

# A 35-year endeavour: Bendigo's Rise and Shine sluicing syndicate

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*An enduring legacy of the Central Otago gold rush is the network of water races crossing the landscape. Lacking the romance of schist cottage ruins or hint of enterprise inherent in herringbone tailings, mullock heaps and dredging tailings, these watercourses are unremarkable except for their potential re-use for irrigation.*

*But the employment and judicious use of water was critical to the development of gold claims, when self-taught hydraulic engineers organised, financed and built water races to open alluvial mining areas. The Rise and Shine syndicate worked their sluicing claim in Bendigo Creek's headwaters for 35 years and changed the fortunes of the Bendigo Gully gold field.*

*Examination of the syndicate and its archaeology reveals a group of miners who developed a profitable claim, built a community and proved adept at employing their water resource in a way that confounds popular tourism-oriented depictions of the gold rush as rootless men in ephemeral towns.*

## INTRODUCTION: THE EMERGENCE OF SLUICING IN OTAGO

Central to the Otago gold fields narrative is the individual miner rejoicing when golden wealth is found in Skippers Canyon or being the first to stumble onto the remarkable riches of the Arrow, Shotover, Doctors Point or other now famous gold locales. This image of a miner 'making his pile' in some isolated corner of the province is pervasive and at the sesquicentennial of the initial rush of 1862, it is a trope which is revisited and reinforced in re-enactments and commemorations.

Like many cultural myths, this image has a firm basis in history, even if the period for which it was true was very short. Sergeant Bracken, the Otago Constabulary official charged with administering the Lakes District gold field and keeping the peace within its vast boundaries, wrote several reports that made it clear that the Otago rush in general and the Shotover River in particular, were very rich indeed. In December 1862 he reported miners 'washing as high as a pound weight to the tin dish out of the sand on the [Shotover] beach', (*Otago Daily Times* 9 December 1862:7) and caused a stir when he reprinted a February 1863 letter sent to him by his brother at 'Foxes' (now Arrowtown): 'We are doing very well; we washed out 12 pounds weight the past week, and we expect to make £800 each (three) in the next two weeks'. (*Otago Witness* 7 February 1863:2). Other reports tell of similar riches being hauled from streams throughout the province. But the stories of remarkable successes, wresting pound-weight gold hauls in a matter of mere days or weeks were not universal and did not persist. In Otago, as it did in fields elsewhere, mining evolved from individual claims to group endeavours on a wider scale. This suited miners who had houses for their wives and children and who sought a more settled society in their newly-adopted home. These amateur geologists gained expertise in analysing test pits sunk into the strata of old riverbeds and dry terraces, perceiving slight changes in alluvium to decide where to concentrate their efforts, developing the technology to access the gold there. They realised that the scale and expense of the task of exploiting these resources required the abandoning of solitary mining efforts to work in syndicates or for wages, becoming large-scale alluvial sluicers (*Otago Daily Times* 18 June 1864:1).

Sluicing was favoured for gold in the strata of gravels on hill sides and in riverside terraces. Water was conveyed along water races from its source to hoses connected to water guns at the claim site, where gravels were washed into a 'tail race', trapping the gold and washing away the waste tailings via a sludge channel into nearby streams. As claims were developed, larger stones were stacked, creating distinctive tailings. The gold fields landscape of Otago has spectacular reminders of sluicing: the herringbone patterns of the Northburn Reserve at Quartz Reef Point and the moonscape of Bannockburn reveal the work of many groups of miners over decades. These ruins and sluicing scarps throughout Central Otago justify California's decision to ban large-scale sluicing as a practice in 1884 (Holliday 1999:274).

The process leading to these changes in the landscape was lengthy. Sluicing enterprises were never straightforward, since they required syndicates of miners, interaction with the gold fields administration, and the identification of, and a claim on water in the required quantities from reliable sources. Water rights were defined by legislation in terms of 'sluice heads of water'<sup>1</sup> drawn, minimum flow required to be left and the fees per head per year. Unlike Australia where shortages were the norm, in Otago getting water from where it was found to where it was needed was a task of mastering topography. As the Otago miner published in an 1864 edition of Dickens' *Household Words* lamented, 'Victoria wants fencing in; this island wants hammering flat' (Anon. 1864:186) and miners who set out to conquer the terrain to bring water to their claims proved the aphorism daily.

## BUILDING THE WATER RACE: FINANCING

Constructing water races represented a bigger problem than merely mastering topography; miners had to forgo other, more immediately remunerative (but presumably lesser) mining

1. The *Grey River Argus* offers a simpler definition than the 1866 Gold Fields Act: 'a sluice head comprises 20 inch with 7 inch pressure, which is estimated in round numbers to be half a cubic foot of water per second; this running continuously for ten hours gives 18,000 cubic feet, or nearly 112,500 gallons of water to a head' (20 January 1873:2).

opportunities. They had to pay for tools and engineering expertise plus, in bare treeless Otago, supplies of expensive wood and had to finance food and fuel for up to a year or more. A report in the *Otago Witness* put the cost of water races at £50–60 per mile for a small, 2–3 head race, emphasising that such costs were considerably higher if difficult ground had to be traversed and adding that recent projects had significantly exceeded this estimate: McAuliff's 5 mile (8 km) race on the Teviot required three-quarters of a mile (1.2 km) of wooden fluming along a gorge, consuming 8000 feet (2430 m) of timber and nine months of construction time and cost £800, while the Grand Junction water race at the Upper Shotover, although only 2.5 miles (4 km) in length, took a year to construct and 25,000 feet of timber (7600 m) to complete (*Otago Witness* 22 October 1864:1). Analysis of these costs must be considered in light of a prevailing gold price of around £3–13 per ounce and an average weekly wage for skilled labourers at about the same rate.

