



Archaeological survey of the Arrow River and Macetown, Otago

Peter Petchey



Department of Conservation
Te Papa Atawhai

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Published by
Department of Conservation
PO Box 10-420
Wellington, New Zealand

Cover photograph

The All Nations aerial cableway and return wheel. *Photo: P. Petchey.*

This report was prepared for publication by DOC Science Publishing, Science & Research Unit; editing and layout by Lynette Clelland. Publication was approved by the Manager, Science & Research Unit, Science Technology and Information Services, Department of Conservation, Wellington.

All DOC Science publications are listed in the catalogue which can be found on the departmental web site <http://www.doc.govt.nz>

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ISBN 0-478-22330-7

National Library of New Zealand Cataloguing-in-Publication Data

Petchey, Peter Graham.

Archaeological survey of the Arrow River and Macetown, Otago /
Peter Petchey.

Includes bibliographical references.

ISBN 0-478-22330-7

1. Gold mines and mining—New Zealand—Queenstown-Lakes
District—History. 2. Historic sites—New Zealand—Queenstown-Lakes
District. 3. Macetown (N.Z.)—History. 4. Arrow River Region (N.Z.)—
History. I. Title.

622.3422099395—dc 21

Book printed on recycled paper by Pronto Group Printers, Wellington, New Zealand.

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ABSTRACT

The area around the Arrow River and Macetown in Otago, New Zealand, is archaeologically and historically rich and important. The present Macetown Historic Reserve protects some of the most important features of the area, namely the township site, Anderson's Battery and the Homeward Bound Battery, but a great deal lies outside the reserve boundaries. To fully interpret the gold mining history of the area, the whole archaeological landscape needs to be considered.

This report presents, in some detail, a record of the mining archaeological remains in the area. Maps of the site complexes have been prepared from purpose-flown, low-level aerial photographs, observations of ground controls and detailed ground checking and drawing. Some features will have inevitably been missed, but the overall coverage is good. The remains of numerous mining operations have been recorded, including battery sites, hut sites, tramway formations, aerial cableway remains, adits, shafts, mullock heaps and items of mining plant. Included in the survey is the site of New Zealand's highest goldmine, the Sunrise, at nearly a mile high.

It is hoped that the information presented here can fulfil a number of roles. It provides a permanent account of the archaeological record of Macetown; it can be used as a management tool for the conservation of the historic features presented, some of which will have a limited existence; and it can be used as a basis for further archaeological research.

Keywords: Colonial, nineteenth century, history, gold, industrial archaeology, Wakatipu, Macetown, Twelve Mile Creek, Rich Burn, mining technology, aerial cableway, stamper battery, cyanide process, Otago, New Zealand, pastoral lease, resource management, aerial photography.

1. Introduction

The Arrow River flows out of the Harris Mountains to emerge into the Wakatipu Basin near Arrowtown. For some 60 years, there was a small isolated township on the banks of the river deep in the mountains. This township—Macetown—existed only to service the cluster of alluvial workings and hard-rock gold mines that had established on Advance Peak, the spurs of Vanguard Peak and along the Rich Burn (or Twelve Mile Creek) and the Arrow in the late 1800s and early 1900s. In 2000/01, the archaeological survey described in this account recorded the remains of Macetown and the mines that gave it its life, and whose ultimate failure sealed its fate.

Historically, much of the length of the Arrow River has been worked for gold, with the most extensive workings being near the confluence of the Arrow and the Rich Burn. This was the site of extensive alluvial working in 1862 and 1863, and later the upstream areas became an important quartz (hard-rock) mining locality. The area contains significant archaeological examples of both alluvial and hard-rock gold mining, as well as the well-known ‘ghost town’ of Macetown. Some of these remains, including the township site, are contained in the Macetown Historic Reserve.

The exact nature and extent of the mining archaeology around Macetown had not been documented and this survey was commissioned by the Department of Conservation to redress this situation, and to supply detailed information about the archaeological landscape for interpretation and management purposes. The survey was based on a combination of aerial photograph interpretation and ground inspection of sites. Some 30 days was spent in the field by two or three people at a time, camping at the site of Macetown. The main output of this work is a series of detailed maps of the Macetown and Rich Burn areas. This written report provides background and description for these maps. It should be noted that more archaeological evidence of gold mining exists both upstream and downstream of the surveyed area.

2. Geographical description of the survey area

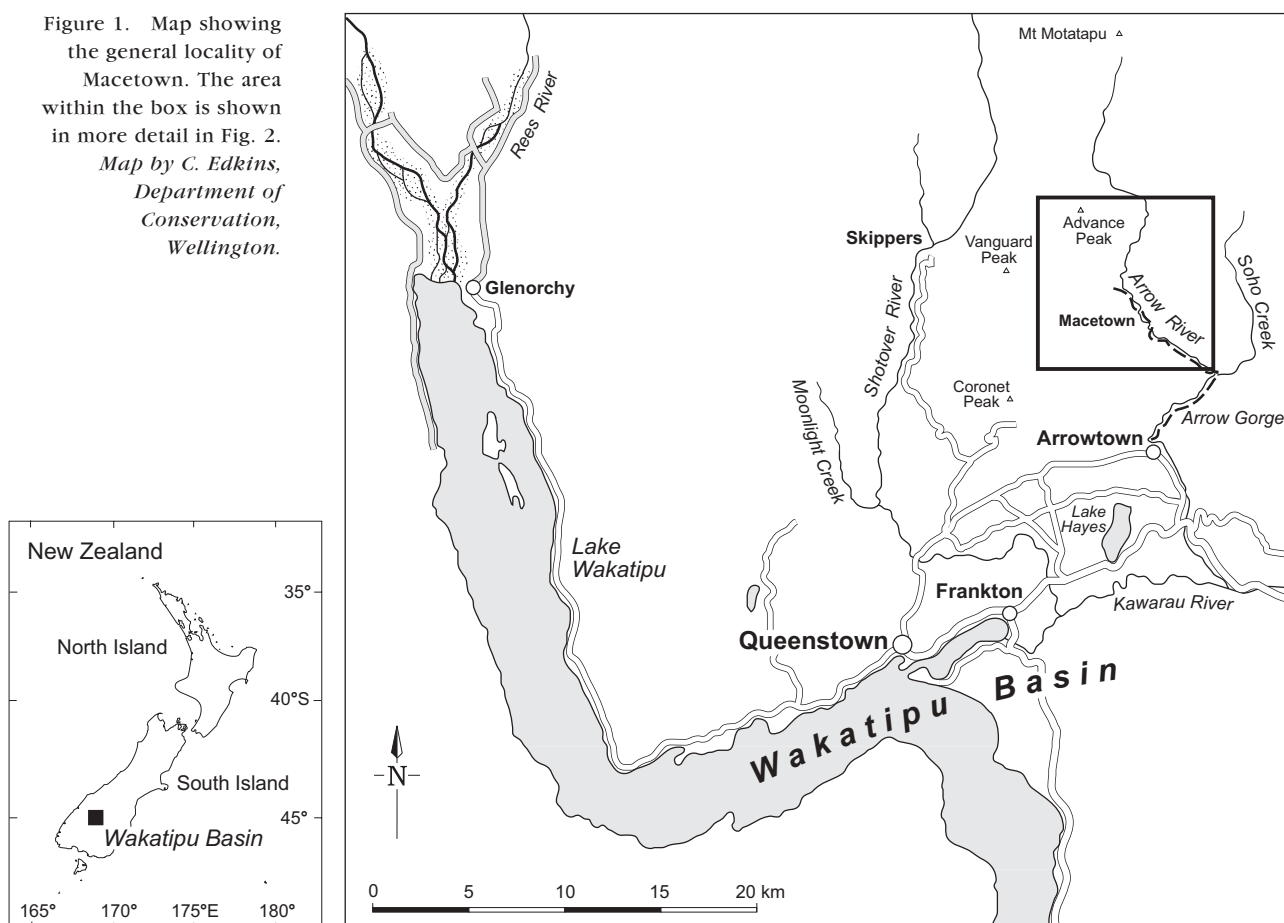
The Arrow River rises to the south of Mount Motatapu in the Harris Mountains, and runs generally south to emerge into the Wakatipu Basin at Arrowtown, before finally meeting the Kawarau River (Figs 1 and 2). It mainly flows through steep mountainous country, with numerous small- and medium-sized tributaries, of which the most notable are Soho Creek, the Eight Mile Creek and the Rich Burn.

An area of extensive natural river terraces at the confluence of the Arrow and the Rich Burn (also known as the Gold Burn or the Twelve Mile Creek) became the focus for alluvial gold mining operations as well as the site of the town of Macetown (Figs 3 and 4). Extensive alluvial workings were also located on the hillsides above the township, and in many places along the bed and banks of the river. The insides of many bends show evidence of small-scale alluvial mining.

To the northwest of the site of Macetown, Advance Peak rises to a height of 1749 m. On the summit and just below it are the Advance Peak mines, which were the highest in New Zealand when they were in operation. To the south of Advance Peak and the Rich Burn, on the spurs of Vanguard Peak, are the main Macetown reefs, running roughly northwest to southeast. Several streams cross

Figure 1. Map showing the general locality of Macetown. The area within the box is shown in more detail in Fig. 2.

Map by C. Edkins,
Department of
Conservation,
Wellington.



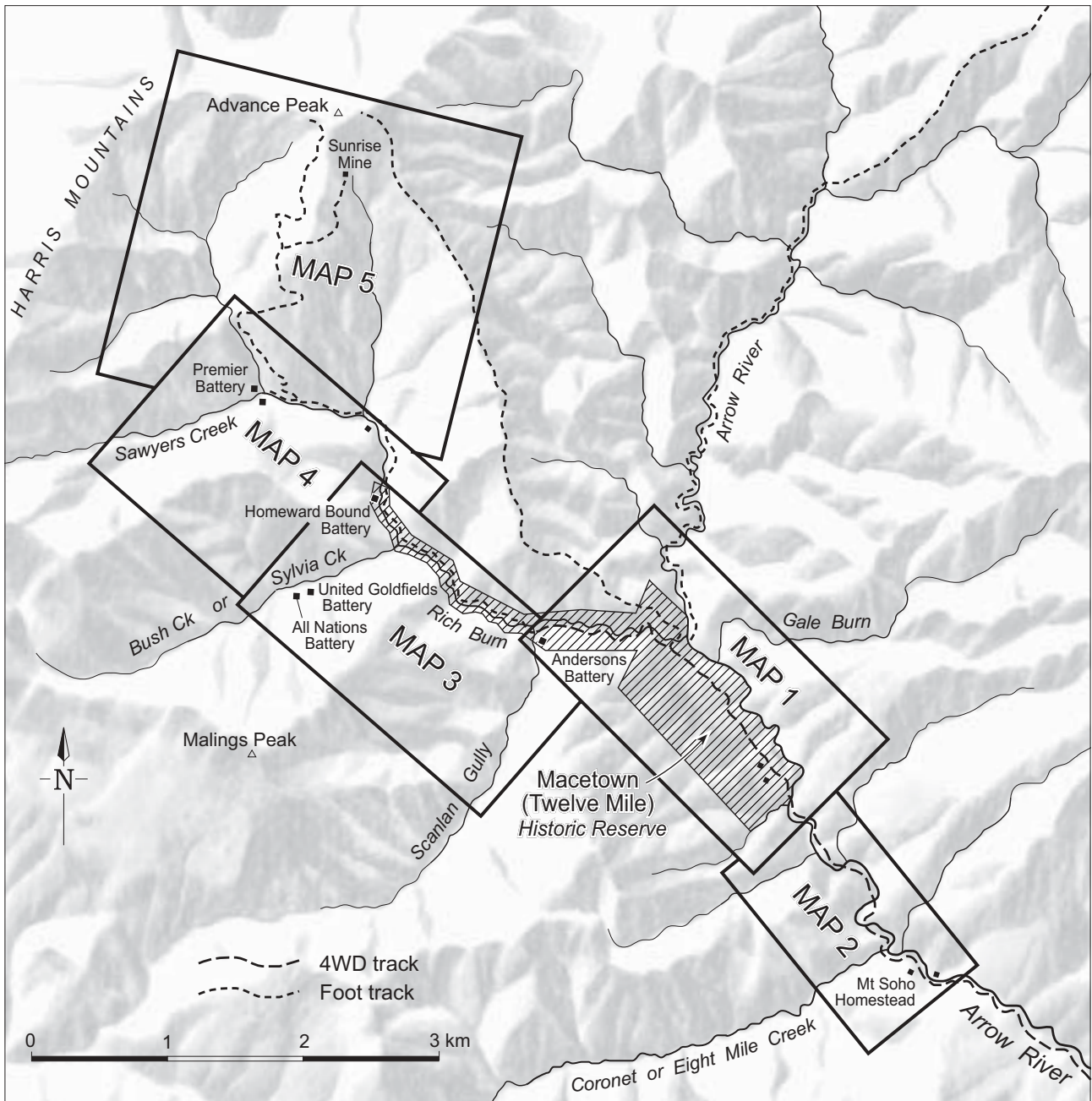


Figure 2. Map showing main geographical features of Macetown. Overlays show areas covered in the survey maps presented in this report.
 Map by C. Edkins,
 Department of Conservation,
 Wellington.

this area (Sawyers or Sawyer's Creek or Gully, Sylvia Creek and Scanlan's or Scanlan Gully), and both their banks and their intervening ridges contain extensive archaeological evidence of hard-rock mining systems. These streams feed into the Rich Burn, along the valley of which the main access road to the mines ran.

The country is generally open, with tussock and scattered speargrass being the usual vegetative covering. Matagouri and sweet briar are common in places, while broom is present but is being controlled within the area of the Historic Reserve. The area of the Macetown settlement is well known for its cultural plantings of exotic trees, with daffodils and bluebells appearing in the spring. While a number of fruit trees still bear fruit, it is noticeable that many of them are becoming old and dying, and are being replaced by more vigorous exotic species such as sycamores.

