's first major gold rush with a wave of prospectors descending on the gold fields. The population of Dunedin rocketed and Otago was transformed into the wealthiest province of New Zealand. The economic spin-off from gold mining was a massive boost to the young New Zealand economy.

Read's gold discovery was just the tip of a vast gold deposit. There was so much gold and it ran so deep that it took 70 years and a succession of more elaborate technologies to get to the bottom of the deposit. The revolutionary Californian technique of hydraulic elevating was pioneered here in 1879. Elevators working like giant vacuum cleaners sucked up the gold-bearing gravel from underground forcing it up under high water pressure.

#### **Gabriel Read's gold find 1861**

Prospector Gabriel Read (1825-1894) found gold in the gully on 25 May 1861. Read was equipped with a 'tin dish, a butcher's knife and a spade' digging in the creek bed. After working through a metre of gravel Read reached soft slate, and in his well-known words 'saw the gold shining like the stars in Orion on a dark frosty night.' This discovery changed the future of Otago.

#### **Early gold mining 1861-1862**

Hundreds of people left their jobs and flocked to the gold field; 256 ships arrived at Port Chalmers in 1861 carrying hopeful prospectors. There was a 100 km walk between Dunedin and the Tuapeka gold fields in often harsh conditions carrying supplies.

Early photographs of Gabriel's Gully show a scattering of tents on the valley floor and the lower slopes of the surrounding hills, with piles of stones from the individual workings like mole hills across the valley floor. The first claims were 24 ft (8m) square, worked with a cradle or pan to separate the gold from the wash dirt. The life of the alluvial gold miner is the stuff of national imagination: their distinctive lifestyle based around chasing the illusive ore, working hard, playing equally hard, with a sense of adventure, shaped the identity of Central Otago.

Gold returns from Lawrence (and this is not just the Gabriel's Gully field) were 171,038 ounces in 1861 and 199,547 ounces in 1862, thereafter dropping away. As a consequence Otago became the wealthiest and most populated province in the country.

#### **Developing the gold mine**

By 1863 this was no longer a field for individual miners as more elaborate technology was required to extract the gold. Companies were formed and sluicing and later, blasting, became the dominant method of mining. By 1865 there were 542 miles (872 km) of water races at the Tuapeka goldfields.

Mining using hydraulic elevating began at Gabriel's Gully in the 1880s enabling old tailings to be reworked with a small labour force. Seven major companies were involved in the 1880s. These ventures were combined into the Blue Spur and Gabriel's Gully Consolidated Company in 1888. This company operated until 1912 when it was finally wound up having won 51,500 oz gold.

In 1911 the jubilee of Gabriel Read's discovery was celebrated with processions and a reunion of the 280 surviving miners from 1861. Over 2500 people attended the festivities.

### Later mining

There was some mining during the Depression years of the 1930s when individual miners returned to the 1860s technology, mining with pick, shovel, pan and cradle. Mining finally ended in that decade, making Gabriel's Gully and the associated Blue Spur the longest operative goldfield in Otago.

**Figure 2.** Gabriels Gully and miners' tents in 1861, view to the south.



Source: *Otago Witness*, 31 May 1921.

## Lawrence Chinese Camp

Helen McCracken, NZ Historic Places Trust,  
from <http://www.heritage.org.nz/the-list/details/7526>

The site of the Chinese Camp at Lawrence has significant historical value. It represents an essential aspect of Chinese experience of goldfield's life in Otago, providing insight into this culturally important part of New Zealand history. Another important Chinese camp at Cromwell was drowned by the hydro-lake, Lake Dunstan, created by the Clyde Dam, making this extant site an even more important remnant of the past.

Chinese miners' lives in goldfields Otago has taken on an iconic status mainly associated with the image of lone old men at the decline of the goldfields. The Chinese Camp site provides the opportunity to interpret aspects of Chinese life as a community. The former hotel, associated outbuilding and an already registered ex-Joss house in Lawrence are the only buildings left associated with the site. The buildings and the archaeological remains provide insight into a diversity of experience, from relatively wealthy (and accepted by Europeans) hotel owner Sam Chiew Lain to the modest hut site remains in the township. The camp also provides a link with stories about Chinese miners and connections between the camp and life on the surrounding goldfields.