Financing was problematic. In the early days, merchants simply extended credit to local miners while they built a race (Bremner 1988:15). But as the rush expanded, the business environment became more sophisticated and the population swelled, this informal financing could not continue. What emerged was a system of complex arrangements based on that practised in Victoria, with 'sleeper' investing shareholders and 'working' shareholders combining to see a project through (*Otago Witness* 12 August 1865:11). Under this system each held an equal share, 'sleepers' continuing their trade or business while contributing the equivalent of a labourer's wage to the company account, while 'actives' dug the water race and drew a wage. This system was employed by the Nil Desperandum company in 1864 (*Otago Witness* 8 October 1864:13) and the Aurora sluicing syndicate at Bendigo (Otago) in 1866. Most sluicing ventures were relatively short-lived until John Ewing brought an industrial-scale focus to Surface Hill at St Bathans in 1880 (McCraw 2009:25).

A third system of financing was rarely used due to the economic burden involved, but featured miners with sufficient reserves employing labourers to construct their race, then working the claim on their own account as soon as the water flowed. The advantage was that earnings were not diluted by other shareholders; the disadvantage was the very large financial reserves required before construction began and all the risk was the miners' own. This was the system employed by the syndicate which is the subject of this paper, but how they had the wherewithal to do this remains a mystery.

## BUILDING THE WATER RACE: CONSTRUCTION

In the early days, the process of building water races was predominantly the preserve of gold miners acting as engineers and surveyors, although this would change with the development of large shareholder or government-backed projects like the Ida Valley, Bannockburn and Carrick race companies of the 1880s. Small groups of men wielding shovels, pickaxes and rudimentary surveying equipment built water races criss-crossing the landscape of Central Otago, and the continued use of these for agricultural purposes today testifies to the quality of their construction.

James H. Hackett, the engineer geologist who travelled with Dr James Hector on many of his expeditions was asked to write a column for the *Otago Daily Times* detailing how to build a race (*Otago Daily Times* 30 January 1865:5). He began by describing two projects offering salutary lessons: one involved (in his opinion) wasted time and energy to cut a race along a rock-bound valley for several miles, when a strong dam at the mouth of the creek would have given ten times the

supply at a fraction of the cost; a second took six men five months to complete and due to a capricious supply, provided a fraction of what was required.

Hackett recommended using professional surveyors, but admitted that this was seldom viable for mining syndicates with limited means. In his article he described how to build a race and detailed how, as well as brute force and basic digging tools, the main piece of equipment was a triangle, made of three pieces of batten in the shape of an inverted V with a bar placed across and a lead 'plum' hanging from the top point to below the crossbar. The centre of the crossbar was marked so that the plum line passed through the centre and a sight was able to be taken along it. This afforded the precise measurement of the critically important 'fall' of the water race, generally between 4 and 8 feet to the mile (1.2–2.4 m to 1.6 km). The control of water velocity and the avoidance of quantities of standing water which prompted leaks and breakages were significant in the construction. According to Australian archaeologist Michael Tracey (1997:12–13), not only the velocity of the flow was critical, but its consistency mattered too:

If the velocity of the flow increased and by decreasing the slope or gradient, the flow became unstable, and transition from laminar to turbulent or dynamic flow took place ... eddies formed and transferred momentum over distances varying from a few millimetres, to several metres eventually causing erosion of the race walls and basal layer.

Tracey describes a goal of 'Super Critical Flow' in the race, identifying the twin problems of dynamic flow and laminar flow, where in the former 'too much of an angle on the race bed will rapidly erode the race, waste water and eventually destroy the race' and for the latter, 'too narrow of an angle on the race bed will slow the water and transported sediments will eventually settle and fill in the race' (pers. comm. 20 April 2012).

Hackett described the process of building the race as cutting a small ditch for a quarter of a mile in advance and allowing water to run through, thereby softening the ground for proper cutting and allowing a check of the levels. When covering ground that was 'gravelly', he recommended that the fall be reduced to prevent eroding the sides and that the area of the water race traversing such ground had to be heavily lined with clay built up over days of careful packing by the builders. When the race was opened, the first water sent down was always heavily thickened with mud to reline the entire length, a process that was regularly repeated to maintain the race.

Where steep gullies or water courses had to be crossed or rocky spurs had to be traversed, box fluming or iron pipes were employed (examples may be seen on State Highway (SH) 8 in the Cromwell Gorge, 9.4 km south of the intersection with SH8A). If the sides of the hill were too steep to facilitate a benched terrace, dry stone ledges were built up to carry either the race or box fluming (Figure 1). The ingenuity of the race builders was almost limitless. Tunnels or slots were bored through solid rock (Figure 2), wooden flumes bridged wider streams or traversed rock-bound gorges, and canvas pipes were suspended from wire ropes suspended over chasms too wide to bridge, like Jack Garrett's claim near the Roaring Meg taking water across the Kawarau Gorge to otherwise unworkable ground (Clyde Warden's Court, Paddon et al. 1864).

At the terminus of the race near the sluice face, the flow of the water race was conveyed into pipes (at first, canvas, then bituminised cardboard and later cast iron). Tracey refutes the frequently expressed belief that it was the slope of the water race that generated pressure for sluicing, stating instead that



Figure 1: Rise and Shine water race showing stone embankment and terracing. Shar Briden, Department of Conservation, Dunedin, Matakanui Station Tenure Review files, 2011.

'the water pressure for sluicing was generated by the head of water contained in a water tower or pipe combined with the eventual constricting of the flow of water by a reduction in the diameter in the pipe itself and in the monitor, giant or nozzle' (1997:6). The water guns played on the wash face to bring down the alluvium into the tail race, built to take advantage of the slope and to facilitate both the trapping of gold and the washing away of the spoil. Teams of miners worked in the freezing mists of the hose's wash, breaking up concretions



Figure 2: Rise and Shine water race showing stone cutting. Shar Briden, Department of Conservation, Dunedin, Matakanui Station Tenure Review files, 2011.

with picks or hammers and using sluice forks to lift large stones away, all the while aware that if the hoseman inadvertently overloaded the gravel sluice face they worked under, they were imperilled by the possibility of a slump. Such fears were hardly groundless, with Central Otago newspapers recording many deaths of miners caught under 'falls of earth' at sluicing claims.