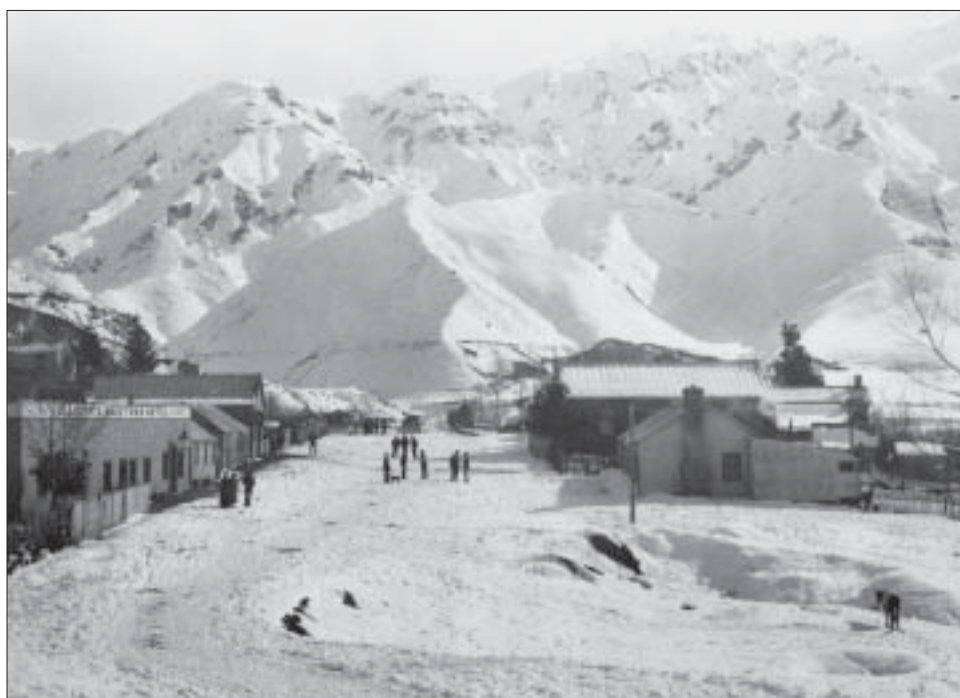
3. General history of Macetown and the Arrow River goldfields

A number of published and unpublished accounts of the history of Macetown and the Arrow River goldfields exist. Brief specific histories have been published by Beaton (1971) and the Department of Lands and Survey (n.d., since re-issued by the Department of Conservation). Detailed accounts of the history of mining in the area have been prepared by Powell (1976) and Veitch (1972), although both of these are unpublished. Numerous general histories also contain various amounts of information on Macetown, such as Miller (1966) and Hamel (2001). Because of the amount of information that is already available, only a brief general history of the area is presented here in order to set the archaeological remains in an historical context. More detailed specific information is presented below in the discussion of each individual site.

Macetown was established on a river terrace on the Arrow River upstream from Arrowtown after gold was found there in late 1862. It is commonly recounted that two independent parties—the Mace brothers working up the Arrow River and the Beale brothers working over from Skippers Hill—converged on the spot almost simultaneously. In January 1863 miners overflowing from the Shotover and the Arrow goldfields moved into the area, and a settlement soon established, with alluvial mining in the river and stream beds and banks as its economic base. The higher river terraces were also worked once races were constructed to bring water to the claims. Macetown (Figs 3 and 4) was initially named ‘the Twelve Mile’, this being the estimated distance of the location from Arrowtown (actually about 9 miles).

Figure 3. Macetown in the snow (late 1800s). On the left is Elliott’s Macetown Hotel, and on the right is the Alpine Hotel. Located on a river terrace deep in the mountains, Macetown could experience bitterly cold winters and very hot summers.

Photo: Lakes District Museum, Arrowtown.



By the 1870s the easily won alluvial gold was becoming worked out, and the miners' attention turned to the local quartz reefs. These had been known for some time, but it was not until 1875 that any real prospecting work was carried out. The Government offered a pound-for-pound subsidy to prospect the area, and cut tracks to improve access. The first company to register was the Homeward Bound, the mine being opened up in 1876 by Messrs Raven and Barclay, who also erected the first crushing battery in the area. There were high expectations of the reefs:

‘There is very little doubt of the permanency of the Macetown reefs. They are almost an absolute certainty, and when once opened out can be worked very cheaply, consequent on water power being almost everywhere available, and the steepness of the hills obviating the necessity for hoisting of ore or water, while the facility for self-acting tramways is all that could reasonably be desired.’ (A.J.H.R. 1878 H4: 19)¹

However, from the earliest days it was recognised that the lack of access to the area was a serious hindrance to mining, as there was no road up the Arrow Gorge from the outside world. All supplies had to be packed in, at a cost of £5 per ton, or £10 per ton for heavy timber delivered to the mines (A.J.H.R. 1878 H4: 19). This increased the cost of mining, and severely limited the machinery that could be used. Nevertheless, the mines were opened, and equipment brought in, all at great expense.

Despite repeated calls for the construction of a road, it was not until 1884 that one was completed from Arrowtown to Macetown, at a cost of £9,570 (A.J.H.R. 1885 C2: 3). There was an immediate drop in the cost of supplies, particularly the timber essential for shoring up mine tunnels. However, the improved access came too late to save many of the original companies and their mines, of which only the Premier and Tipperary mines were still working.

Figure 4. A similar view (late 1800s) of Macetown without the snow.
Photo: Lakes District Museum, Arrowtown.



¹. A.J.H.R. is an abbreviation for the New Zealand Parliament Appendices to the Journal of the House of Representatives.

The lack of access was not the sole reason for the failure of most of the Macetown mines. Work was interrupted by the harsh winters typical of the area which brought snow and frozen water supplies, and by occasional flooding in the steep gullies. These events increased costs, but mismanagement and misrepresentation of claims' worth to attract capital also took their toll. The 1876 Warden's Report commented that:

'A good deal of criticism has from time to time appeared in the public papers animadverting on the mismanagement, want of management, or excessive management, of the various companies...' (A.J.H.R. 1876 H11: 25).

Most of the mines were held by a succession of owners, and were opened and closed on several occasions. Numerous efforts, some successful, were made to attract overseas investment, and many of the mines eventually ended up in the hands of a few large companies. But by the early twentieth century most of the mines were played out. The erection of the massive Homeward Bound Battery in 1910 was something of a swan song, to be followed only by the brief resurgence of Government-sponsored mining during the 1930s Depression.

As mining was the single economic base of Macetown, the township did not long survive the closure of the mines. Many buildings that survived until the end of the Second World War were stripped in the post-war shortages of building materials. The first hanger for Southern Scenic Airways was built of Macetown iron in 1947 (Beaton 1971: 62). The Macetown Historic Reserve was surrendered from the Coronet Peak Pastoral Lease and gazetted as an historic reserve in 1980 (New Zealand Gazette, 1980, p. 912). Today, Macetown is a picturesque deserted ghost town that has become a popular tourist attraction (Fig. 5).

Figure 5. A general view of the site of Macetown at the confluence of the Rich Burn and the Arrow River: taken looking southeast from the ridge track to Advance Peak.
Photo: P. Petchey.



4. The archaeological survey

The archaeological survey involved three visits to the area, each of ten days duration. A base camp was established at the site of Macetown, and daily trips were made on foot to survey archaeological features. Existing walking tracks were used for access, while the map of the Macetown mines by D.J. Beck (available as a tourist map from the Arrowtown Museum) proved to be a useful general field guide.

The detailed survey was based on a series of low-level aerial photographs flown by Kevin Jones (Department of Conservation) on 24 May 1999. Older commercial high-altitude aerial photographs of the area were used to fill in a few gaps in the coverage of Jones' photographs. Archaeological features were mapped in the field by drawing on permatrace overlays over the aerial photographs. Problems of scale, distance and distortion were dealt with in a number of ways.

In the area of the main Macetown township, a survey was carried out using a Wild optical theodolite, traversing down the Rich Burn from Anderson's Battery to the Cemetery Reserve, and then down the township flats to the timber building at the southern end of the town. This traverse was tied into a series of identifiable points on the aerial photographs. The aerial overlays were then scaled (using a scanner) and adjusted (by hand and eye) to fit onto the accurate base plan, to a scale of 1:5000. This was then checked against an enlargement of the NZMS 260 topographical map of the area (F41 Arrowtown), which generally agreed well, and the NZ map grid was added from this source. At this time also, a ground photographic record of the main features of the town was made. (Photographs are held at Science & Research, Department of Conservation, Wellington.)

The sites up the Rich Burn and downstream from Macetown were plotted onto base maps generated by enlarging the NZMS 260 F41 topographical map to 1:5000, with detail of topographic features (such as river and stream beds) checked against an enlargement of a high-altitude aerial photograph (Survey No. 8436, E/4, December 1984), taking care to use only the central part of the image. The archaeological features as plotted on Jones' low-level aerial photographs were again scaled and adjusted to fit onto these base maps. Some ground checks were carried out by using a hip-chain to measure distances over several hundred metres in the field, and checking these measured distances against the calculated distance on the scaled plans. While this method was not as accurate as that used for the survey of the township area (based initially on the theodolite traverse), a check of the method in the township suggested that the results are tolerably accurate. The main source of error is in the extreme enlargement of the 1:50 000 NZMS 260 topographical map (1000%), which forms the ultimate base for the whole survey and the source of the map grid as shown on the finished archaeological maps. These maps have been reduced in scale for publication.

Throughout the survey, GPS locations of some features were taken using a Garmin 12 hand-held GPS receiver. However, as the random error was removed from the GPS system in May 2000, part of the way through the survey, only those points recorded after that date were considered. These generally agreed well with the results of the above methods, but were not used as a survey base.

5. Macetown township (Map 1)

The township of Macetown grew up on a large terrace near the confluence of the Rich Burn (then known as the Twelve Mile Creek) and the Arrow River. The settlement site is, today, the focus of the Macetown Historic Reserve. Map 1 (pp. 10-11) shows the township and the archaeological features mapped during this survey.

5.1 MACETOWN HISTORY

Gold was first discovered in the Arrow River in 1862, probably by Jack Tewa ('Maori Jack'), although it was the movements of William Fox in late 1862 that caused the rush to the river and, ultimately, led to the establishment of Fox's (now Arrowtown) at the mouth of the gorge. The river and its tributaries were quickly prospected, and it is often said that either the Mace brothers or the Beale brothers were the first at the site of what was to become Macetown, although this is impossible to now verify (Veitch 1972).

The population of the settlement initially consisted of miners moving up the Arrow River or over the hills from the Shotover (Veitch 1972). The peak population of the new settlement was estimated at about 300 in January 1863 (Powell 1976: 15), although estimates of up to 500 have also been made (Veitch 1972). With this large influx of miners, a canvas town quickly formed (Miller 1966: 164; Veitch 1972).

Commercial operations were soon established at the Twelve Mile. The Mace brothers erected a large store in September 1863, which apparently joined a number of other similar establishments (Veitch 1972). The name change to 'Macetown' probably occurred gradually, its first public use being in February 1865, although the post office which opened in March 1865 was still called 'Twelve Mile Creek' (Veitch 1972). The West Coast gold rush of 1865 led to an outflow of people, including the Mace Brothers, and a subsequent decline in the population, but enough people remained to keep the town alive.

The Macetown School was opened in 1870 with a roll of 12 boys and 9 girls (Miller 1966: 171), but the population was in decline in the early 1870s, and in 1876 the government withdrew the subsidy for the teacher's salary, although it was later reinstated. The development of the Macetown reefs in the late 1870s saw a gradual rise in the population again, and a peak was reached in 1896 when 206 people were recorded in census figures, including 10 men and 4 women in Sawyer's Gully and 15 men and 6 women in Scanlan's Gully (Veitch 1972).

There were also Chinese miners at Macetown, and there may have been a Chinese market gardener (Ng 1993: 339). An area of Chinese huts was located on the flat just east of Smith's Store and bakehouse, where a photograph was taken of G.H. McNeur standing outside a hut with three Chinese men (Fig. 6).

Figure 6. Chinese miners and G.H. McNeur at Macetown.
Photo: McNeur collection, Alexander Turnbull Library, F19150½.

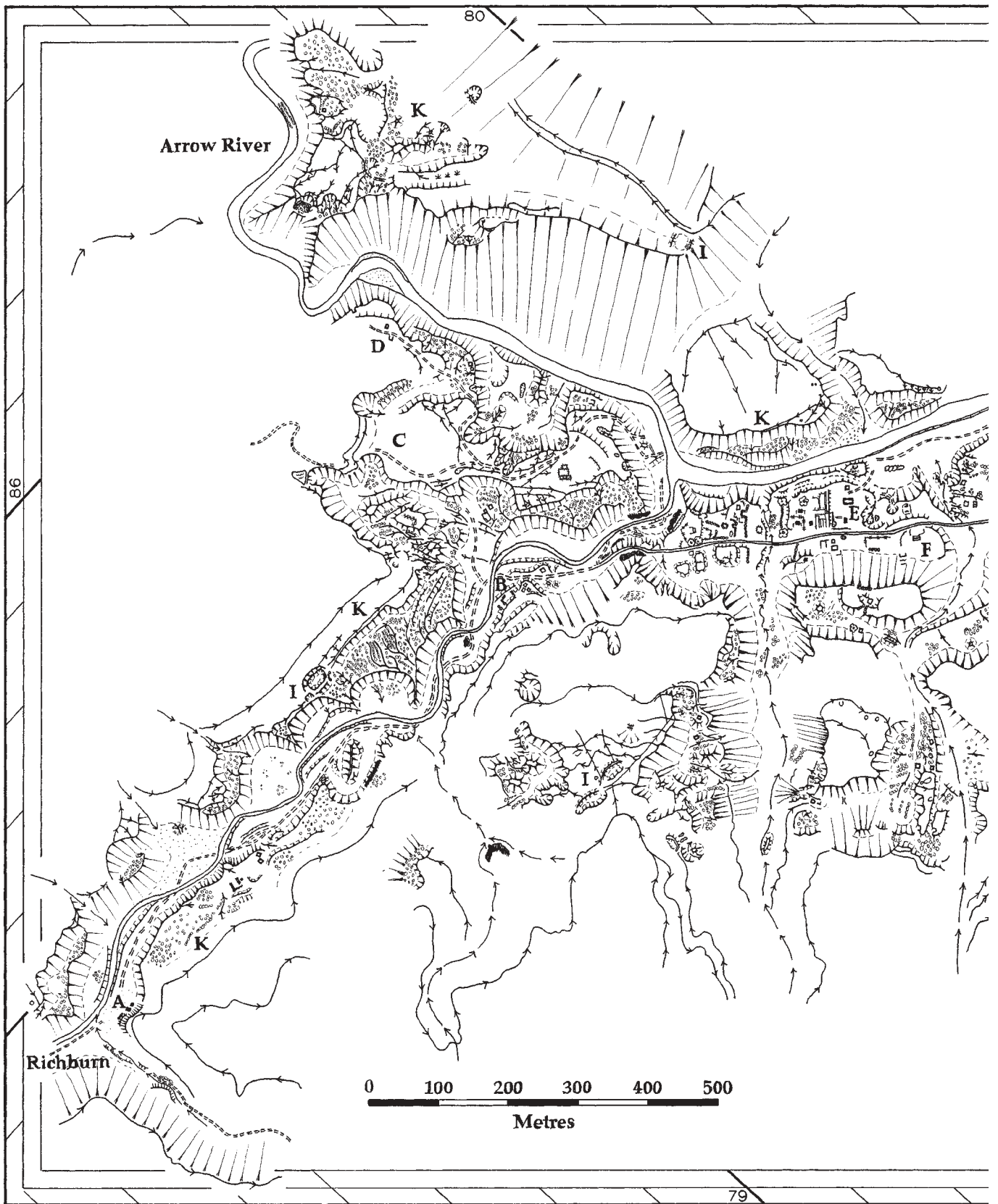


Chinese miners were engaged in both alluvial mining (see the account of the Tipperary Mine below), and quartz mining. The merchant Choie Sew Hoy had an interest in a quartz claim in Sawyer's Gully adjacent to the Premier mine (Ng 1993: 315).