### **Archaeological Significance:**

The former Chinese Empire Hotel and associated outbuilding are the only buildings left on the site of the Camp. The hotel was designed by a prominent Dunedin architect and is a rare Otago example of such a building built on this scale in a rural setting for a Chinese client. While it is not outstanding architecturally, particularly given its later modification into a residential building, its position in the Chinese Camp, and as a mixing place for the Chinese and European clients, makes it significant. The camp's site on poor quality land on the outskirts of town makes a significant statement about European attitudes to the Chinese miners during the goldrush period. Its location has significance in the landscape of Lawrence as a whole (as a community exiled from the township).

The site of the Lawrence Chinese Camp is highly archaeologically significant. According to SO 8034 there were around 32 small buildings of various types on site, as well as the hotel. Archaeologically it appears to have never been ploughed or disturbed significantly. The major areas of modern disturbance in the main "camp paddock" are outside the main camp area (judged by using overlay of 1882 plan on archaeological plan). This is therefore a virtually complete and intact archaeological site of an entire community. The value of this should not be underestimated as it has enormous archaeological potential for research, interpretation and public interpretation. Other Chinese settlements are known to have existed but many have been destroyed or damaged; Arrowtown has been excavated and restored as a public park area; Cromwell was excavated before destruction by the Clyde power scheme; Macraes has been covered by a road embankment. Lawrence is both intact and highly accessible.

**This historic area was registered under the Historic Places Act 1993.**

### **Cultural Significance:**

The Chinese Camp has significance as a largely Chinese community within the European surrounds of Lawrence. It was a place where Chinese culture predominated, providing support for the wider Chinese goldfields population in the vicinity. It is a place where Europeans largely entered on Chinese terms and the history and images associated with it provide an interesting insight into the relationships and attitudes between the two communities.

Interpretation and research into the stories associated with the site would provide important insight into this aspect of the social and cultural past, as well as an opportunity to help people to understand the intersection between cultures in New Zealand's past and present.



**Figures 3-4.** Chinese Empire Hotel (above)  
Chinese temple (left).

Source: Photographs Lloyd Carpenter  
2017.



**Figure 5.** Chinese Township street scene 1921.  
Source: 'Gabriels Gully Gold Discovery Jubilee'  
*Otago Witness*, 31 May 1921.



STREET SCENE IN THE OLD CHINESE TOWNSHIP.

## Bendigo

Lloyd Carpenter (extracted from PhD thesis)

Bendigo is an abandoned mining town high on the tussock-covered hills fourteen miles (22.5 km) north of Cromwell administered by the New Zealand Department of Conservation. It offers a quintessential Central Otago goldfields landscape of mining remains and schist cottage ruins.

Bendigo's worth has less to do with its spectacular beauty, and more to do with its unique location in time and place, as a player in the Central Otago gold rush and in its uniqueness in being abandoned and left unmodified, protected under the strict code of New Zealand's Historic Places legislation. Bendigo played a key role in the Central Otago gold rush, yet it is a role which has faded from the collective memory due to its isolation and dereliction prior to its gazetted as an Historic Reserve under the status of 'Protected Private Land' in 1983 and its move into the Crown estate under management by the Department of Conservation in 1994 by its former owners. With the sesquicentennial of the gold rush celebrated in 2012, this well-preserved area drew new attention from people interested in re-examining such sites as representational of this remarkable chapter in New Zealand's pioneering past.

The Central Otago rush began in August 1862 when the Californians Reilly and Hartley declared a 87-pound gold find near modern Cromwell. It spread across the province rapidly and in late 1862 an old Maori greenstone trail over the Dunstan Range was used by miners heading for the ferry at Alberttown, on their journey to the rich Queenstown Lakes District, Cardrona and Shotover areas. At the western end of this trail, just before it turned north to the ferry, the route traversed a shallow basin-shaped valley. In this (initially) un-named spot, a few miners found relatively sparse alluvial ground compared with the vast golden wealth elsewhere in the province. After a few months of desultory, poorly-rewarded surface workings hampered by a lack of water, they abandoned any attempt to develop the field until mid-1864, when sluicing companies, the one kind of mining enterprise that can make poor ground pay, dug races to the area and the increased water flow<sup>1</sup> led to a resurgence of alluvial mining, with a population of 130 and the decision, presumably by veterans of the Victorian rush, to name the area 'Bendigo Gully' after the iconic Australian site where many fortunes were made in the 1850s.<sup>2</sup>