Where syndicates worked well-chosen ground, utilising expertly-built, constantly-filled water races and where the tail races carefully sited and the equipment deftly used, sluicing claims could pay high returns and made some miners wealthy. At Bendigo, the Rise and Shine syndicate remained profitable for over three decades.

## THE RISE AND SHINE SLUICING SYNDICATE

Rise and Shine Creek is a minor watershed in the catchment of Bendigo Creek on the western flank of the Dunstan Range (Figure 3). It was ignored by early miners at Bendigo, because there was insufficient water and its gold was, even by the 'tucker' yields of Bendigo Gully (Otago Witness 15 July 1865:11), sparsely distributed. No doubt prior to 1864 the area was tried, given the proximity to the old Māori trail over the Dunstan range at Thomsons Saddle used by miners heading for the Arrow and Shotover, but no-one found enough gold to stay.

In mid-1864 this changed. In a development that would prove to be a boon to alluvial miners downstream in Bendigo Gully, a group of mainly Swedish men living at Bendigo and Rocky Point identified the Rise and Shine Valley as good sluicing country. Christian Hanson, Albert Perry, Charles Abelsted, Henry Featherstone, James Peace and Donald Dryborough came up with an ambitious plan (Clyde Warden's Court, Hanson *et al.* 1864). They planned to fix the problem of insufficient water on their side of the hill by bringing it from the other side of the ranges, using the headwaters of the Tipperary Creek (now Clearwater Creek), which was at a higher altitude and south of Thomsons Saddle (Figure 4).

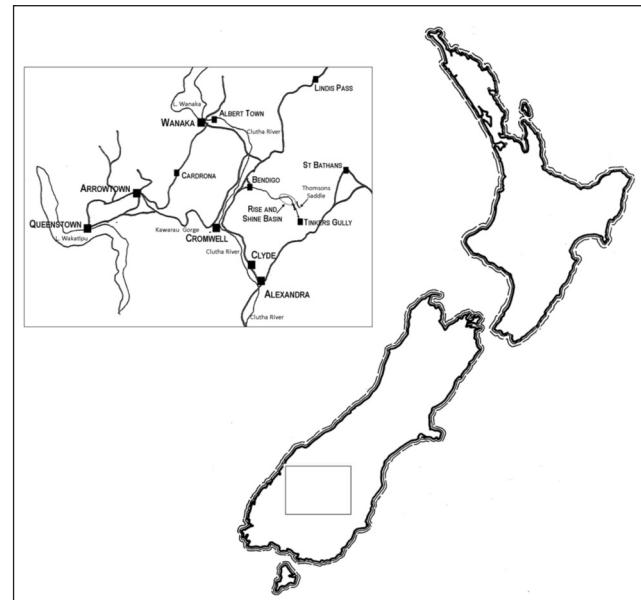


Figure 3: Location map, Rise and Shine valley area.

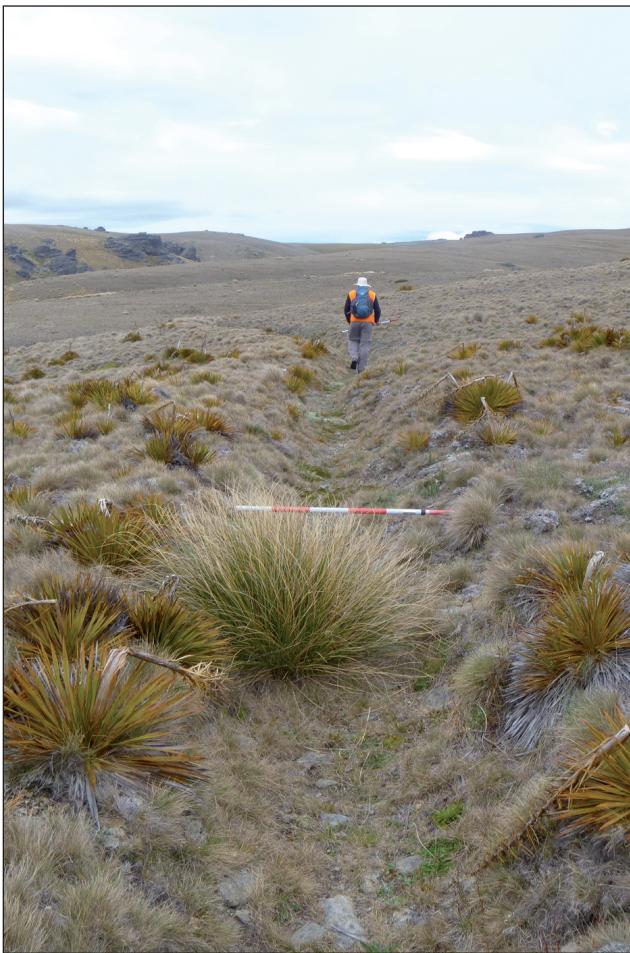


Figure 4: Rise and Shine water race, Matakanui. Shar Briden, Department of Conservation, Dunedin, Matakanui Station Tenure Review files, 2011.

After a few months, they discovered to their chagrin that they had followed bad advice. The shepherd they consulted about the extent of the snowline in winter had proffered the wrong information (*Dunstan Times* 26 October 1866:2): they had expended a great amount of effort and money, only to find that they were above the winter snow levels, and the race would be frozen for half the year. They abandoned that work and began again, with a head race 3 miles (4.8 km) lower than the first one. Both the abortive attempt and the main race can still be traced on the landscape, and the race is marked on contemporary maps of the Matakanui sheep station.

Intake levels sorted, they got on with the building of their race. Not much is known of these men of the Rise and Shine Company, as they came to be known. They had sufficient resources available for them to declare on their January 1865 application that they had 20 men working for them on wages (Clyde Warden's Court, Abelstet *et al.* 1865). This was no small undertaking, requiring a wage bill of at least £50 per week to be covered by the resources of the organisers and building a massive water race which, when completed, would be nearly 11 miles (17.7 km) long and took around eight months to finish.