A problem for both the settlement and the mines was the lack of good road access to the outside world. The options available were either the Big Hill track or the Gorge track, and all goods and equipment had to be laboriously packed in. There was repeated agitation over many years by residents and miners for the Government and the Lake County Council to construct a road, but by the time one was completed in 1884 many of the mines had already closed down.

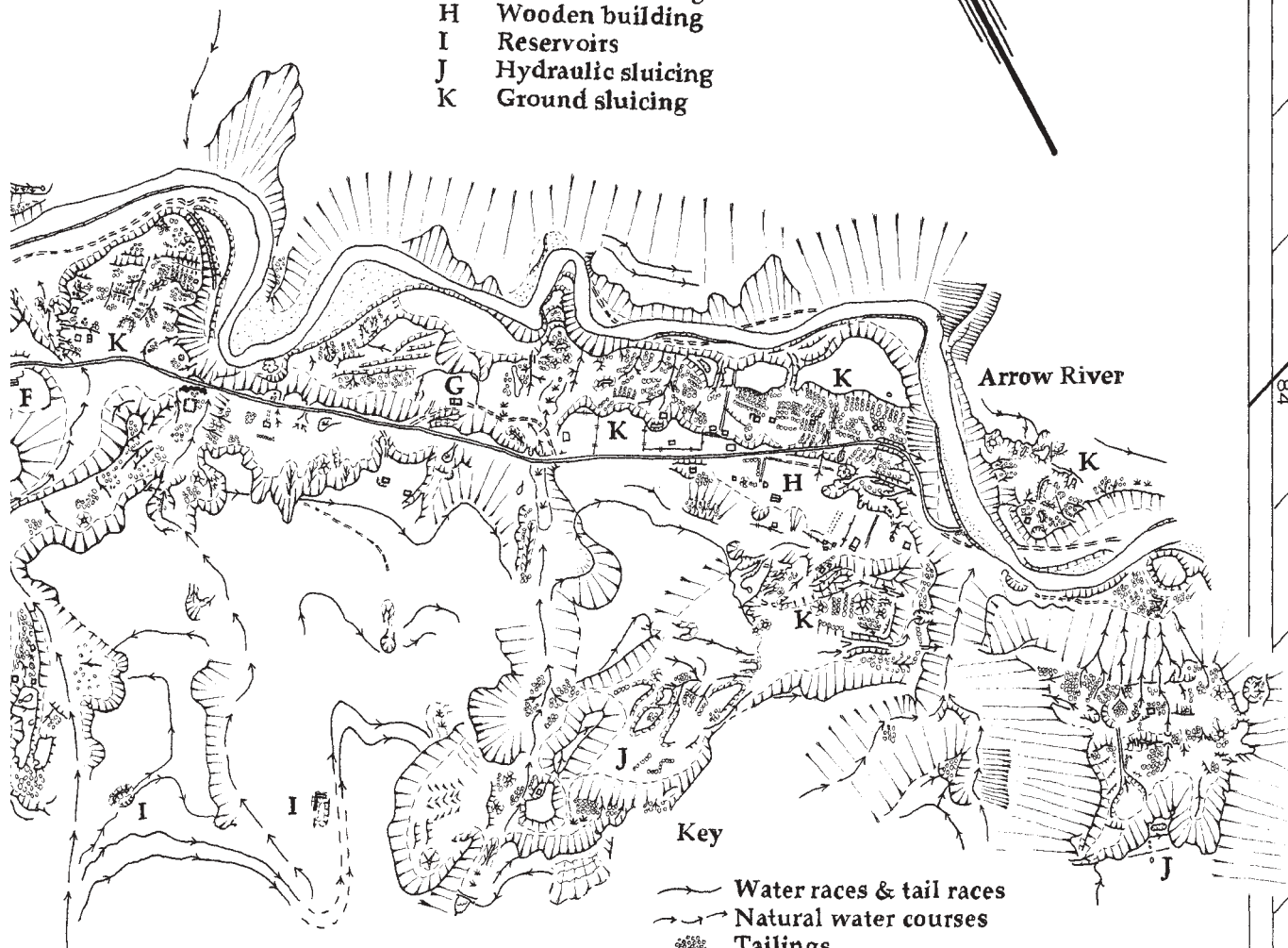
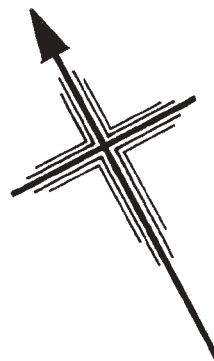
The final decline of Macetown began with the closure of the Premier Mine in 1905. This was the last large-scale quartz mine that provided employment in the community, and the remaining small quartz mines and alluvial claims could not provide reliable work (Veitch 1972). Various schemes would have provided periods of optimism, such as the large-scale work carried out at the Homeward Bound Mine in 1909–10, but a slow decline was inevitable in the face of mine failures. The school closed in 1916 because of the reduced roll, and the Post Office and the telephone office closed within days of each other in 1916, although the latter was reopened from 1917 to 1921. After this, the town was abandoned except for William Jenkins ('Billy Jenks'), whose mother had run the Alpine Hotel.

During the 1930s Depression, a number of people moved back to Macetown, mining on Government subsidies. There were still a number of habitable buildings standing, together with plenty of firewood from the trees that had grown up in the area, and the road was again being maintained by the Lake County Council. As the Depression eased, miners and their families left, and the last resident was again William Jenkins.



Note that the two parts of Map 1 overlap at the centre.

- A Anderson's Battery
- B Twelve Apostle's huts
- C Cemetery Flat
- D Granny Barker's house
- E Stables ruin
- F Bakehouse
- G Needham's cottage
- H Wooden building
- I Reservoirs
- J Hydraulic sluicing
- K Ground sluicing



Arrow River

Key

- Water races & tail races
- Natural water courses
- Tailings
- Stacked stone/revetment
- Hut sites/structures
- Old fencelines
- Roads/tracks
- Slope

Map 1
Macetown

5.2 ARCHAEOLOGICAL EVIDENCE OF MACETOWN

The township straggled nearly a mile along the one main road, being constrained by its site on the long narrow river terrace (Map 1, pp. 10-11). It appears to have had two main sections: the northwestern end with the main community buildings such as the hotels, school, bakehouse and stores; and the southeastern end, which includes Joseph Needham's house but is otherwise not well documented. The whole area was surveyed in 1878, but the survey plan shows structures only at the northwestern end (Fig. 9).

The site of Macetown is archaeologically very rich. As the area is actively managed and receives large numbers of visitors in four-wheel-drive vehicles, it is generally quite 'tidy', without much small artefactual material scattered about. Most building sites are marked by terraces, levelled areas, chimney remains and cultural plantings. There are still three standing buildings, namely the timber building at the southeastern end of the town area (Fig. 7), Needham's cottage (Fig. 8), and Smith's bakehouse, the last two of which have



Figure 7. The last remaining timber building at Macetown. Note the clumps of flowering daffodils.
Photo: P. Petchey.

been restored. Substantial ruins of a small stone building near the timber building and the Alpine Hotel stables near the bakehouse also stand. It is very likely that the township area has been heavily fossicked for bottles.

Of particular interest around the town site are the remains of cultural plantings. The large deciduous trees make a spectacular sight in autumn, while many daffodils can be seen in spring, still largely confined to their original flower beds. One interesting spring sight is two extended rows of daffodils defining a long-disappeared front path to a house site at the base of the hillside on the south side of the township. Throughout the town site there are still a number of fruit trees, but many others have died, and none seem to be naturally reproducing. A number of old hawthorn hedges are easily identified, the hawthorn still growing in the original hedge lines. In general, it appears that

plants that are not palatable to stock survive and may multiply, while palatable plants will not be naturally replaced, as any seedlings that appear are eaten.



Figure 8. Joseph Needham's cottage. This building was restored by the former Department of Lands and Survey.
Photo: P. Petchey.

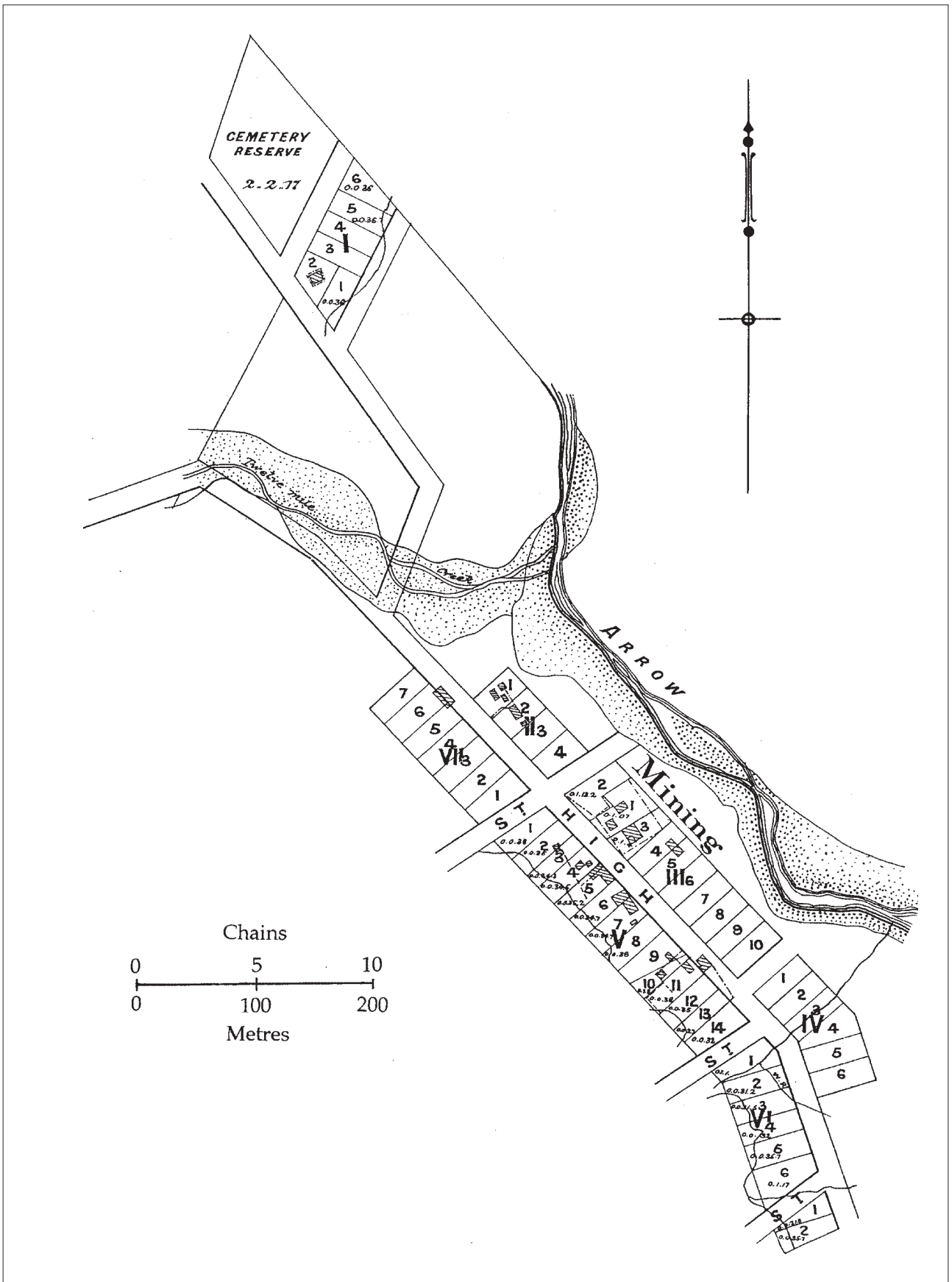


Figure 9. Part of the 1878 plan of Macetown, showing the northern end of the surveyed township with a number of building locations marked. The surveyed township down to the river approximates the area of the Historic Reserve. Map: Hocken Library, Uare Taoka o Hakana, University of Otago, Dunedin.

5.3 SOME SPECIFIC MACETOWN SITES

Over the years there were a large number of buildings erected at Macetown, including numerous residences, several hotels, stores, a bakehouse, a school, a post office and a hall. The archaeological remains of a number of these can be positively identified on the ground. Some of these sites are described below, starting from the southeastern end of the township, where the road climbs up from the river bed to the location of the first modern interpretation sign.

On the left (southwest of the road) is the only remaining timber building in the township (Fig. 7, and 'H' on Map 1, pp. 10-11). Its history is unknown. Beside this building, past some old gnarled willows, are several house and hut sites, the largest of which has the daffodil pathway mentioned above. There are several other hut sites, the remains of an orchard, and a stone wall fronting the road. On the other side of the road (northeast) from the wooden building is a large area of ground sluicing. Fifty metres past the stone wall just mentioned there is a small square stone structure set immediately above and southwest of the road. It is in good condition, although the roof is missing.

Two hundred and fifty metres further on, on a terrace below and to the northeast of the road, is Needham's cottage (Fig. 8, and 'G' on Map 1). Joseph Needham was the schoolmaster at Macetown from 1879 until 1889, after which he stayed in Macetown goldmining (Beaton 1971: 54). The cottage was substantially rebuilt by the Department of Lands and Survey c. 1979.

A further two hundred metres on, the road drops down a steep cutting from the top of a bluff. To the northeast is an area of ground sluicing tailings with shallow dams. There are several hut sites on this terrace, known to have been inhabited by Chinese miners (see Fig. 6). An interpretation panel shows one hut when it was inhabited, together with its occupants and G.H. McNeur.

The road then climbs again to the site of the Macetown memorial and a series of interpretation panels. These stand on the site of Smith's store. Just behind them (to the southwest) is the site of Smith's bakehouse ('F' on Map 1). This was also rebuilt by the Department of Lands and Survey. Figure 10 shows this area in 1897, with the store standing prominently beside the road at the top of the rise.

Just beyond the store site was the Macetown Hotel (see Figs 3 and 4). This was initially owned by Joseph la Franchi, then sold in 1873 to the Italian Resta brothers, and later passed through the hands of Edmund Elliott, George Spooner, a Mrs Elliott and Robert Gilmore. It was finally bought in 1905 by John McLeay before being destroyed by fire in 1906.