Reports of quartz adhering to the gold found in the gully led miners to seek Bendigo's reefs. Quartz prospectors came and went, finding hints of auriferous stone but nothing to justify the substantial expense of developing a mine. In June 1866, Thomas Logan and John William Jack) Garrett, two men who had met while developing separate sluicing projects in the Kawarau Gorge at Roaring Meg, found the outcrop of a reef overlooked by others seeking payable quartz at Bendigo.<sup>3</sup> As they began extracting stone to explore further, Logan and Garrett very quickly discovered that enthusiasm and a promising find was insufficient to live on and their situation was further complicated by the high cost of a quartz lease, which required a £20 deposit to register it, an official survey and rent of £5 per acre per year. One indication of just how lean things were, is shown by the fact that a Clyde hotelier had to sue Garrett for payment of the cost

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<sup>1</sup> The volume of water in Bendigo Creek was supplemented by the Rise and Shine sluicers, see Carpenter, L. (2012) 'A 35 – Year Endeavour: Bendigo's Rise and Shine Sluicing Syndicate' in the *Australasian Historical Archaeology* journal, Vol. 30, pp. 5-13.

<sup>2</sup> Carpenter, L. (2013) 'Lighting a gen'rous, manly flame: the nostalgia for "dear old Bendigo"', *Journal of Australian Studies*, Vol. 37, No. 1, pp. 76-95.

<sup>3</sup> Carpenter, L. (2011) 'Reviled in the record: Thomas Logan, and the origins of the Cromwell Mining Company, Bendigo, Otago', *Journal of Australasian Mining History*, Vol. 9, pp. 36-53.

of his hotel stay when he went there to register the claim.<sup>1</sup> In the end, this financial pressure sent them looking for a third partner. They needed someone dependable, enterprising and most importantly, solvent. Their good friend, the Danish entrepreneur and explorer George Magnus Hassing, was too busy to join them but introduced them to another of his friends, Brian ‘Charcoal Joe’ Hebden, who paid £20 for his shareholding.

They spent eighteen months developing their claim with the help of Hebden, who supported them by mining elsewhere. By early 1868, the stone coming out of the claim changed from vaguely promising to clearly payable, so to meet the costs of a quartz stamper battery, water rights, miners and road-building to fully develop their mine, Logan, Garrett and Hebden used their gold-infused ore samples to persuade the prominent Cromwell hotelier, George Wellington Goodger to join them.<sup>2</sup>

Canadian-born Goodger was the obvious man to approach. He had come to Cromwell in 1862 as one of its first residents, where he traded in timber, worked as a builder, was the pioneer dairyman in the region, dabbled in sluicing at Hartley’s Beach and mining at Quartz Reef Point (in the *Nil Desperandum* dam-building project with Hebden) and in 1865 he built his Junction Commercial Hotel. Goodger’s experience in Victoria and California meant he recognised the richness of the stone Logan, Garrett and Hebden showed him so the foursome registered the ‘Cromwell Quartz Mining Company,’ purchased a quartz stamper and water wheel from a defunct Hindon mining company and while they waited for it to be erected, raised over 500 tons of stone, hired roadmen to blast out a three mile dray road from their claim on the hill down to their battery site at the gorge mouth.