In April 1865 newspapers noted miners moving to Bendigo to take advantage of the increased water flow to develop alluvial claims in the lower Bendigo Gully (*Bruce Herald* 13 April 1865:9). By November the race was fully operational, the Rise and Shine were sluicing and miners lower down in Bendigo Gully were celebrating 'an abundant supply of water to the gully' (*Otago Witness* 2 December 1865:13).

## DOWNSTREAM BENEFITS

The Rip and Tear syndicate took advantage of the increased water flow downstream from the Rise and Shine race. In November of 1865 (*Dunstan Times* 26 April 1867:3) they concluded that the rock-choked narrows of Bendigo Creek's gorge (an area between Bendigo Gully and where the gorge debouches onto the flats breasting the banks of the Clutha River) concealed gold reserves. In what was called 'a most trying [work], both to the patience and purse,' they piled stones, shifted boulders and dug out a new channel for Bendigo Creek and using the increased water, processed the former stream bed to find that 'the gold may be plainly seen in the wash dirt from the surface to the bed rock.' (*Dunstan Times* 16 August 1867:2). They also unblocked the natural rock bridge which had periodically dammed the gorge, causing havoc in Bendigo Gully (Figure 5). After a year reshaping the gorge and stream bed, they enjoyed several months of reward, becoming what the *Dunstan Times* described as 'the most important claim in the old [Bendigo Gully] workings' (18 February 1868:2). However, when they were about half-finished, a flood obliterated their work, mixing unprocessed wash dirt with the stones they had moved aside. It is not clear whether they rebuilt their work or abandoned it, because nothing more is reported of the Rip and Tear men and only the rock bridge they cleared remains of their work in the gorge (Figure 5).

Meanwhile, the Rise and Shine miners began to enjoy the fruits of their labour and announced that their race carried the 12 sluice heads of water allowed under their license (*Otago Daily Times* 13 September 1866:5), sufficient to work two parts of their claim with sluicing guns (*Dunstan Times* 26 April 1867:2). They were immediately profitable, the local papers noting that the company had full rights to the only water in the area, allowing them to work throughout the valley at will. This is reflected in rising share prices as syndicate

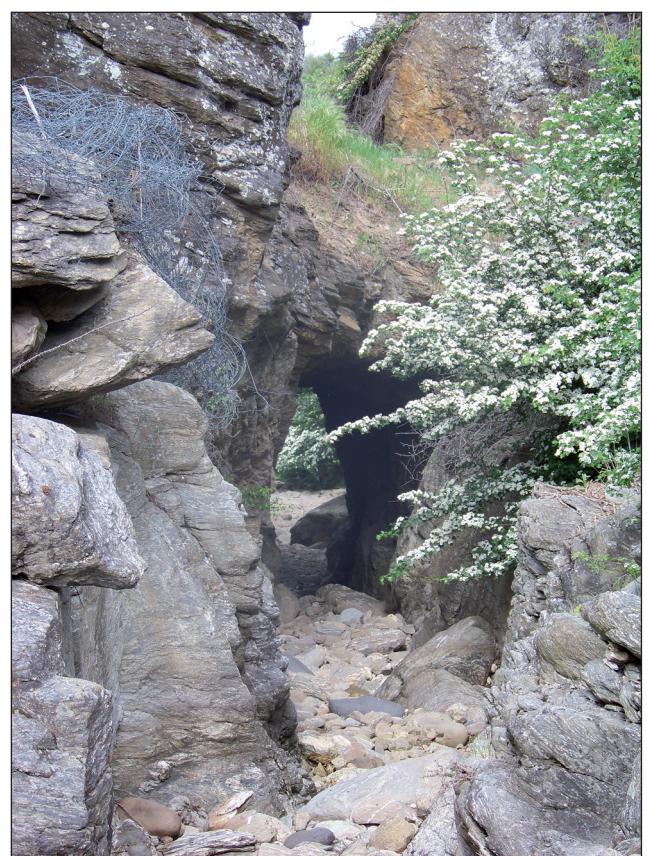


Figure 5: Bendigo Gully rock bridge.

members changed. In December 1865 Henry Featherstone sold his sixth share to his partners for £35 (Clyde Warden's Court, Featherstone 1865); in January 1866 Alfred Perry sold his share to John Jones for £50 and then in June, when the syndicate expanded to six shareholders again, Ellis Thomas paid £80 for his share (*Otago Daily Times* 17 May 1866:4).

The appearance of Logantown at Bendigo with five hotels, three grocers, a bakery, restaurant and butchery in late 1869 (*Cromwell Argus* 15 December 1869:2) spurred the company to build a 4 mile (6.5 km) bridle track from their claim area to the new town. In mid-1870 this track would be widened into a dray road by the Alta Quartz Mining Company to cart quartz to the Aurora battery near Logantown at Bendigo and it is easily followed today.

By 1870, the Rise and Shine had such a good supply of water that they were able to work in three parties, utilising wage men as well as their own labour. Their claim paid consistently, with each of the shareholders earning the substantial wage of £7-10 per week (*Cromwell Argus* 12 October 1870:2). Warden Vincent Pyke describes them as 'noteworthy for their engineering and success' and commented on their 'application' and 'enterprise' in his reports (*Otago Witness* 14 May 1870:15).

## QUARTZ GAMBLERS IN THE RISE AND SHINE

In late 1869, downstream from the Rise and Shine workings, Welsh miner Sam Williams discovered auriferous quartz at what became known as the Alta claim. The Rise and Shine were happy to rent their tail water to the new venture, but carried on sluicing. When it came to quartz claims, Bendigo was a place which attracted fevered speculation and rash investment decisions as quartz prospectors sought to emulate the spectacular successes of Thomas Logan's Cromwell Company (Carpenter 2011:48). Every company that is, with the exception of the Rise and Shine.