Almost directly opposite the Macetown Hotel (on the northeast side of the road) was the Alpine Hotel (Fig. 10). Its site can be identified by the substantial ruins of the stables which stood behind the hotel ('E' on Map 1). It was opened in 1883 by a Mr Dyson, was later operated, for a short time, by William Jenkins, and then by Mary Illingworth. By 1905 James Anderson had the licence, and the Alpine was the only operating hotel left in Macetown. It was then run for a time as an accommodation house, before finally closing in 1918 (Veitch 1972).

Past the Alpine Hotel (still on the northeastern side of the road) were the Public Hall, the school, the Post Office and the school residence. The school was opened on 7 February 1870. The building, constructed the previous year, measured 22 ft by 14 ft. In 1895 a new school building was erected, the old

Figure 10. Macetown in 1897. The store and bakehouse are on the left of the road at the top of the rise. The long white building on the opposite side of the road (to the left of the store in the photograph) is the Alpine Hotel. To the rear of this are the stone stables, the ruins of which can still be found.
Photo: Hocken Library, Uare Taoka o Hakena, University of Otago, Dunedin.



building being retained as a playhouse. The school finally closed in 1916. The Public Hall was opened in March 1899, with a large ball held to celebrate the opening (Veitch 1972).

A number of other house, hut, and business sites and access lanes are scattered on either side of the road as one continues along. Revetted banks and remains of gardens mark several of these just past the small stream (Fig. 11). The road then drops down a cutting towards the Rich Burn, where the track branches.

From this junction, the northeastern track crosses the Rich Burn, and another stream to lead round to a track cut up onto Cemetery Terrace ('C' on Map 1). This was the location of the Catholic Church and the Cemetery Reserve. The Catholic Church was established during the first year of the settlement. However, by 1865 the building had fallen into disrepair. The 1878 plan of Macetown (Fig. 9) still shows a building on this spot, although it is not certain how long it survived. The graveyard was located near the Church, and two graves are reputed to be still occupied, although most of the bodies have been removed to the Arrowtown Cemetery. The ridge track to Advance Peak climbs up the hillside close to the church and cemetery site. The edges of the terrace have been extensively worked by ground sluicing.

The track continues to the north, to the site of Granny Barker's house, on a terrace above the Arrow River ('D' on Map 1). The house site is marked by the remains of a stone chimney and numerous trees. A line of dead fruit trees is present below the existing vegetation.

Returning to the main road at the end of the township, if one carries on along the road to the west, rather than turning northeast to go to Cemetery Flat, it continues onto a ford in the stream. To the southwest, above the ford, were the huts of the 'Twelve Apostles' ('B' on Map 1). These were twelve old miners who were renowned for their drinking binges. More information about them is available in Beaton (1971: 48-49).

Over the ford, the road continues up the Rich Burn, which is discussed in more detail in Chapter 7.



Figure 11. Part of the western end of Macetown in autumn. Numerous low stone walls and lines of revetment mark out long-disappeared gardens and house sites amongst the trees.
Photo: P. Petchey.

6. Macetown terraces and alluvial mining (Maps 1 and 2)

6.1 HISTORY OF MINING AT MACETOWN

The first gold workings in the Arrow River were in the river bed and on the beaches. Some of this work paid well, and in the winter of 1863 some 1500 miners in the Arrow forwarded a monthly average of 6000 oz of gold (Veitch 1972). Miners soon turned their attention to the higher terraces on the western side of the valley. Work began in 1865, but lack of water for ground sluicing was a problem. To a certain extent this was overcome by tunnelling to extract the gold-bearing gravels for subsequent washing (A.J.H.R. 1865 C4A: 16), but many areas were not mined until long (and expensive) races were constructed to bring water to the claims from the creeks further upstream. Later, hydraulic sluicing increased the amount of material that could be worked. In places, clear archaeological evidence of this method cutting through evidence of earlier ground sluicing can be seen (see below).

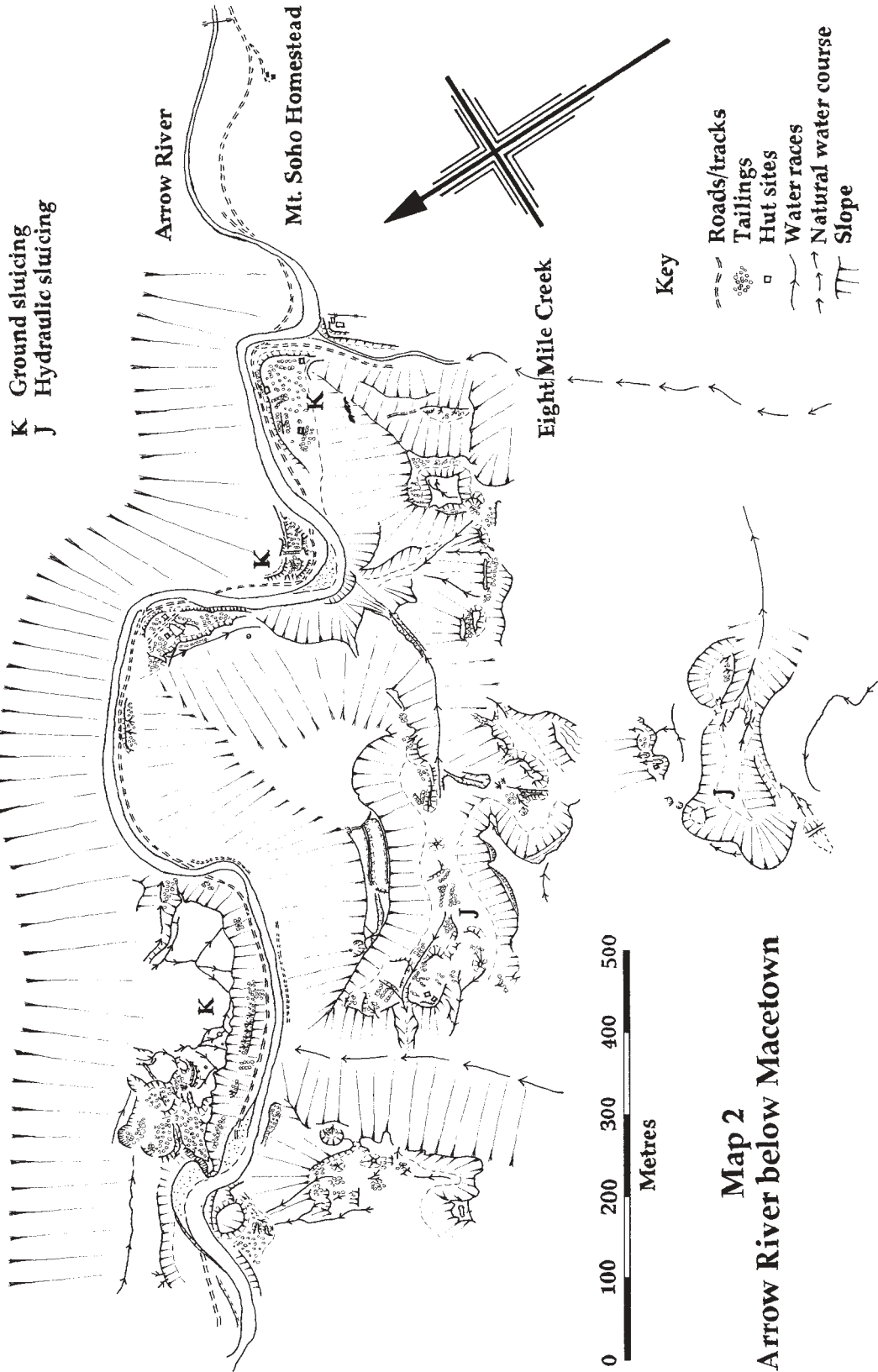
When quartz (hard-rock) mining became the dominant activity at Macetown, sluicing activities declined but did not cease completely (Veitch 1972). Large areas of the terraces on the west side of the river which could not be worked in the early years due to the difficulty and expense of bringing in water (Veitch 1972) were later extensively worked, particularly after the closure of the Premier hard-rock mine in 1906 spurred a renewal of interest in alluvial mining (Veitch 1972). One of the most extensive operations was that of the Macetown Sluicing Company, which worked the terraces behind the township (Veitch 1972).

6.2 ARCHAEOLOGICAL EVIDENCE

Extensive evidence of alluvial mining can be found on the hillside above Macetown on the western side of the valley (see Fig. 5, centre-right of photograph), as well as on the terraces on both sides of the river at the confluence of the Arrow and the Rich Burn. This archaeological survey has mapped the workings from the confluence of the Arrow River and the Eight-Mile Creek (Fig. 2; Map 2, p. 18) to the confluence of Scanlan's Gully and the Rich Burn (Fig. 2; Map 1, pp. 10-11).

To a remarkable degree, the location of the present archaeological sites was foretold in an 1865 sketch of the 'ancient river bed' between the Eight Mile Creek and the Twelve Mile Creek (Rich Burn) (Fig. 12) published in the District Mining Surveyor's report (A.J.H.R. 1865 C4A; following p. 14). This report stated:

'At the Twelve-mile Creek, and between it and the Eight-mile, Arrow, a lead of gold has been struck on the terraces on the west of the river, upon which several extended areas have been surveyed. This lead has all the appearance of having been at one time the bed of the Arrow, although now several hundred feet above the present level of the river. The run is not continuous, but is broken by the intersection of numerous small gullies that have



K Ground sluicing
 J Hydraulic sluicing

Arrow River

Mt. Soho Homestead

Eight Mile Creek

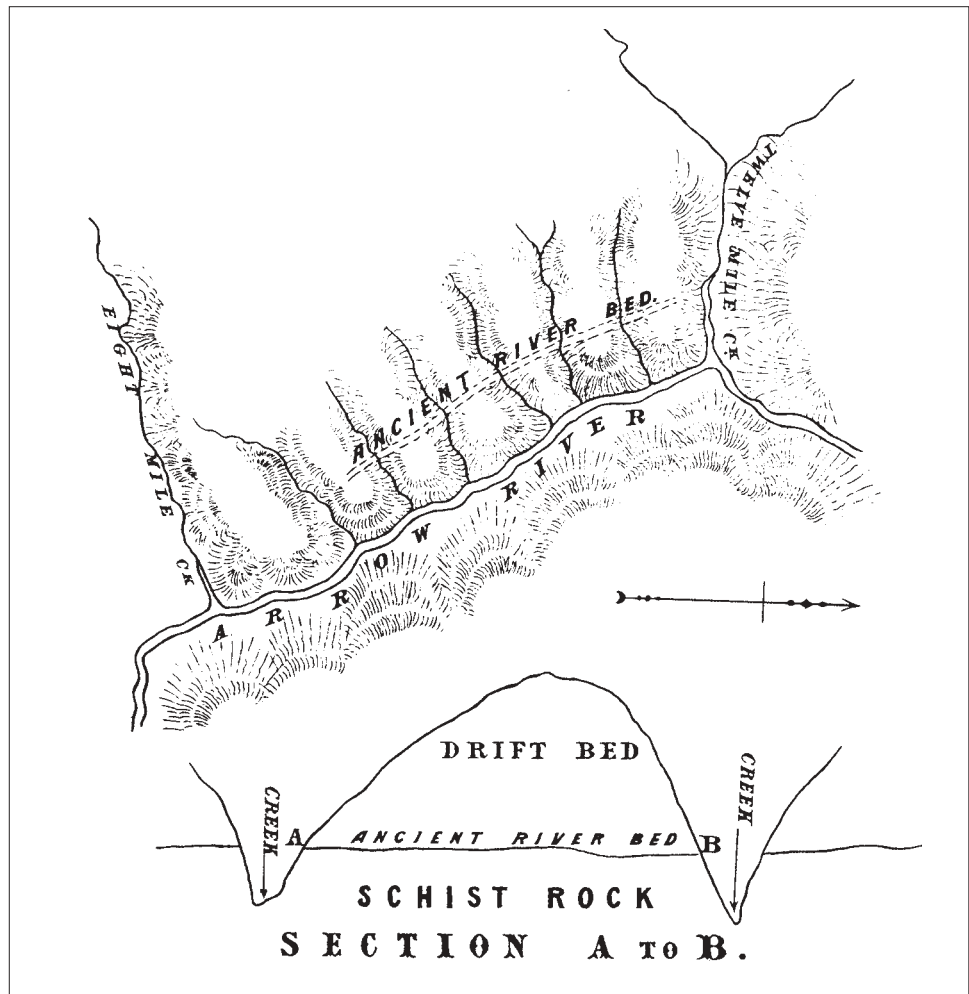
Key

- Roads/tracks
- Tailings
- Hut sites
- Water races
- Natural water course
- Slope

0 100 200 300 400 500
 Metres

Map 2
 Arrow River below Macetown

Figure 12. 1865 plan of
 'ancient river bed'.
 A.J.H.R. 1865 C4A.



apparently cut their ways across it. The accompanying sketch [Fig. 12] shows approximately the lay of the ground, by which it will be seen that the bed of the tributary creeks which cross it are worn away deeper than the ancient river bed which constitutes the lead.' [A.J.H.R. 1865 C4A: 16].

The workings are concentrated in a band running parallel to the Arrow River, extending some 600 m up the hillside. Typically, there are the remains of a number of high water races running around the hillsides, which brought water to the claims. Below the races are the upper sluice faces of the claims, below which run the tail races and piles of tailings.

The alluvial mining landscape around Macetown is dominated by the effects of two basic mining technologies: ground sluicing (using water run over a scarp to wash the gold-bearing gravels away); and hydraulic sluicing (using a jet of water under pressure to wash away the gold-bearing gravels). Ground sluicing sites typically have water races at low levels and numerous stacks of tailings below shallow sluice faces, while hydraulic sluicing sites have high-level water races and high sluice faces. Both systems often used reservoirs for water storage.

There is some pattern to site location, with ground sluicing areas dominating the low- to mid-altitude sites, and hydraulic sluicing sites often found higher up the hillsides. In several places at Macetown there is clear evidence of the progression of mining, with hydraulic sluicing cutting through earlier ground sluicing sites lower down the hillsides (Fig. 14).

Although some very large gullies have been sluiced out of the hillsides, many of them are not visible from the road. In some places large tailings fans spreading out from narrow gullies indicate a large set of workings higher up the hillside. Figure 13 shows one of these sluicing scars, cut from a high terrace.

The alluvial workings that are visible from the road are typically low-level ground sluicings on the insides of bends in the river. These are generally no more than 10 m above the river level, and are fed by short water races running out of side gullies and creeks. Shallow sluice faces sit above heaps of tailings with numerous tail races running out to the river. Hut sites are often found within the tailings, although in some cases very small structures may have been tool sheds rather than habitations. Figure 14 shows a large area of such tailings inside the town area.