After six months of quiet success, a warden’s report broadcast their secret, declaring returns exceeding three ounces of gold per ton with patches of over eight ounces, a remarkable achievement blighted only by the death of Garrett in a riding accident. But it was clear to all that for the first time in Otago, quartz mining could be very profitable and that this was a significant turning point in Central Otago’s gold story, with previous efforts at Rough Ridge, Arrow, Hindon, Macraes and Ida Valley each ending in disappointment, where ‘sure thing’ stone proved to be quartz that could not be made to pay.<sup>3</sup> These failures and consequent evaporation of investor capital had led to the widespread perception that quartz mining was not worth the financial risk, so with the news from Bendigo, quartz prospecting renewed in intensity across Otago yielding new finds in Macetown, Shotover, on the Carrick Range, at Tuapeka and in the locale of Logan and Garrett’s big find.<sup>4</sup>

The achievement of the Cromwell Quartz Mining Company meant that miners, prospectors, investors and business owners crowded to Bendigo and the claims of over fifty companies<sup>5</sup> covered the landscape by February 1870, prompting the development of two towns and attracting a peak population of about five hundred. However, despite early – and in some cases, very rich – promise, each of the other Bendigo mining companies came and went, along with their owners’ dreams and money and only the Cromwell Company stayed and paid dividends. Some, like the Colclough, Aurora, Hit and Miss and Alta ventures, lasted up to six or seven years, each leaving evidence of their passing, such as the ‘Hit and Miss’ road of 1875 and the Aurora open-cut of 1869-74, but no company came close to leaving a mark on Otago’s financial landscape like Logan’s long-running mine.

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<sup>1</sup> Clyde Magistrate’s Court Judgement Book, Archives New Zealand Dunedin Office DADO Acc D557 138a.

<sup>2</sup> Carpenter ‘Reviled in the record.’

<sup>3</sup> *Dunstan Times*, December 28, 1866

<sup>4</sup> *Otago Witness*, June 26, 1869, p.15, April 23, 1870, p.11

<sup>5</sup> *Cromwell Argus*, January 17, 1870

The Cromwell Company mine proved to be the richest in nineteenth century Otago, and the surviving pioneer shareholders sold out in the mid-1870s to become very wealthy men. It finally closed in 1903 as the last English capital was exhausted, the last payable stone was raised and the lowest levels were flooded.

There was a brief resurgence in the 1930s, with Government Unemployment Board-sponsored projects like an adit to drain and open out the lowest part of the old mine, a new mine in the Rise and Shine Basin and a dredge at the Bendigo Gorge mouth, but each was a financial failure, yielding little gold to show for years of work and thousands of pounds spent.

**Figure 6.** Ruins of stone houses and Pisa Range in the background, Welshtown, Bendigo goldfield, Central Otago.



Source: Photograph © Lloyd Carpenter 2012.

## Gold panning at Goldfields Mining Centre “Where the Past & Present Meet” A fascinating insight into New Zealand’s early history

From: <https://www.goldfieldsmining.co.nz/>

It was the lure of GOLD that brought the first settlers into Central Otago and paved the way for today’s tourist towns of Queenstown and Wanaka. Today there are few reminders of this early history. The Goldfields Mining Centre is a special place where visitors can gain an appreciation of the life and working environment of those early miners who struggled against the harsh and sometimes dangerous conditions along Central Otago’s famed Kawarau Gorge.

Located on the banks of the spectacular Kawarau River, the Goldfields Mining Centre is an historic reserve which has been set aside by New Zealand’s Department of Conservation to preserve an authentic mining site where gold has been mined for over 100 years and can still be found in the rocks and gravels of this unique area.



**Figure 7.** Hydraulically driven, operating stamp battery, Goldfields Mining Centre, Kawarau Gorge, Otago.

Source: Photograph Ken McQueen 2018.



**Figure 8.** Reconstructed Chinese Village, Goldfields Mining Centre.

Source: Photograph © Lloyd Carpenter 2017.

## Arrowtown Chinese Settlement (1869) - Stranded in paradise?

Gavin McLean, from <https://nzhistory.govt.nz/media/photo/arrowtown-chinese-settlement>

In 1998 George Griffiths and Anthony Ritchie saluted 150 years of organised European settlement in Otago with their musical pageant, *From the southern marches*. Just before the curtain came down they had the ghost of goldfields balladeer Charles Thatcher musing about modern Otago. ‘We don't eat proper porridge/Or haggises for tea’, this imitated ‘Inimitable’ sang, ‘it’s dimsims and chapatti/Our New Identity’ – a reference to the term that the Scots Presbyterians used against others, especially English latecomers.