But gold-bearing quartz was nearby. In 1871, a year after a bewildering series of boom-and-bust quartz claims were worked in the Bendigo hills, a reef was found east of the Rise and Shine; 2 miles (3.2 km) above them and over the saddle in Thomsons Creek (*Otago Daily Times* 19 January 1871:3). Given the dearth of paying quartz claims, the Rise and Shine men seem to have shrugged and carried on with their sluicing claim. And in a continuing reminder of just how valuable their water resource was, in mid-1871 it was rented a second time, this time by the Koh-i-noor syndicate who constructed a race to sluice the low-lying spurs between Shepherds Creek and Bendigo. Their intake was just below the outfall for the Alta Company's quartz mill, and took about one-third of the available flow (*Cromwell Argus* 23 May 1871:3).

Visitors to the area will find the Shepherds Creek/Rise and Shine water race relationships confusing, as this 1871 race, built to take water *into* Shepherds Creek is separate from another built in 1880 to the east *from* Shepherds Creek to provide clean water for the Come in Time battery (*Cromwell Argus* 31 September 1880:2). The latter race may be traced around to the east of the Come in Time open-cut to the north of the Come in Time car park on the Thomsons Gorge Road, while the former may be seen snaking across the hillside towards the west from near the battery site, viewable from the walking track to the Alta site on the opposite side of the valley.

The conservative development of the Rise and Shine ground does not mean that the shareholders were geologically ignorant, and they realised that the gold they were getting, given that it sometimes had quartz adhering to the flakes, had its origin in a reef nearby (*Cromwell Argus* 11 June 1872:2).

In July they uncovered it on the eastern side of their claim. The *Cromwell Argus'* local correspondent erupted into paroxysms of joy, declaring that this reef was 'likely to prove the greatest discovery, so far, in the annals of quartz-reefing in Otago', confidently declaring 'that machinery will be immediately erected, the company possessing a never-failing water supply for motive power' (*Cromwell Argus* 4 July 1871:3). His barely-suppressed excitement continued in the weeks following, describing the discovery as 'valuable' and highlighting that he had inspected the reef himself, declaring that 'the reef shows no diminution, either in width or prospect' (*Cromwell Argus* 18 July 1871:2). The rival *Dunstan Times* provided a little more balance, noting in August that the Rise and Shine men remained sluicing and that while they had found a reef, nothing more was done about it (*Dunstan Times* 18 August 1871:2).

The prospects of reef development prompted the Rise and Shine men to construct a dray road through their claim, allowing further exploration of the reef system athwart their sluicing area. They continued to expand their sluicing (*Cromwell Argus* 22 August 1871:3) and by September 1871 the Rise and Shine was the only sluicing company working at Bendigo (*Dunstan Times* 1 September 1871:2). The rest either gave up as returns fell or were prevented from working by the Cromwell Company's legal entitlement to clean water at their battery at the mouth of Bendigo gorge (*Dunstan Times* 18 March 1870:3). When the Solway battery was moved up to the Matilda site in 1879, sluicing resumed in Bendigo Gully and was profitably pursued there into the 1890s by Chinese and European miners (Hamer and Soper 1934).

The presence of 'a proven reef' had newspapermen fulminating against the caution of the Rise and Shine men. The same writers who would later lambast the Alta Company for rashly and prematurely erecting machinery on unproven ground, seethed with frustration at the deleterious hesitancy on the part of the Rise and Shine. Determined to thoroughly prospect their discovery before carrying out any expensive development, the Rise and Shine men sank prospecting shafts and organised assays of the resulting stone. Their main shaft was, they announced, 'to be sunk to a depth of 50 feet [15.2 m] and another is to be put down on the side of the range, some distance away' (*Cromwell Argus* 24 October 1871:3). The *Argus* kept up their campaign of trying to nudge them into action, declaring that their 'reef still keeps up its excellent character as the shaft deepens. I think it's paying nature is already proved beyond a doubt' (*Cromwell Argus* 7 November 1871:3).

The Rise and Shine topography hindered communication and mine development. As they stripped the reef along the spur with sluice guns to gain a better idea of the extent of the auriferous stone, they loaded a dray for a trial crushing at the Alta mill. This trip of less than a mile (1.6 km) took two days and wrecked the dray (*Cromwell Argus* 7 November 1871:3). In the same week, Charles O'Donnell, with a team of six oxen, transferred a ton of coal from the ferry at Wakefield to one of the Rise and Shine households. It was, he reported, a trip which was 'mostly along a razor-backed ridge, so narrow, one wheel would be in Bendigo Gully, the other in Shepherds Creek' (*Cromwell Argus* 5 December 1871:2). Given the substantial work that developing their reef and erecting machinery in such terrain would require, and the known costs implicit in mining quartz, the caution shown by the Rise and Shine men is understandable. No reports were published on the result of the trial crushing, but the continuation of the newspapermen's campaign of lament at the syndicate's 'inaction' indicates that the result was not sufficient to induce them to abandon a proven revenue source for the lottery of a quartz claim (*Cromwell Argus* 19 December 1871:3).

Throughout the first half of 1871 the Rise and Shine Company were, for the first time in their history, blighted by a scarcity of water. They were forced to engage in smaller-scale box-sluicing and the under-utilisation of their manpower saw them renew their quartz interest, to the delight of the *Argus*. They sank two additional shafts, each to a depth of 30 feet (9.1 m), reporting that the ‘stone is very hard, but [that] gold visible throughout’ (*Cromwell Argus* 11 June 1872:2). Even with such a report, they ignored their quartz and when the water flowed again, they went back sluicing.

### THE CHINESE AT RISE AND SHINE

In 1872, the presence of Chinese miners in the area fed into local prejudices when the Rise and Shine’s tail race was supposedly robbed. Either the result of inattention due to quartz work, or, if the *Argus*’ Bendigo correspondent is to be believed, insufficient security at their tail race meant that an ominous loss was declared.