Figure 13. A 'hidden valley' hydraulic sluicing scar. Not visible from the road (to the left and below), this valley was sluiced from the hillside. The cut is between 110 and 200 m wide (see Map 2, p. 18, the northernmost of the two areas marked 'J'). *Photo: P. Petchey.*



Figure 14. An oblique aerial view (looking southwest) of the southern end of Macetown. High on the hillside is a hydraulic sluicing scar (J on Map 1, pp. 10-11), with the tailrace leading off to the left cut through earlier ground sluicing tailings (K on Map 1). The 'tracks' that appear to follow hillside contours are the remains of supply and head races. Below, several building sites and Macetown's surviving timber building (H on Map 1) are located in the trees, with the regular patterns of hand-stacked ground sluicing tailings on the flat in the foreground (K on Map 1).
Photo: K. Jones, Department of Conservation, Wellington.

7. Rich Burn sites (Maps 1, 3 and 4)

The valley of the Rich Burn (or Twelve Mile Creek or Gold Burn) contained a number of mining sites in its own right, and also provided a link between the numerous mines in the adjoining gullies and hills. The main track between Macetown and the mines, ultimately leading to Advance Peak, ran along the valley. In addition, six stamping batteries: the Public, Anderson's, Homeward Bound (which consisted of three different batteries serving the same mine at different times) and the Sunrise, were all located by the Rich Burn, close to this track. These served the hard-rock mines in the surrounding hills. Thus both alluvial and quartz reef (hard-rock) gold was mined in this area.

The alluvial mining sites in the Rich Burn are typical of the area, where ground sluicing technology was used to work small areas of ground above the valley floor. The archaeological remains of this activity include piles of tailings, tail races and scattered hut sites.

The main archaeological sites in the Rich Burn are discussed below, heading upstream (west) from the confluence with the Arrow River.

7.1 THE 'TWELVE APOSTLES'

The site of the huts of the 'Twelve Apostles' is discussed above in Chapter 5 (Macetown). The huts were located on the true right bank of the Rich Burn, beside the first ford of the main track up the stream ('B' on Map 1, pp. 10-11).

7.2 ALLUVIAL MINING

Along the valley sides of the Rich Burn are sluice faces and heaps of tailings from ground sluicing operations. On the true left bank are the sluice faces cut back into the Cemetery Flat terrace ('C' on Map 1), while on the true right bank are scattered areas of overgrown tailings.

7.3 PUBLIC BATTERY

The Public Battery was constructed by the Macetown Crushing Company in order to fulfil a need for a general battery. The company consisted mainly of local shareholders, and the battery was erected in 1877 on a terrace about a quarter of a mile upstream from the township (Veitch 1972). It consisted of ten 6-cwt stampers powered by a Greenlaw's turbine (A.J.H.R. 1879 H11: 23). However, there were complaints that it was located too far from the mines, and there were calls to relocate it near the Lady Fayre ground (Veitch 1972). Nothing came of this, and in December 1882 tenders were called for the removal of the plant (Veitch 1972).

Nothing remains on the site to identify it today. It was probably located on the true left of the stream, between 100 and 200 m upstream from the first main ford on the track.

7.4 CONCRETE FOUNDATIONS

Located on a terrace above the true right bank of the stream are several concrete foundations. One appears to be an engine bed, while the others are of uncertain use. It appears that they were housed in a small building, and may have been built during the last main period of activity at Macetown in the 1930s Depression.

7.5 ANDERSON'S BATTERY

Anderson's Battery is located beside the Rich Burn, at the mouth of Scanlan's Gully ('A' on Map 1, pp. 10-11; and Map 3, p. 24). As it served a mine in Scanlan's Gully, it is discussed in Section 8.4 below.

The vehicle track up the Rich Burn finishes at the battery, where there is plenty of space for parking. The old road (now only passable on foot) continues up the Rich Burn. A vehicle barrier is located about 100 m further on to prevent the use of four-wheel-drives and motorcycles.

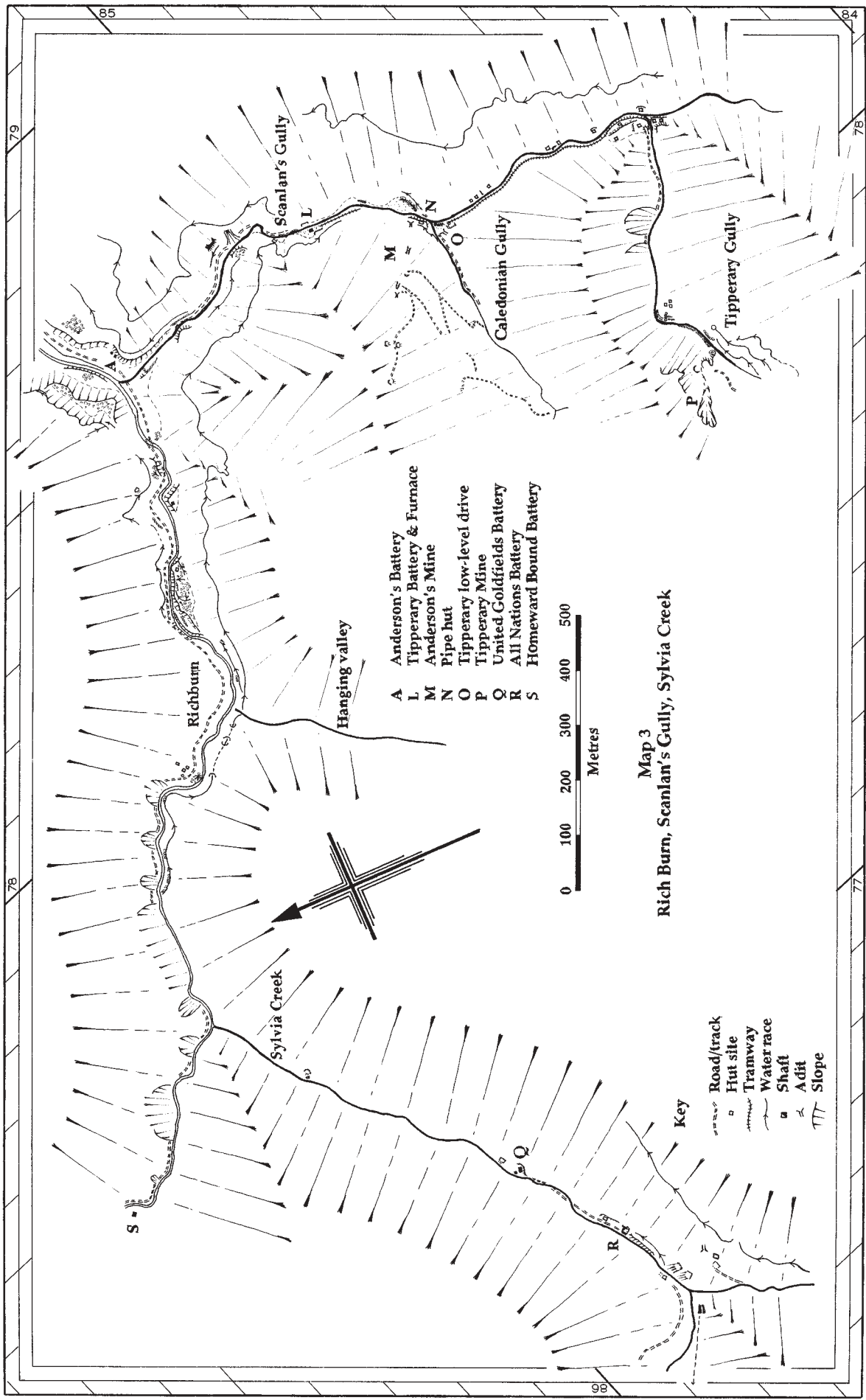
7.6 ALLUVIAL WORKINGS AND HUT SITE

Shortly beyond the first ford after the vehicle barrier, two areas of alluvial workings are located on the true right bank, across the creek from the track. These are located on terraces well above the level of both the stream and the track. The first area is only about 20 m by 20 m, and sits atop a bluff projecting out into the valley. It contains a small hut site.

The second area is much larger, 100 m long by 25 m wide. It also contains a hut site, although most of the area is taken up by piles of tailings and several tail races. Both areas are shown on Map 3.

7.7 HUT SITES

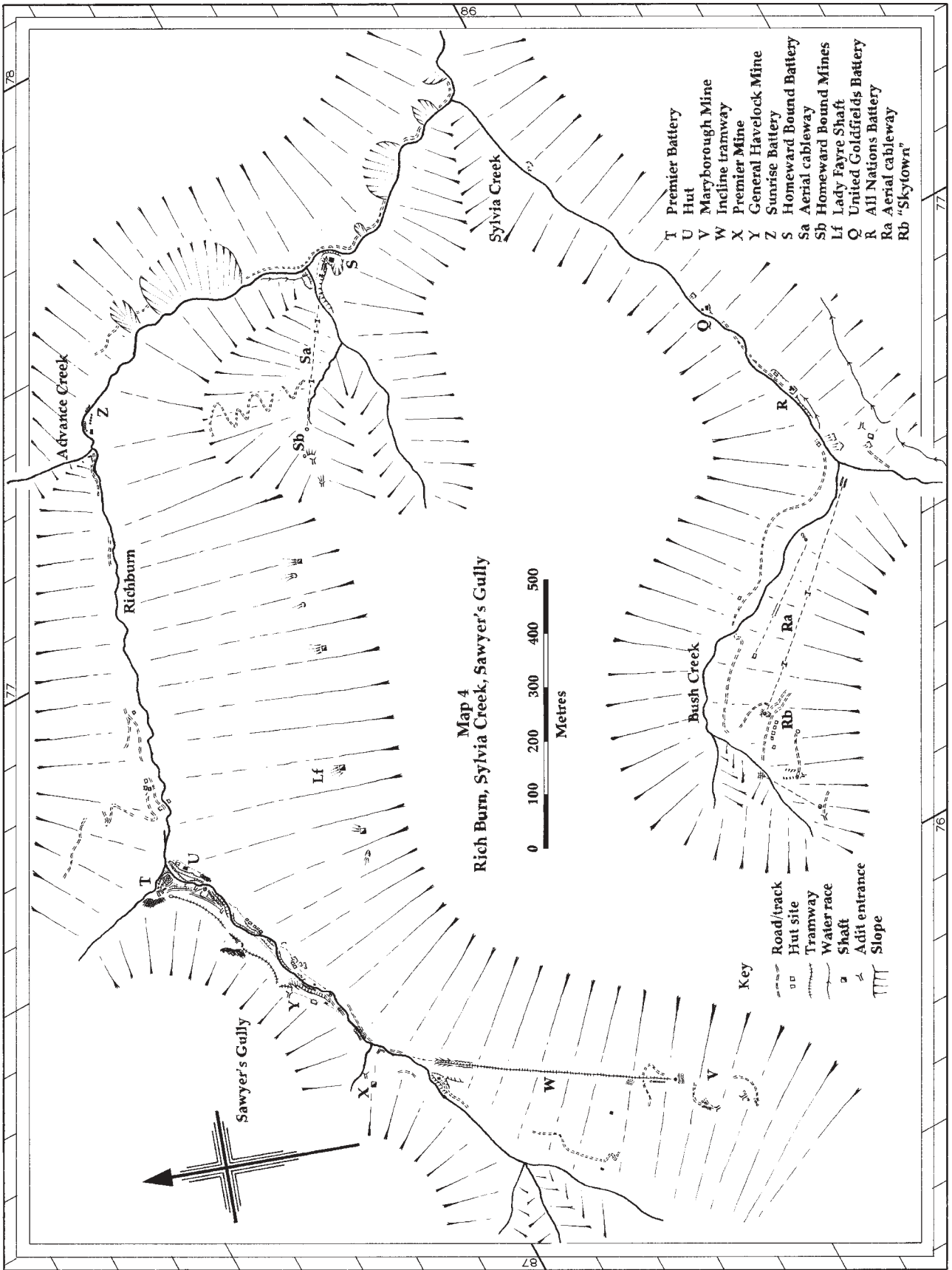
About 150 m past the hanging valley (Map 3), three hut sites are located on a level area above the track. One hut site is marked by a stone chimney, which has half fallen away. The huts are not visible from the track.



- A Anderson's Battery
- L Tipperary Battery & Furnace
- M Anderson's Mine
- N Pipe hut
- O Tipperary low-level drive
- P Tipperary Mine
- Q United Goldfields Battery
- R All Nations Battery
- S Homeward Bound Battery

Map 3
 Rich Burn, Scanlan's Gully, Sylvia Creek

- Key
- Road/track
 - Hut site
 - Tramway
 - Water race
 - Shaft
 - Adit
 - Slope



7.8 SYLVIA CREEK

At the confluence of the Rich Burn and Sylvia Creek the track branches. The sites located up Sylvia Creek (including the United Goldfields and All Nations batteries) are described later in the report. The main Rich Burn track continues up the valley to the Homeward Bound Battery.

7.9 HOMEWARD BOUND MINE AND BATTERY

The Homeward Bound Company was the first quartz-reef mining company to register at Macetown, with a claim on the Premier lode (although the Tipperary reef, see below, was found first). While opening up the mine in 1876, Messrs Raven and Barclay won 551 oz. of gold from 542 tons of stone (Beaton 1971: 14). They erected the first battery in the Macetown area—the ‘Little Wonder’—in March 1876 (A.J.H.R. 1900 C: 27; Powell 1976: 27). This was a small mill of four stamps, erected to test the value of the reef. Its first crushing produced 10 oz 16 dwts of gold from 2 tons of quartz (A.J.H.R. 1876 H3: 3). The floods of 1878 swept away the mine office and stables and silted up the battery (Veitch 1972). This led to its replacement by a more powerful five-stamp battery located comfortably above the stream flood level. A self-acting tramway was also constructed to take ore to the mill from the mine, a distance of 22 chains (A.J.H.R. 1879 H11: 25). The following year, a further ten stamp heads were added to the battery (A.J.H.R. 1880 H26: 26). Figure 15 shows the second Homeward Bound Battery.

The mine was operated on three levels. The top two levels were payable, but the third (lowest) level was not. Disaster struck in November 1883 when a slip caused by heavy rain completely destroyed the tramway to the battery (Veitch 1972). The company was wound up in 1884, the mine passing into the hands of Messrs Gage and Co. of Dunedin. They carried out some prospecting, but found nothing worthwhile (Powell 1976: 29).