A hundred years ago many would have taken a dim view of the dim sims or anything Chinese. The first ‘Celestials’ reached the goldfields in the mid-1860s, initially recruited by provincial authorities. By 1876 4000 were picking over ground European miners had abandoned (not that that stopped the latter from howling about race contagion). Almost entirely male (only nine of the 5004 Chinese here in 1881 were women), these hardy, mainly Cantonese migrants built their own isolated little communities. Few made enough money to return home triumphantly and most died here old and persecuted. ‘There is about as much distinction between a European and a Chinaman as that between a Chinaman and a monkey’, Premier Richard Seddon once said. A discriminatory poll-tax was not abolished until 1944. It took until 2002 for the New Zealand government to formally apologise to the Chinese community.

Central Otago had several Chinese settlements. Arrowtown’s was studied extensively by archaeologists in the early 1980s and is the best memorial to these settlers. It is now a mixture of stabilised hut ruins, reconstructions and restorations. The most prominent is what is now known as Ah Lum’s Store, once one of several. Market gardener Wong Hop Lee built it about 1883. It got its name from a later occupant, Ah Lum, who bought the building about 1909. It measures just 7.5 by 4.8 m, with local schist providing the walls and floors and corrugated iron the roof. Inside that tiny box, wooden partitions divided off five rooms. The store occupied half the space, some of the goods hanging from the ceiling by hooks and wires. Behind were a bank/office, kitchen and bedrooms, Ah Lum's protected by iron bars (he was also banker to the local Chinese community). Ah Lum died in 1927, one of the last entrepreneurs of an ageing, dying goldfields community.



**Figure 9.** Entrance to the Chinese Settlement, Arrowtown, Otago New Zealand.

Source: Photograph Ken McQueen 2018.

## St Bathans - Blue Lake and how the gold got there

University of Otago Geology Department  
Geology by Dave Crow Presentation by Anna Crow

<https://www.otago.ac.nz/geology/research/gold/gold-in-otago/blue-lake-gold.html>

Blue Lake, at the foot of Mt St Bathans in Central Otago, is one of several important historical gold mines in the area. Mt St Bathans is made up of 200 million year old greywacke and that continues deep under the Blue Lake area. It is unusual to find gold associated with greywacke, and it was a long and complicated geological journey that ended with the large concentrations of gold where St Bathans town now stands.