Surprised that their mid-year wash up yielded a smaller sum than they expected, the Rise and Shine men concluded that:

given the proximity of the newly-arrived Chinese miners, that their tail race had been robbed. Heavy gold had been noticed in the race, but was not there in the washing up, proving that an extensive robbery had taken place, as no European miners except the owners are in the locality, the Celestials may with truth be blamed. (*Cromwell Argus* 18 June 1872:2)

It is hard to tell if this report reflects the bias of a profoundly anti-Chinese correspondent or whether this reflected the belief of the Rise and Shine syndicate, but no charge appears in the Cromwell Police Occurrences Book and no suit was presented in the Plaints Record for the Warden’s Court.

### DROUGHTS AND DAMS

It was not until 1873 that the Rise and Shine Company were again hit by drought. Here again, the advantage of having the sole rights to the water – and effectively the land – allowed them to move to the lowest point in their claim and construct a dam to husband water overnight for use the next day (*Cromwell Argus* 22 April 1873:2). This dam may be found on a spur between the two main gullies in the Rise and Shine working area (Figure 6). Archaeologist Jill Hamel describes this as ‘a well formed reservoir 70 m long and 20 m deep, with an earth wall 3.4 m high in the middle and revetted in two steps on the outside’ (Hamel 1993:20).

This water shortage lasted until 1875, when faced with a brimming race, they divided into two parties, one using the water two-thirds of the distance up the gully, the other at its foot, where it was re-lifted and worked by the second party (*Cromwell Argus* 13 October 1875:3). In 1878, the massive floods that ruined so much mining and farming in the Clutha valley did not leave the Rise and Shine unscathed, clogging their tail-race (*Cromwell Argus* 8 October 1875:3). However, with what the *Argus* called ‘an inexhaustible supply of water commanding the largest area of auriferous ground of any water race in the district’, the ‘foremost sluicers in the region’ (24 December 1878:2) quickly cleared the flood damage and resumed operations with ‘satisfactory results’ for their half-yearly wash up (*Cromwell Argus* 22 June 1880:2).

A glimpse into the lives lived by these isolated miners is given in a report in the *Otago Witness* (22 October 1881:18) late in 1881:

The Rise and Shine sluicing party have been at work for many years in their claim nearly at the summit of the Dunstan Range. Their claim has always and is now paying good wages, and a more isolated and better contented party of miners cannot be found in New Zealand. With their wives and families they form a small, select, and happy community.



Figure 6: Rise and Shine dam and reservoir.

This long-running concern finally began to change in 1883, with the sale of one of the shares in the operation offered by founding shareholder James Peace. In the sale offer it is possible to see what an asset he and his confederates had built up over the years.

For sale, one fifth share in the "Rise and Shine" Water-race and Mining Property at Bendigo; also Furnished House with small garden attached, Wash-house and all necessary Out-buildings. This well-known property has been profitably worked by the same party for nearly 20 years, and the only reason for disposing of this is the owner is leaving New Zealand.

The Water-right (a never-failing supply from Thompson's Creek) gives the company a practical monopoly over many miles of known payable country. To anyone wishing to make a home for life this presents an opportunity but seldom met with. Bona fide purchasers can examine gold returns for many years past.

Apply James Peace, Rise and Shine Co, Bendigo (*Cromwell Argus* 16 October 1883:2).

The successful purchaser was William Gilbert Mouat, a quartz miner who had worked at Bullendale then as a leading hand in the Cromwell Company mine at Bendigo. In his journal, Mouat revealed that Peace bought a farm in Australia with his earnings. Mouat, a te reo-fluent (Māori language) grandson of Irihapeti Motoitoi and Richard Driver of Port Chalmers, received many Māori visitors to his new four-roomed house, showing them the contents, which included a stove, sewing machine and 'extensive outbuildings'. He gave his visitors clothes that Peace and his family had left behind, showing he kept to the tikanga (customs) of the treatment accorded to manuhiri (visitors) (Mouat 1998). Two years later, Gilbert's brother Dick also bought a shareholding and the two of them worked the claim with the remaining stalwarts of the Rise and Shine.

The Mouats record another incident with local Chinese allegedly robbing their tail-race, Gilbert catching a group scooping out wash-dirt by candle-light. The force of their response led to an appearance before the warden, but the Mouats were excused on account of provocation (Mouat 1998).

The Rise and Shine kept on mining and stayed out of the newspapers until 1888, when sluicing magnate John Ewing purchased a one-sixth share in the Rise and Shine from the now elderly Ellis Thomas (*Otago Witness* 10 February 1888:12).

## THE END OF THE ENTERPRISE

Ewing was developing his massive sluicing claim at Tinkers and proposed to the remaining Rise and Shine men that they share their water right with him, splitting the flow between their sluicing area and a new race he would cut to Tinkers. The Rise and Shine syndicate had to choose: keep working their claim, which may have had falling returns after 25 years of exploitation, or make a deal with the rising star of the sluicing industry, John Ewing. In December 1888 they sold most of their water right to Ewing for £1400 (*Otago Witness* 7 December 1888:12; McCraw 2009:72) and 35 Ewing employees built a 3 mile (5 km) race to their ground. The remaining Rise and Shine men either retired, content to live in their homes off the returns of their years of work (Hanson and Russell lived in their homes into the late 1890s (*Cromwell Argus* 12 May 1896:5)), found work at the Cromwell Company's mine or continued sluicing on a small scale with

the remnant flow in the race (*Otago Witness* 8 October 1891:15). They could still sluice, since Ewing was prevented from acquiring all the Rise and Shine's water by rights held by the Jubilee Quartz Company working near the present-day cattle yards in Rise and Shine Creek. It is not clear who continued sluicing, but this could have been Mouat and his brother or Hanson and Russell. Either way, this effectively concluded the final chapter for one of the longest-lived, continuously-worked gold sluicing enterprises in the history of the Otago gold fields.

## THE ARCHAEOLOGY OF THE RISE AND SHINE

The Rise and Shine area had a number of quartz claims operating with a mixture of success and failure from 1870 to 1938, creating a scattering of distinctive mining detritus, from adits, open-cuts and shafts to battery foundations and mullock heaps (Figure 7). However, the sluicing area was always separate and as such offers a good range of typical alluvial mining archaeology. The race is traceable from its origin on Matakanui Station, across Thomsons Saddle and into the upper reaches of the Rise and Shine basin.