The mine was later acquired by Farrell’s New Zealand Consolidated Gold-mines (Limited), and in 1909 it was announced that payable quartz had again been located, and work began on the construction of a new aerial cableway from the mines down to the Twelve Mile Creek (Rich Burn). The following year the large OPQ (Otago Pioneer Quartz) stamping battery at Waipori was dismantled and transported to the site where it (the third Homeward Bound Battery) still stands (A.J.H.R. 1910 C3: 33). Between 1908 and 1911 stone from the Homeward Bound, All Nations and Garibaldi mines was crushed either in this battery or in a small composite battery in Bush Creek (possibly the United Goldfields Battery) (Veitch 1972). The outbreak of war in 1914 brought a complete cessation of funds from London, and all work was stopped in the claims (Veitch 1972). Figure 16 shows the third Homeward Bound Battery (date unknown) and Fig. 17 shows it in a state of disrepair in about 1930.

Some prospecting work was carried out in 1935, with one of the old levels being reopened (A.J.H.R. 1935 C2: 41), but this appears to have been the last activity at the mine.

Figure 15. The second Homeward Bound Battery. The tramway can be seen leading from the mine on the hill above. Water from a race powered the mill and the waste water flowed via a waterfall into the Rich Burn.

Photo: Museum of New Zealand Te Papa Tongarewa (c.014899)



7.9.1 Archaeological description

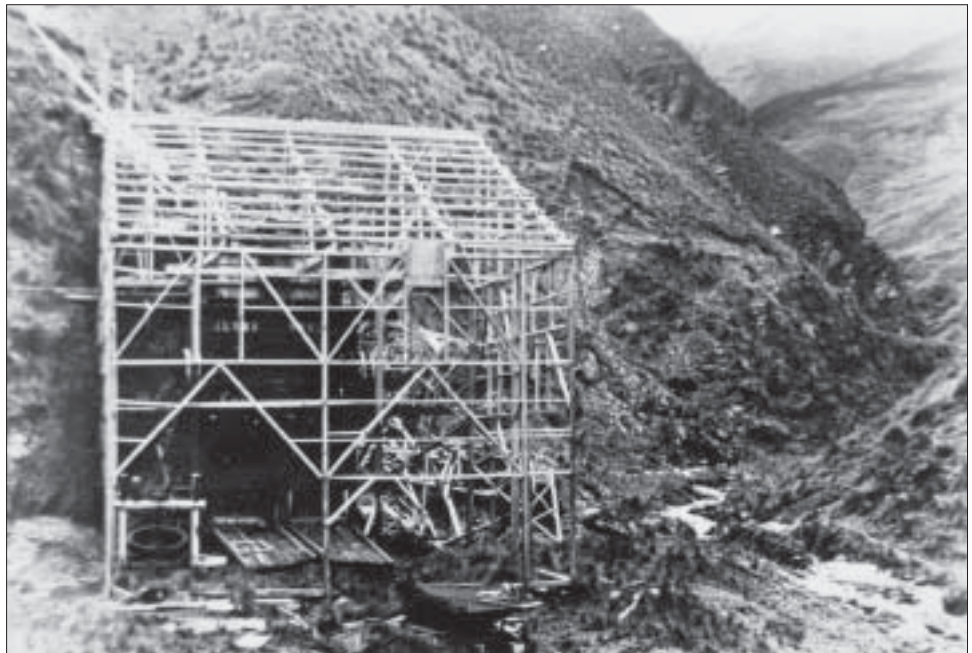
The archaeological evidence of the Homeward Bound mines consists of three battery sites, the aerial cableway, the mines and a track climbing the hillside above the second battery site (see Map 4, p. 24 and Fig. 18). When walking up the Rich Burn, the first feature to come into view is the large battery (Fig. 19, p. 30 and 'S' on Maps 3 and 4, pp. 24-25).

This is the third Homeward Bound Battery, moved to the site from Waipori in 1910. It is a ten-stamp mill, manufactured by the Sandycroft Foundry of Chester, England. The heavy frame timbers still bear the marks cut into them to aid reassembly. Extensive stabilisation and timber preservation work has recently been carried out on the structure, including the construction of a roof. Scattered around are various items of battery plant, including a berdan and a

Figure 16. Third Homeward Bound Battery, date unknown.
Photo: Lakes District Museum, Arrowsmith.



Figure 17. Third Homeward Bound Battery, in a state of disrepair, c. 1930.
Photo: Alexander Turnbull Library, F29659½.

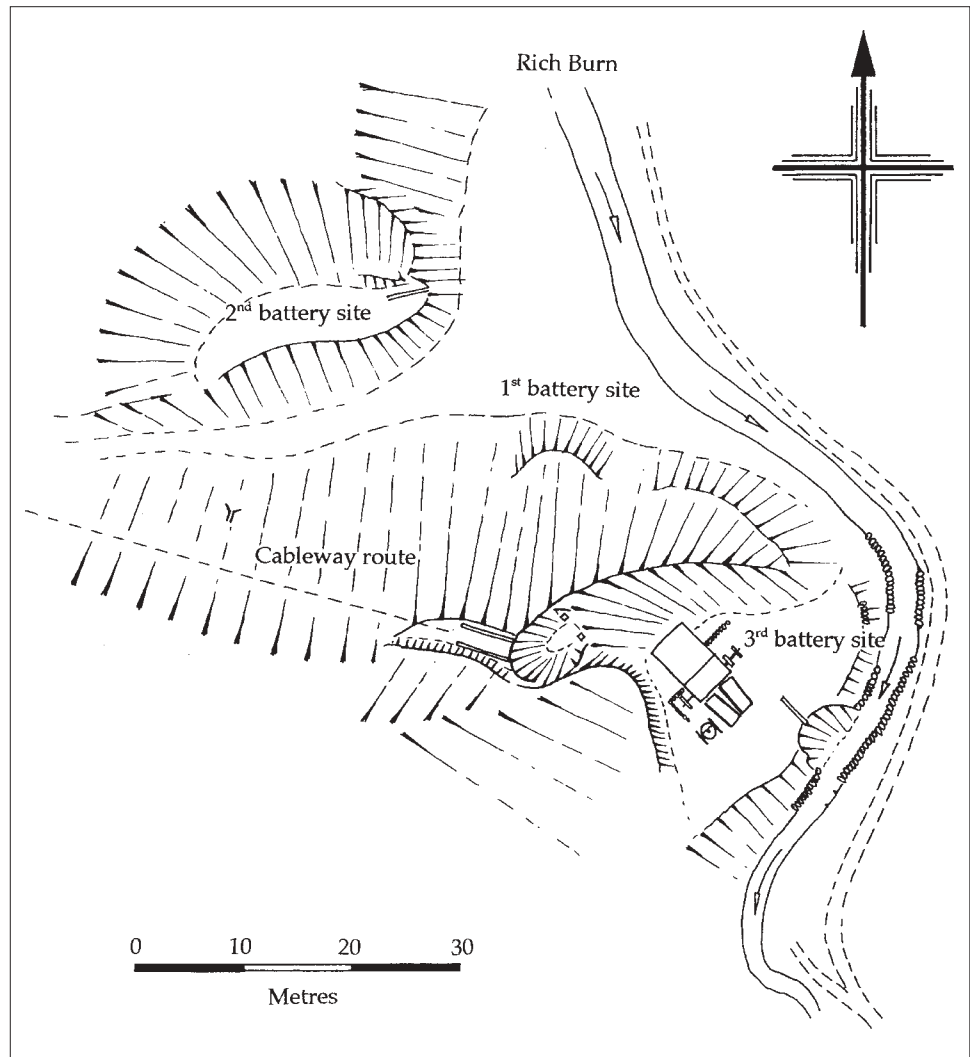


disassembled Wilfley concentrating table. A jaw rock crusher is sitting in the battery structure, although it was originally mounted to the rear and above the mill.

The battery was originally housed in an iron and timber battery shed, of which nothing now remains. Contemporary photographs show it complete (Fig. 16), and at a later date when the iron had been stripped away (Fig. 17).

The two battery sites of the first Homeward Bound Company (1876–84) were located nearby, on either side of a small gully just past the surviving battery (Fig. 18). The 'Little Wonder' of 1876 was down near stream level, and while the site was marked by a few pieces of rusting iron when visited in 1993 (Petchey

Figure 18. Homeward Bound Battery sites.



1996: 170), subsequent flooding has obscured any evidence. The site of the second battery (1879-84) is on a terrace above the Rich Burn. The site currently consists of a terrace cut into the hillside, with scattered sections of corrugated iron, tins and pieces of cast iron. No items of machinery remain, but the end of the head race and the outflow of the tail race can both be found, each cut into the rock. The tail race discharged straight over the rock face, into the stream below.

Above the existing battery structure (Fig. 19) is the site of the ore hopper and terminus of the aerial cableway. The cableway pylons with their cast iron guidewheels follow a straight line up the hill to the site of the top ore hopper and cableway return wheel (Fig. 20). The return wheel is very similar in design to the return wheel at Skytown, see Section 9.6 below. On the hillside above the hopper is the mullock heap from the upper levels of the mine, one drive of which is still open.

Climbing the hillside to the north of the cableway is a zig-zag track which ascends to the ridge top. From there an indistinct track can be followed which leads to the series of workings along the line of strike, including the Lady Fayre shaft and the Golden Link, before dropping into Sawyer's Gully and the site of the Maryborough/Premier operation (see Chapter 10 below).

Figure 19. The remains of the third Homeward Bound Battery (ex OPQ). The roof on the structure is a recent addition to slow down the deterioration of the timbers. The berdan is in its correct position, but the camshaft and Wilfley table have been dismantled.
Photo: P. Petchey.



Figure 20. The Homeward Bound aerial cableway top return wheel.
Photo: K. Jones, Department of Conservation, Wellington



7.10 SUNRISE BATTERY SITE AND OFFICE

The history of the Sunrise Mine is described below in Chapter 11 below. The mines were located high up the mountain, while the battery was built much lower down beside the Rich Burn, some 600 m upstream from the Homeward Bound site.

7.10.1 Archaeological description

The site of the Sunrise Battery and the surviving office building is on the true right of the Rich Burn ('Z' on Map 4, p. 25), near the confluence with Advance Creek. The battery site consists of a level area beside the creek, protected from erosion by revetment. There is a line of schist piles built along the back of the

terrace. The machinery has been removed (and partly comprises what is now Anderson's Battery), and so little remains on site. There are a few stamper shoes scattered about.

The mine office is located just upstream of the battery site (Fig. 21). It is a small weatherboard building with a corrugated iron roof. Floods have regularly washed through it and gravel has accumulated around and in the building so that the ground level is now at the base of the windows.

On the other side of the stream from the building, at the confluence of Advance Creek and the Rich Burn, is the pipe inlet structure for the Homeward Bound pipeline that supplied water to the third (existing) battery. The pipes themselves have long since been removed.

7.11 HUT SITES AND TRACK TO ADVANCE PEAK

About 700 m upstream from the Sunrise office the track forks, the upper branch climbing up to Advance Peak, and the lower branch continuing on towards the Premier Mine in Sawyer's Gully (see Chapter 10 below).

At least five hut sites were located near the fork in the track, four on the true left and one on the true right of the Rich Burn. It is not clear whether these huts were associated with the Premier Mine or some of the Advance Peak workings, although it is possible that they were used by a mixture of miners from the various companies working in the area.

Figure 21. The surviving building at the Sunrise Battery site.
Photo: P. Petchey.



8. Scanlan's Gully (Map 3)

A number of mines operated in Scanlan's Gully (sometimes Scanlan Gully or Scanlon's Gully) and its branches, of which the largest and most profitable was the Tipperary. Others were Anderson's Mt. Verde Mine and Balch's Mine.

8.1 THE TIPPERARY MINE

The Tipperary Reef was the first main line of lode opened at Macetown, and the Tipperary Mine was to become one of the most productive of the Macetown quartz mines. The lode was first opened out in 1875-76 by Thomas Hall. Two versions of the discovery exist. Veitch (1972) recounts that Hall pegged out the most promising outcrop in the valley, and then allowed a group of Chinese miners to sluice away the soil overlying the lode, thus getting the ground opened out at no cost and only a little loss of gold. Ng (1993: 229) gives a similar account. Miller (1966: 163) gives a slightly different version, whereby Hall followed a trail of dirty water coming down Scanlan's Gully, finding a small group of Chinese miners sluicing away the free gold on the cap of the reef, unaware of their discovery. Hall quickly pegged out the reef. Whichever version is correct, Hall was apparently guilty of some dubious business practices, and the mine was embroiled in litigation until the beginning of 1878. It then produced some very good returns, including a 501 oz cake of gold in December 1881 (Veitch 1972).

In 1879 a battery was constructed in Scanlan's Gully (A.J.H.R. 1880 H26: 26). It consisted of ten heads of stamps, a berdan and a buddle, driven by a Whitlaw water turbine 3 ft in diameter (A.J.H.R. 1886 C4: 20; Veitch 1972). Until that time much of the Tipperary ore had been crushed at the Public Battery.

To raise ore in the mine, a water balance was constructed. This consisted of a wheeled tank placed on an inclined tramway with the same length as the depth of the shaft in the mine. The tank was filled with water at the top of the incline, and was then allowed to descend to the bottom. The tank was connected by a cable to a box in the shaft, in which the ore was placed. The descending tank raised the ore, and then the tank was emptied and was drawn again to the top of the incline by the descending ore box in the shaft, ready for another load (A.J.H.R. 1886 C4: 20). Although this was ingenious, it was too slow in operation for the efficient working of the mine (Veitch 1972).

This, amongst other problems, caused the mine to close in 1888 (Veitch 1972). It was reopened in 1893 after the West Argentine (Westralia) Gold Company (Ltd) was floated and raised the capital to start operations. The mine was put back into working order and a tramway laid to the battery. Work in the upper levels of the mine was suspended, and a low-level adit was constructed, reaching a length of 1927 ft before the old workings were encountered in February 1886 (Veitch 1972).

The company also constructed a furnace at the battery with which to fire the concentrates after processing in an attempt to improve gold recovery. This was finished in January 1897 (Veitch 1972).

In 1898 a new winding plant was installed to raise ore from the lower workings to the main adit. A 20 hp oil engine was installed in a winding chamber measuring 30 ft by 9 ft, located 2000 ft underground. Unfortunately, the fumes from the engine made the mine unworkable, and despite some modifications, including a change in fuel, the delays and expense in the scheme caused the mine to be shut down again (Veitch 1972).

In 1903 the Indian Glenrock Company took over the mine and repair work commenced. It was found that the chamber on the hauling shaft had broken down, and the tramway had been damaged by floods. The mine was once again shut down in 1905, this time due to other problems within the company that owned it (Veitch 1972).