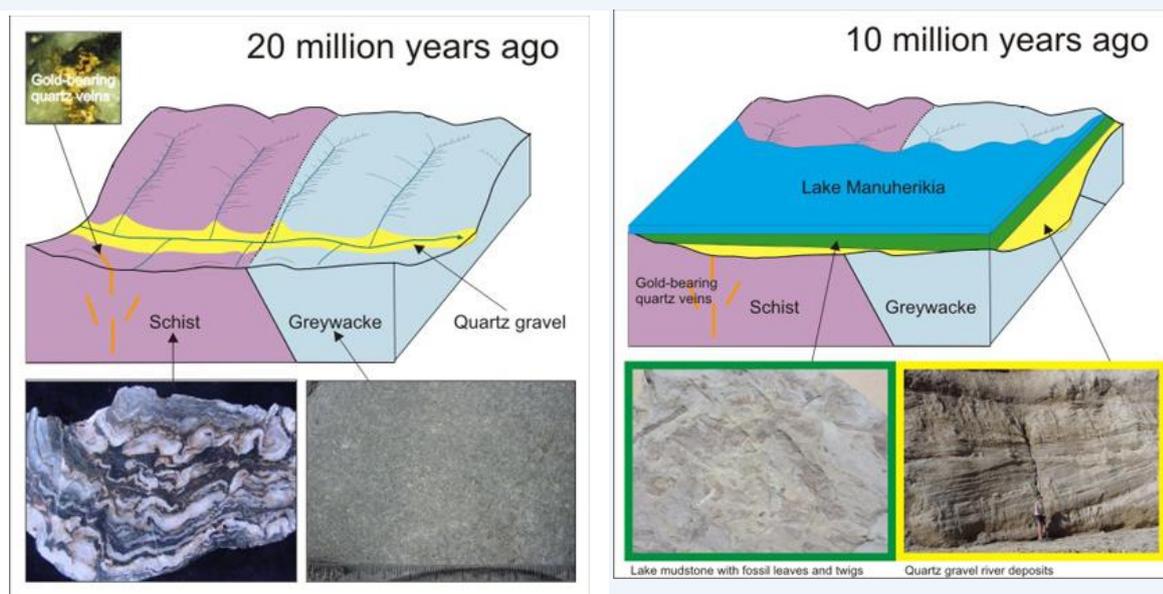


**Figure 10.** The man-made Blue Lake at St Bathans.

Gold typically occurs in quartz veins in schist (see diagram below). Schist bedrock and gold-bearing veins occur tens of kilometres to the southwest of the St Bathans area. Greywacke was faulted against schist about 100 million years ago. About 20 million years ago, erosion of schist hills produced river sediments rich in quartz pebbles. The quartz pebbles result when the white quartz layers in schist break up and become rounded during river transport. Some of the quartz came from gold-bearing veins, and the gold was

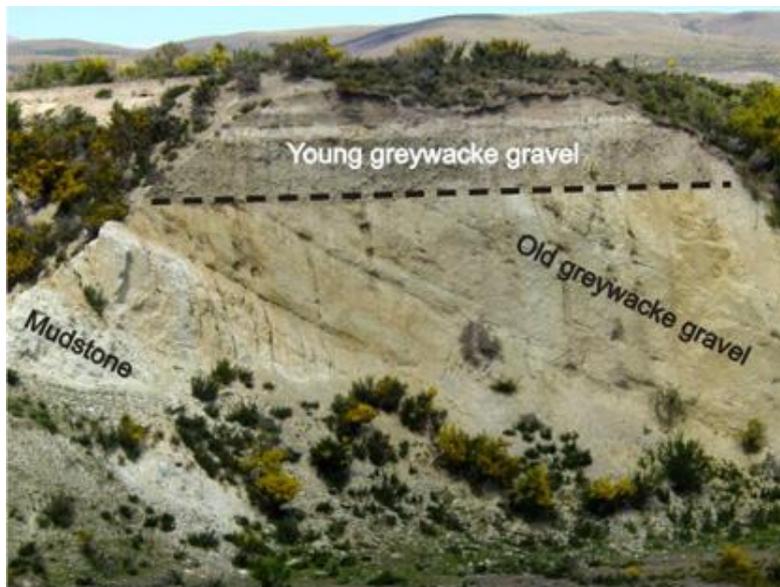
transported at the same time. The quartz pebbles and gold were transported northeast and deposited on greywacke bedrock (Figure 11). Some greywacke pebbles entered this river, but not resistant to abrasion like quartz, most of them ground away.

**Figure 11.** Geological reconstruction of the Blue lake area at 20 million and 10 million years ago.



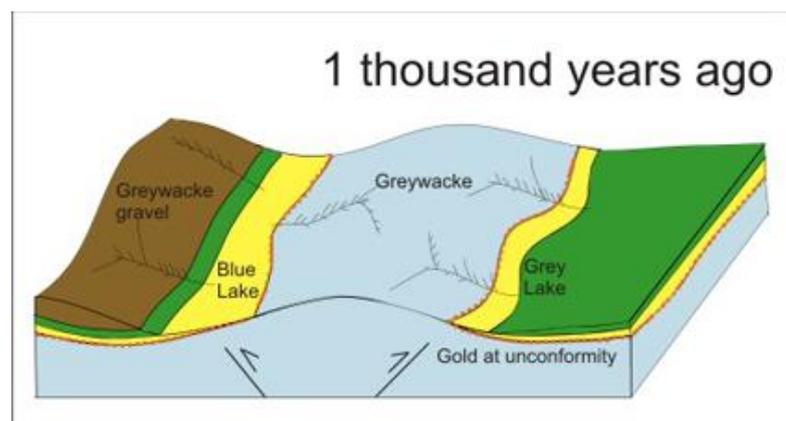
Ten million years ago, the quartz river sediments were buried by a large shallow lake, Lake Manuherikia, which covered most of Central Otago (Figure 11). The lake sediments preserved leaves of the local vegetation (including eucalyptus) and bones of animals such as lizards and small mammals. The lake sediments were, in turn, buried by gravels from the mountains that we see today. These mountains began to rise about 5 million years ago. The resultant greywacke gravels progressively filled the lake, on the margins of the mountains.