Every part of the basin was tested in some way by the Rise and Shine miners; however, their main efforts were concentrated on two shallow gullies on the true left of the stream which have been sluiced down to a depth of between 3 and 6 m and up to 90 m from the initial face (Figure 8), a large shallow tailings fan spreading into the valley from each. Each has a complex system of water races and feeders which were adapted to provide water as the gullies were developed (Figure 9). The alluvium did not have large rocks, so the tailings are not formed into 'herringbone' patterns, but the sorting and removal of stones from clay can be seen in tidy debris piles in the middle of each gully.

The dam with its revetted walls, system of interconnected reservoirs and feeder races is still an impressive site and several tangible items of the enterprise remain scattered around, including a heavy piece of iron fluming and bands from barrels and wheel rims.

In her 'Rich Fields of Bendigo', Jill Hamel provides a survey of the archaeology of the area. It details the work of Jacomb and Easedale in 1980, Hellebreker and Moffitt in 1983 and her own survey in the early 1990s (Hamel 1993:18-21). Hamel describes several houses, but this is problematic. Mouat's description of the four-roomed house he purchased is different to the scattered single-roomed structures there today. The eight or nine stone cottages identified are humble in size and construction, typical of miners' Bendigo dwellings and none have the outbuildings that Peace advertised. This is not the only reference to large dwellings; as early as 1871 a report in the *Cromwell Argus* (22 August 1871:3) described shareholders 'making additions to their already substantial residences', which reinforces the difference between the standing remains and the contemporary descriptions (Figure 10).

Mouat also writes about a 'Chinese village', although this is not mentioned in contemporary newspapers. Chinese miners were working the upper reaches of Thomsons Creek in early 1871 (*Cromwell Argus* 22 August 1871:3) and in 1880 found an auriferous reef (*Cromwell Argus* 4 May 1880:2), but it is unlikely there were more than a dozen or so Chinese miners, given the lack of reference to a larger population in the warden's returns. The most likely candidate for a 'village' is the small collection of house remnants, 3 miles (4.8 km) from the Rise and Shine sluice area, over Thomsons Saddle and upstream from a musterer's hut on Matakanui Station.

LOCATION MAP: THE RISE AND SHINE SYNDICATE, BENDIGO, OTAGO

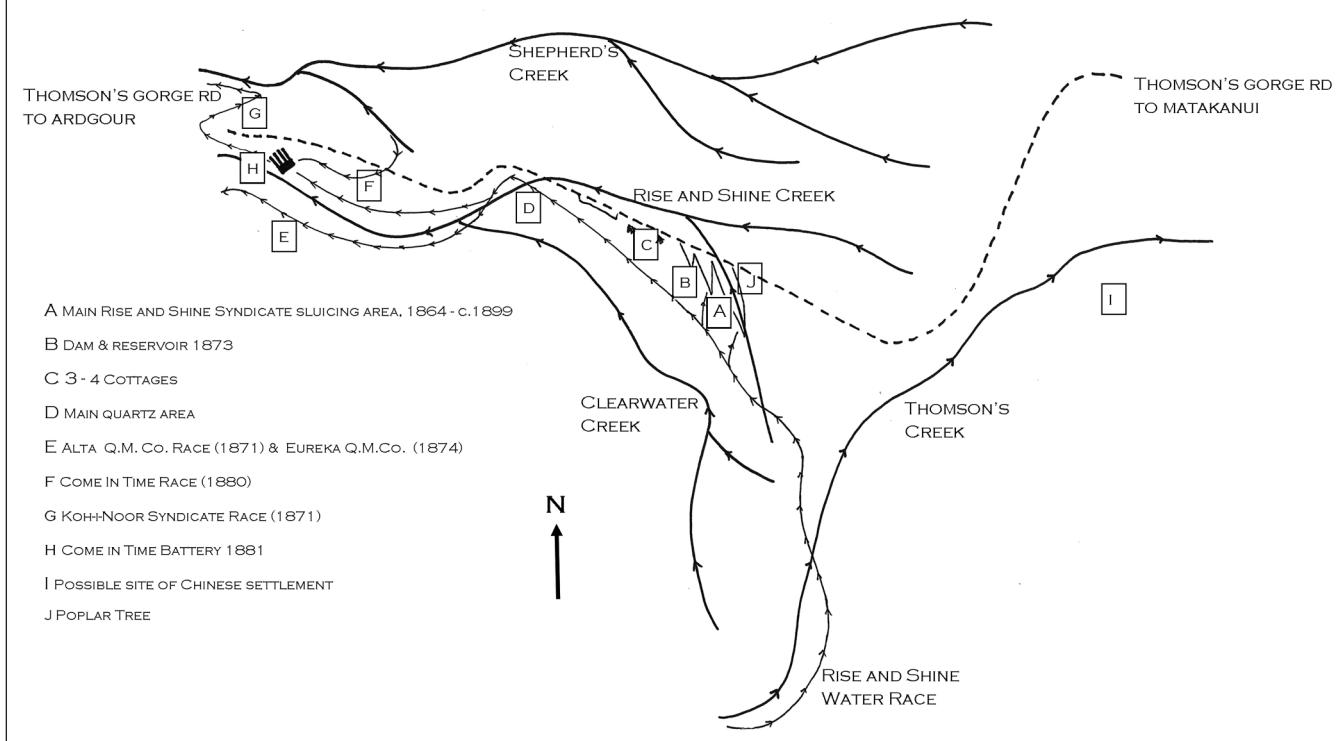


Figure 7: The Rise and Shine Basin, showing water races and quartz areas.