8.2 BALCH'S MINE

Balch's reef (the New Caledonia) was discovered in Caledonian Gully, off Scanlan's Gully, by Richard Balch in 1905. An early crushing of 25 tons of quartz yielded 52 oz 10 dwts of gold, and this encouraged further work. The good yields lasted for a while, with crushing being carried out at the old Tipperary Battery, but by 1907 the stone had given out, and work ceased (Veitch 1972). The mine was sold to the Anderson Brothers (Beaton 1971: 46).

8.3 ANDERSON, HANNAH AND PARTY

Anderson and Hannah's claim, the 'Mt Verde Mine', was situated at the junction of Scanlan's and Caledonian Gullies. In 1907 they purchased the old Sunrise Battery (then owned by the Premier Mine, and possibly moved up to that site) and transported it down to the junction of Scanlan's Gully and the Twelve Mile Creek (Rich Burn), where it still stands today. Work continued intermittently until about 1910, one of the problems being lack of water to drive the battery (A.J.H.R. 1909 C3: 36; Veitch 1972).

The mine was briefly reopened by the United Goldfields of New Zealand Company after the First World War, and a new level driven, but work was abandoned in 1921 (A.J.H.R. 1921-22 C2: 30).

8.4 ARCHAEOLOGICAL EVIDENCE IN SCANLAN'S GULLY

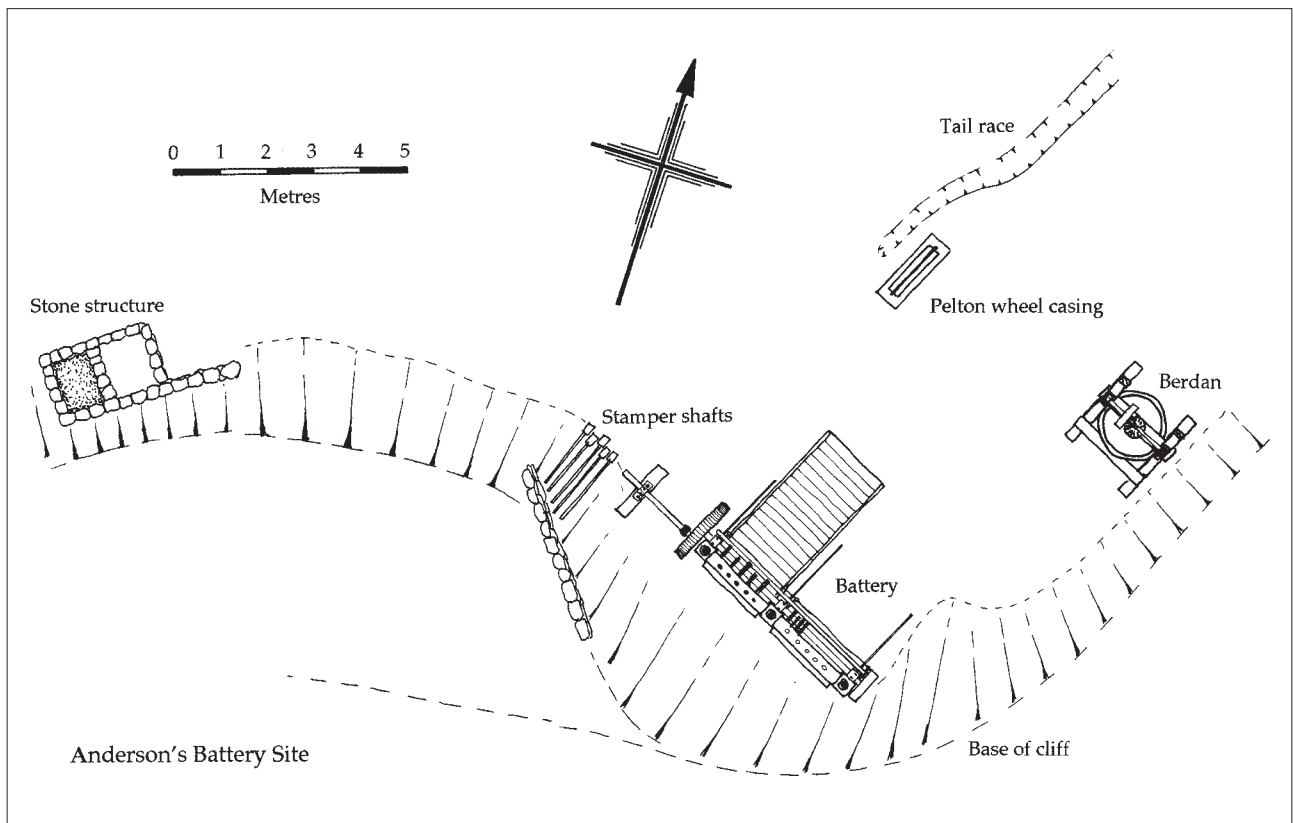
The track up Scanlan's Gully starts at Anderson's Battery site (Figs 22 and 23; 'A' on Map 3, p. 24).

The battery is iron-framed, and is the only one of its kind in Otago. Built as a ten-stamp battery (two sets of five stamps), one set of stamper shafts has been removed, and the shafts are presently lying on the ground beside the structure. The battery was powered by a Pelton wheel, which has been removed since the 1970s, although the iron casing for the wheel remains. The berdan, used for fine

Figure 22. Anderson's Battery site.
Photo: P. Petchey.



Figure 23. Plan of Anderson's Battery site.



grinding, is still in situ in line with the end of the stamper camshaft, from which it was driven via a canvas belt. The battery and equipment stands in the open, although the battery shed survived until the 1970s (Fig. 24). Photographs show it as a weatherboard building with an iron roof. Exposure to the elements is causing decay of the remaining timber elements (berdan frame, battery tables and pulleys), with noticeable deterioration between 1993 and 2000.

At the mouth of Scanlan's Gully there is some revetment on either side of the creek. Some of this is associated with the road that ran up the gully. As one

walks up the gully, sections of the carefully built road are obvious, with revetment both beside and below the road in places. Some parts of the road have been destroyed either by slips or by stream erosion.

The Tipperary Battery site and furnace are located about 500 m up the gully, on the true left of the stream (Figs 25, 26 & 27, and 'L' on Map 3, p. 24). Floods in November 1999 badly damaged the site, depositing a thick layer of gravel and washing away the old stream banks. No machinery remains on site. There is a revetted embankment, which was probably where the ore was fed down into the stampers. The stone furnace, located beside the battery site, is still partly standing, although the stonework is becoming increasingly decrepit.



Figure 24. Anderson's Battery in January 1967. The battery shed stood until the 1970s. Since then, the decay of the machinery that remained on the site has been rapid.

Photo: Department of Conservation, Dunedin.

The Tipperary Mine tramway led upstream from the battery to the mine, but the section between the battery and Caledonian Gully is not well preserved. A short distance beyond the battery there is a structure cut into the true right bank, consisting of several old stamper rods used to support a portal or roof. It could be an adit or drive entrance, although there is no record of a mine at this location.

Just short of the Caledonian Gully confluence, on the true left bank, is the open lower drive of Anderson's Mine and a small timber and iron hut ('N' on Map 3) containing a number of galvanised iron pipes (probably for underground mine ventilation). Around in Caledonian Gully a zig-zag track climbs up the hillside to a number of collapsed drive locations (probably the upper levels of Anderson's Mine, 'M' on Map 3) and at least one hut site. Ore was sent to the valley floor from the upper drive along a chute, part of which was cut through a rock knob. There is some archaeological evidence that a short aerial cableway may have been employed at some time.

Just upstream of Caledonian Gully is the location of the Tipperary low-level drive ('O' on Map 3). Although it has caved in, the location is obvious as orange-stained water continues to seep out of the old workings. Close by the drive is the site of the blacksmith's forge, with fragments of clinker and slag scattered about.

In front of the low-level drive and the blacksmith's the formation of the Tipperary tramway can be seen. It is well preserved from this point up almost as far as the mine site. It runs along the true left of the creek, and in places has been carefully revetted to protect it from erosion.

Figure 25. Tipperary Battery c. 1900. The furnace can be seen under the open-sided shelter to the left of the building housing the battery.
Photo: Lakes District Museum, Arrowsmith.



Figure 26. The Tipperary furnace. The gravel was deposited around the structure by floods in 1999.
Photo: P. Petchey.



On the opposite bank of the stream seven hut sites were identified, two of which comprised substantial stone ruins. Five further hut sites were clustered on the same side as the tramway at the confluence of Scanlan's Gully and Tipperary Gully. Two of these are on the true right of the Tipperary Creek, on a small terrace. The other three are on the other side of the creek, on a sloping terrace. The remains of a Shacklock cast iron coal range are sitting close to one site.

The tramway formation continues up Tipperary Gully, although slips and erosion have now destroyed much of it. A further three hut sites are located well above the gully floor on the true right of the stream.

The unstable nature of the rock means that very little remains to be seen of the Tipperary Mine ('P' on Map 3, p. 24). This hillside was prone to slipping even when the mine was in operation. At the base of the hillside there is a jumble of

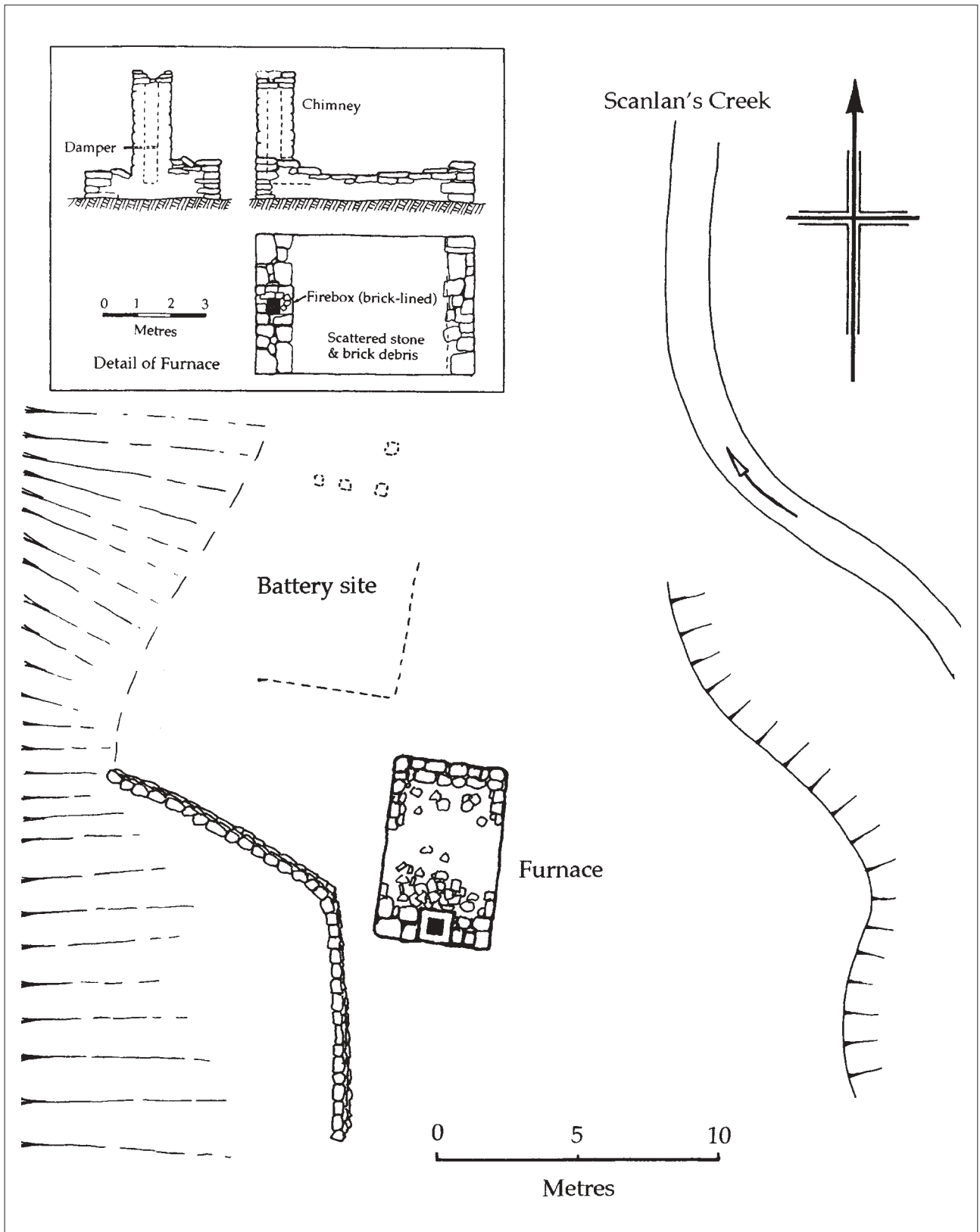


Figure 27. Tipperary Battery and furnace site. The battery site is now completely covered in flood gravel.

coils of wire rope, timbers, ironwork and revetment, confirming that much archaeological material lies buried and mixed in the slip material. Several short water races are visible on the opposite side of the gully.

9. Sylvia Creek (Maps 3 and 4)

A number of mining operations were based in Sylvia Creek and one of its tributaries, Bush Creek (Maps 3 and 4, pp. 24-25). The remains of two batteries—the United Goldfields and the All Nations—stand on the banks of the creek, and the remains of an impressive aerial cableway climb up from the valley to the site of ‘Skytown’, a small cluster of huts and mines at high altitude.

9.1 THE ALL NATIONS COMPANY

The All Nations Company is first mentioned in the Warden’s Report for 1876. The company had driven both a tunnel and a shallow shaft to meet a reef that was expected to yield 4 to 6 oz of gold per ton (A.J.H.R. 1876 H3: 4). By 1878 expectations were still optimistic, but down to 1 oz per ton. The company by that stage had erected their own crushing battery, described as:

‘A four-stamper battery, situate about half a mile from the claim. The machinery is very compact, having full power and weight, and attached is some very ingeniously constructed apparatus for dealing with the tailings by means of a concentrator and amalgam barrel.’ (A.J.H.R. 1878 H4: 19).

Crushing was held up in late 1878 due to flooding that hindered all the local enterprises, but by the end of March 1879 work had recommenced. Expectations were still for rich returns, as the last crushing before the flooding had yielded over 1½ oz per ton (A.J.H.R. 1879 H11: 24).

At registration, the company had been fully paid up with £28,000 in £1 shares. However, this proved insufficient and the company fell into debt. In 1881 it was reconstructed as the New All Nations. By 1885 it was one of the only three quartz reef mining companies still operating at Macetown (along with the Tipperary and Premier), but its work was only of a prospecting nature (A.J.H.R. 1885 C2: 11). In 1888 the reconstructed company went into liquidation (Powell 1976: 32).