Continued uplift caused tilting of the greywacke gravels, and the underlying quartz gravels and mudstones. Even younger gravels, associated with modern rivers, deposited new gravels on top of the older tilted sediments. Gold from the eroding quartz gravels accumulated at the boundary (unconformity) between the gravel sequences (so-called “Maori Bottom” of the old miners, Figure 12).



**Figure 12.** Tilted mudstone and greywacke gravel (5 million years old) with younger greywacke gravels on top. Gold occurs at the boundary.

**Figure 13.** Blue Lake area at 1 thousand years ago.



**Figure 14.** Pink baked sediments and grey melted sediments.

As the mountain-building tilted the old river and lake sediments, it also affected the underlying greywacke bedrock. In the St Bathans area, a greywacke ridge was pushed up along the Blue Lake Fault which trends northwest from Oturehua. As that ridge was pushed up, the sediments were tilted so that they now slope southwest on the St Bathans side, and slope northeast on the other side, where Grey Lake is located (Figure 13).

The quartz gravels were eroded into younger river deposits as the ridge was pushed up. Gold in the modern streams alerted the original prospectors to the deposit at St Bathans. Plant material within the pile of quartz gravels had formed lignite during burial. When that lignite was exposed during uplift, and subsequent mining, many lignite seams ignited and some burnt for many years, baking the surrounding quartz sediments red and brown like bricks (as on the road down to Blue Lake, Figure 14).

The erosion surface where quartz gravels rest on bedrock (called an “unconformity” by geologists, and a “bottom” by gold miners) is the most important geological feature in the story of gold mining in the St Bathans area. The gold was concentrated near the bottom of the quartz gravels at and near the greywacke erosion surface.

The gold miners followed this surface downwards from the greywacke ridge, sluicing the rest of the quartz gravels and lake sediments out of the way (Figure 14). The greywacke surface is soft because groundwater from the quartz gravels altered the greywacke to clay. Hence, some of the greywacke was sluiced away as well. The miners followed the gold-bearing surface down the slope until they couldn't raise the gravel any more, and couldn't drain the area. As soon as they stopped mining, the hole filled in with water, and Blue Lake formed. An unknown amount of gold-bearing gravel still exists beneath St Bathans town and the hills to the southwest. A mirror image of this geological and mining situation occurred on the other side of the greywacke ridge, to form Grey Lake (Figure 15).

**Figure 14.** Blue Lane and exposed mining surface.



**Figure 15.** Grey Lake from the northwest.



**Figure 16.** Hydraulic elevator, St Bathans, ca. 1890s. This elevator was used to pump gravels from the pit to a higher level for processing and extraction of the gold. It operated until 1934.



Source: Alexander Turnbull Library.

## Beck's Hotel

Lloyd Carpenter Extracted from PhD files. © 2013

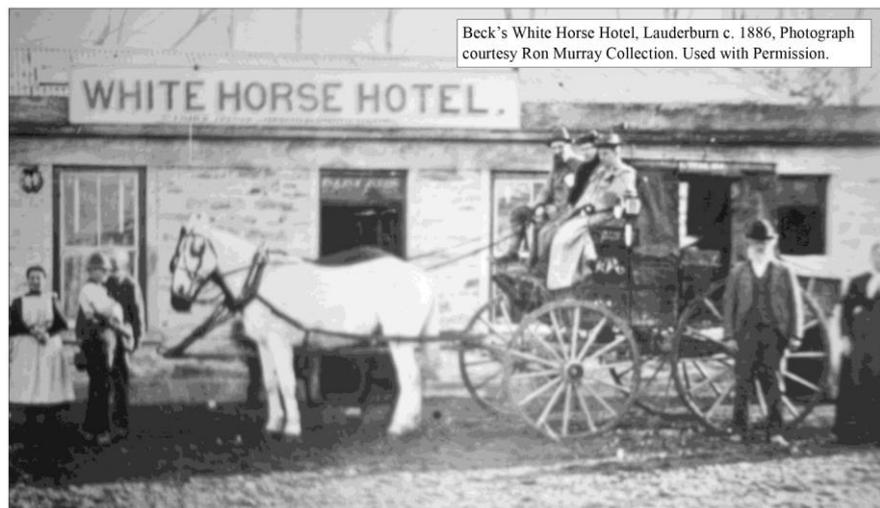
John Beck was mining at the Arrow goldfield in late 1863 and early 1864<sup>1</sup>. He ploughed his accumulated earnings into an hotel at Blackstone Hill Station. When floods severely damaged this in early 1866, he rebuilt on the opposite side of the river, on 100 acres he purchased from Mr Cogle, the owner of Lauder Station.<sup>2</sup>