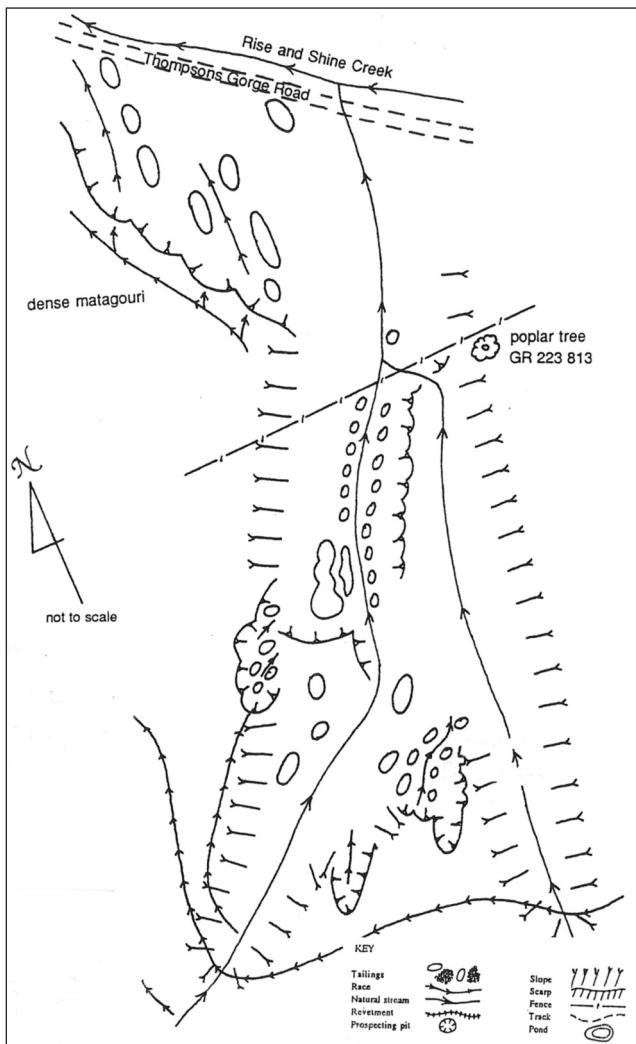


Figure 8: Eastern sluicing area, Rise and Shine basin (Hamel 1993; used with permission).

Figure 9: Western sluicing area, Rise and Shine basin (Hamel 1993; used with permission).

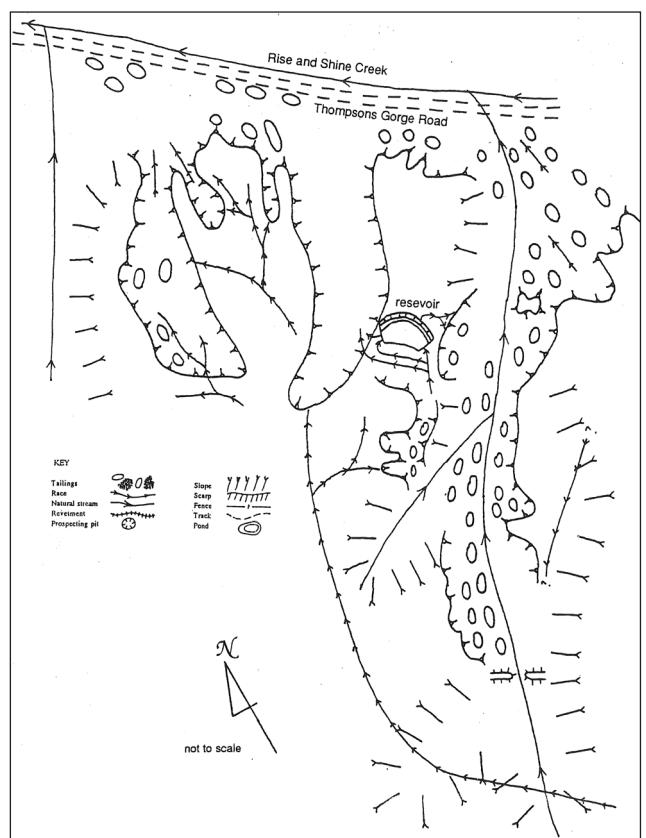




Figure 10: Miner's cottage, showing revetment at front, Rise and Shine basin.

Department of Conservation archaeologist Shar Briden has identified these as Chinese, given the presence of typical ceramics in one of the huts (pers. comm. 1 May 2012).

## CONCLUSION

The most important archaeology in the Rise and Shine Basin is not the stone cottage ruins or the detritus of quartz mining; it is the nearly-invisible line which modestly crosses the landscape on the true left of the stream: the Rise and Shine water race of 1864–1899. This race allowed a group of miners to develop a 35-year mining endeavour; it provided the means to turn Bendigo Gully from a difficult, poor man's field into one which could be worked for solid, if not spectacular wages and allowed the Koh-i-noor and Rip and Tear syndicates to change the landscape in their areas.

Water races are the most significant heritage of alluvial gold fields, as the history of the Rise and Shine water race illustrates. Examination of the spectacular landscapes at Department of Conservation reserves centred on the Northburn herringbone sluicings and at Bannockburn reveal a dramatic, yet incomplete part of what may be found there: the full story is only possible when considering water use. Water allowed sluicing claim development and facilitated development of hydraulic elevation to extract gold where the topography defeated sluicing and also powered quartz batteries, mine pumps and ventilation.

For the duration of the Central Otago gold rush, water was the conduit for the transformation of miners' fortunes and the countryside they wrought, in the same way that water is transforming the landscape anew for the modern bonanza, the cultivation of the world's best pinot noir vines.

## FURTHER READING

Peter Petchey's 'Port's Water Race (D46/143), Longwood Range, Southland: The Archaeology & Interpretation of an Extensive Water Race System', *Archaeology in New Zealand* (45(4):223-234, 2003) includes the method for calculating water race volumes; Neville Ritchie's 'Archaeological Interpretation of Alluvial Gold Tailings Sites, Central Otago, New Zealand' in *New Zealand Journal of Archaeology* (1981 3:51-69) surveys scarp development, tailings deposition and distinctive patterns found on sluiced landscapes.

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