The new hotel had 10 bedrooms and two sitting rooms, a bar, and a dining room of sufficient size that 16 guests could sit down to dinner. His hotel became the changing post for the coach across the Maniatoto Plain on its way to Alexandra.<sup>3</sup> His hostelry was so prominent as a business place and landmark that it lost the name 'Lauderburn' and became known (and is known today) as 'Beck's'. When he died in 1870, his sate was valued at £50.<sup>4</sup>

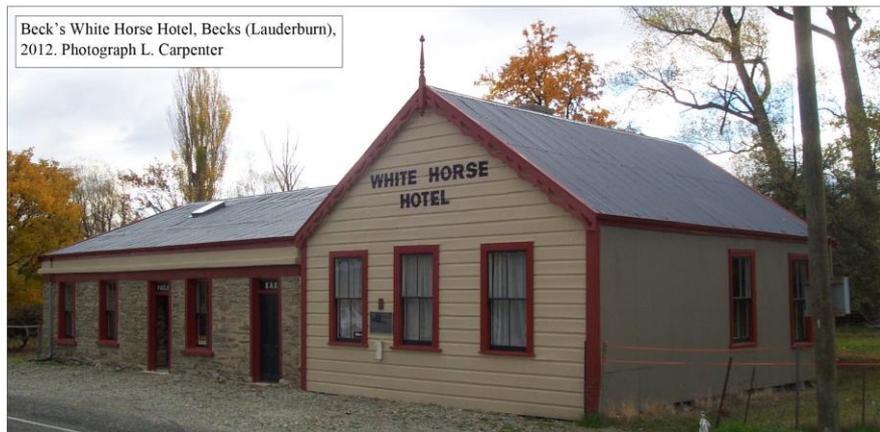
Louisa Beck continued to run the hotel until 1874, when she married Robert McMorrان, a sheep farmer from Lake Hayes. She retained ownership of the hotel, leasing it to James Milward until McMorrان's death in 1881.<sup>5</sup> She ran the business by herself for at least a year until she married a former miner and teamster called William Fisher and they ran the hotel together.<sup>6</sup>



Beck's White Horse Hotel, Blackstone Hill Station  
c. 1865, Photograph L. Carpenter personal collection.



Beck's White Horse Hotel, Lauderburn c. 1886, Photograph  
courtesy Ron Murray Collection. Used with Permission.



Beck's White Horse Hotel, Becks (Lauderburn),  
2012. Photograph L. Carpenter

<sup>1</sup> Beck, J., 19 February 1864, 12 mile, Archives New Zealand Dunedin Office: Arrow Town Warden's Court Registration Book of Water Rights, Residence Areas and Extended Claims; container code C 739 003, reference AEPG D568 22784 box 74

<sup>2</sup> FLOODS IN OTAGO, West Coast Times, Issue 346, 1 November 1866, Page 3

<sup>3</sup> THE CROMWELL GOLD FIELDS, Otago Daily Times, Issue 2451, 14 December 1869, Page 2

<sup>4</sup> Beck, J., Archives New Zealand, Dunedin Office, Legacy Duty Register 1871 - 1913 C 720 968 DAGI D247 9007 Box 2

<sup>5</sup> Local, *Mount Ida Chronicle*, 14 June 1879, p. 3.

<sup>6</sup> Cyclopaedia, p. 624.

## Notes

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