The battery was left on site, and was later repaired and put to use by the New Garibaldi Company working the Garibaldi claim, which bordered the All Nations claim. This venture met with no success (Powell 1976: 33). Subsequently, the battery was partially covered by a slip, and was abandoned for a time. Then, in 1895, it was cleared and repaired by Messrs Grinstead, Ford, Elliot and Pitt, who were working the old Victor Emmanuel claim in an attempt to attract investment from London (A.J.H.R. 1895 C3: 89; Powell 1976: 61). Once again, this venture was not successful, as no payable stone was found (A.J.H.R. 1896 C3: 107).

In 1913, New Zealand Consolidated Mines, which had recently re-opened the Garibaldi and Homeward Bound workings, commenced work at the All Nations. An aerial cableway was constructed, this being the one that can still be found (see below) (A.J.H.R. 1913 C2: 34). Work had ceased by 1920.

9.2 GARIBALDI MINE

The Garibaldi lode was discovered and opened up by October 1877, and in 1878 a tunnel was driven, but little good stone was struck. In 1880, the Garibaldi Gold Mining Company was registered to reopen the lode, and some good blocks of stone were struck (Veitch 1972). However, the ore had to be sledged down to Bush Creek and then taken by dray to a battery, which added greatly to the expense. In 1887 the lease and property were sold by the bailiff of the Queenstown Warden's Court, and soon after that the claim was incorporated into Farrell's Consolidated Mines (Veitch 1972).

The mine was reopened by New Zealand Consolidated Mines (Limited) (later the United Goldfields Mining Company) between 1909 and 1919.

9.3 VICTOR EMMANUEL COMPANY

The Victor Emmanuel Quartz Mining and Crushing Company was set up in 1876, and although work on the mine got underway, no battery was constructed and the ore was crushed at the All Nations Battery (Veitch 1972). The mine produced some promising results, but was closed down and sold in 1881.

The mine was opened again in about 1894, and the All Nations Battery dug out from under a slip and repaired. This work was undertaken on tribute in an attempt to attract investment from London (A.J.H.R. 1895 C3: 89; Powell 1976: 61). This was not successful, and the mine again closed down (A.J.H.R. 1896 C3: 107).

9.4 UNITED GOLDFIELDS BATTERY

This battery, constructed from parts of other batteries, was erected by the United Goldfields Company of New Zealand in about 1910 to rework the All Nations and Garibaldi mines (Veitch 1972).

9.5 ARCHAEOLOGICAL EVIDENCE IN SYLVIA CREEK

The walking track up Sylvia Creek once followed the old mine track formation, but this has now been largely destroyed by erosion and flooding. About 200 m up the Creek, on the true right, there is a small section of revetment let into the bank, with a possible hut terrace above.

Four hundred metres further on are the United Goldfields Battery and an associated building terrace (Fig. 28 and 'Q' on Maps 3 and 4). The battery is intact, but is becoming quite decrepit. A small slip has come down behind the battery, while the stream is eroding the ground in front of the structure. The battery is unusual in that it has concrete foundations, timber being more commonly used. This may be related to its relatively late date of construction (1910).

Figure 28. The United Goldfields Battery.
Photo: P. Petchey.



Above the United Goldfields Battery the original mine road survives in sections, and leads on to the All Nations Battery 200 m further up the valley. Just before the battery is reached, there is a building terrace cut out beside the track which contained at least one hut or building site.

The site of the All Nations Battery (Fig. 29) is on the true right bank of Sylvia Creek. It consists of the remains of the battery and water wheel, although these are quite decrepit (Fig. 30 and 'R' on Maps 3 and 4). The head race is clearly defined, meeting with Sylvia Creek a short distance upstream, past the site of an old smithy on the opposite bank.

The blacksmith's is a stone building, and still contains parts of a cast iron portable forge and blower. The remains of posts in the ground beside the building indicate that there was originally a small cluster of structures at the site. The beginning of the track up Bush Creek to Skytown (see below) leads up behind these building sites.

On the other side of the valley (east side) there are at least four hut sites cut into the hillside. A short benched track leads to the upper two huts. Above these is one of the long water races that supplied water to the sluicings above Macetown. Some of the timber framework to support fluming survives around a bluff directly above the site of some of the huts.

Also visible is the bottom of the aerial cableway which carried ore to the battery ('Ra' on Map 4). The cableway pylons can be seen on spurs leading up into the mountains. At the top of the cableway is 'Skytown'.

9.6 SKYTOWN

'Skytown' was the unofficial name given to the small settlement of huts near the All Nations and Garibaldi mines and the head of the All Nations cableway in the head of Bush Creek ('Rb' on Map 4). The derivation of the name is obvious once

Figure 29. All Nations
Battery c. 1897.
*Photo: Museum of New
Zealand Te Papa
Tongarewa (c.014900).*

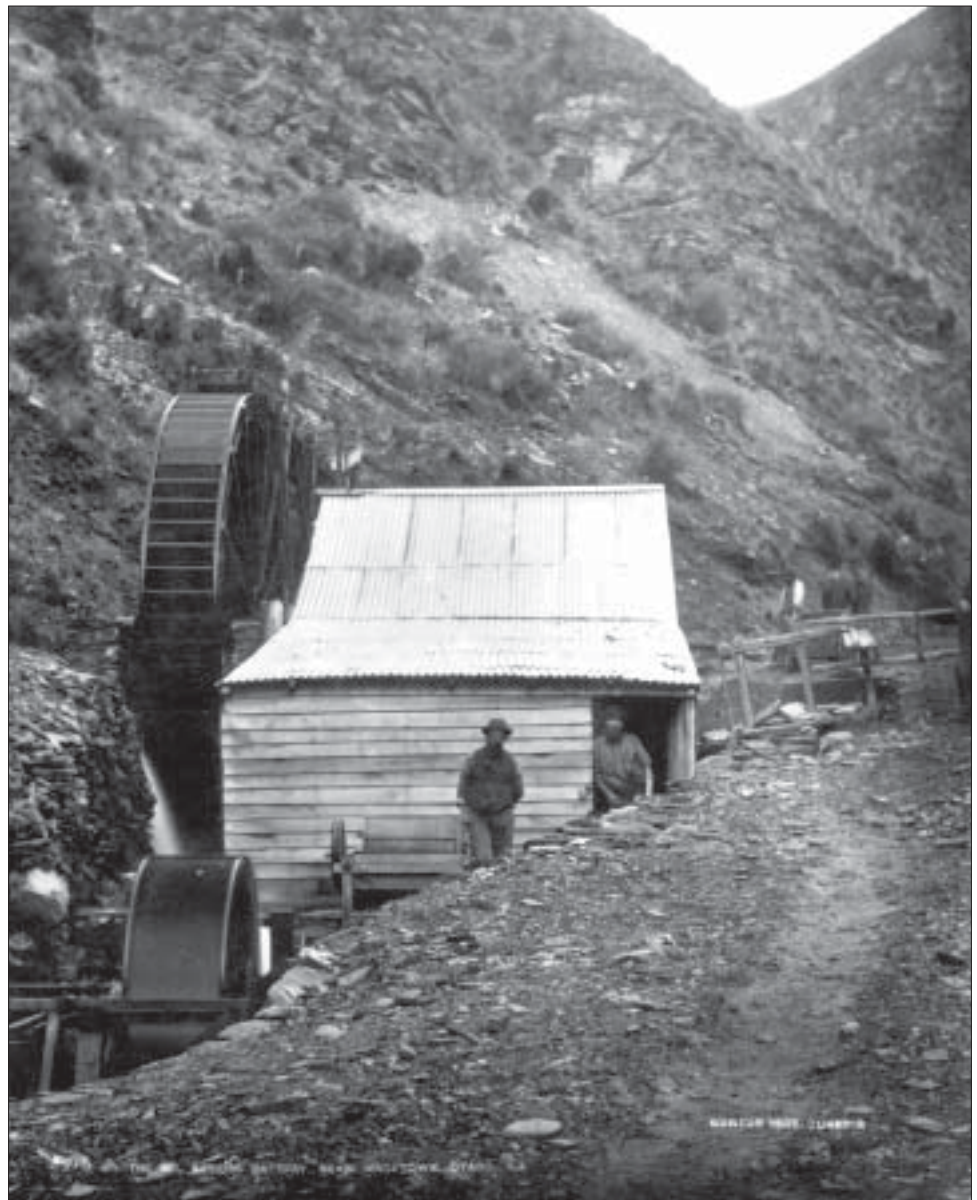


Figure 30. All Nations
Battery.
Photo: P. Petchey.



the site has been visited. The track from the All Nations Battery and smithy climbs up the north bank of Bush Creek, past the paved floor of a hut, and then crosses the creek to climb steeply up to Skytown. Parts of the track have slipped away, and much care is required as there are some very steep drops. Not located during the present survey was the Victor Emmanuel Mine, which was situated on the hillside near the start of the track. Two contemporary photographs of Skytown show, firstly (Fig. 31), its location high above Bush Creek and, secondly (Fig. 32), the steepness of the site.

Figure 31. View looking northwest of the confluence of the Arrow River (flowing in from the right) and Rich Burn (Twelve Mile Creek). Skytown appears as the pale scar high on the distant hill (a spur of Vanguard Peak, which is the highest point in the photograph). Note the mass of sluiced-out debris in the river beds and the small huts and other structures on the true right of the Rich Burn.
Photo: Museum of New Zealand Te Papa Tongarewa (c.015169).



Figure 32. Skytown.
Photo: Lakes District Museum, Arrowtown.



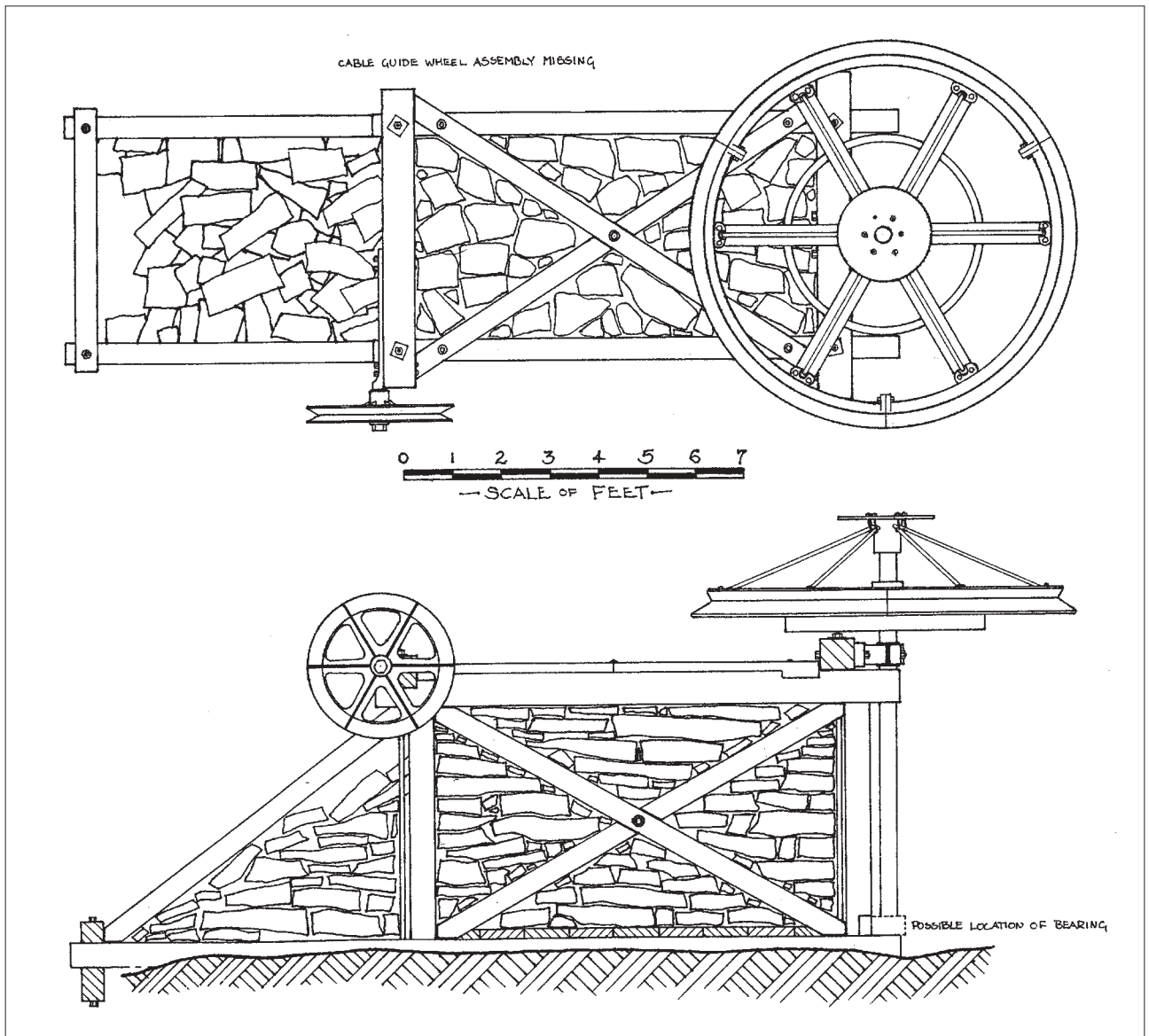
From the track the pylons of the aerial cableway are visible on the opposite side of the valley, as is the route of a slightly lower track or cableway. The exact nature of this lower feature is unclear, but heavy cables strung across a crevasse indicate that some effort went into its construction. It presumably pre-dates the main cableway, and was for transporting ore to the battery.

At Skytown, the track first leads to the intact top return wheel of the aerial cableway and the partially collapsed quartz hopper, which is still full of quartz (Figs 33 & 34). The return wheel structure is in very good condition, although one cable guide wheel is missing.

Figure 33. The All Nations aerial cableway top return wheel. Note the similarity to the Homeward Bound wheel (Fig. 20).
 Photo: P. Petchey.



Figure 34. All Nations cableway top return wheel. Drawn by P. Petchey from sketch and measurements made in the field by K. Jones and from photographs. This structure is very similar to the Homeward Bound return wheel, which was built by the same company at the same time. Note that one guide wheel is missing.



It is very similar to the Homeward Bound top return wheel (see Fig. 20), which was built at the same time by the same company, New Zealand Consolidated Mines (Limited), presumably using the same plans and parts.

Nearby are the mines and the site of Skytown. Several hut sites can be easily found, set out in a row beneath a bluff. These huts are shown in one of the only contemporary photographs of Skytown (Fig. 32). Below the huts there is a tramway or track bench, which ran between the ore hopper and the bottom of the short Garibaldi Mine cableway. Other tracks link the various mine workings in the area, of which the main two were the All Nations and Garibaldi.

On the hillside above the hut sites is an open adit and the top return wheel for a small cableway. This is probably part of the Garibaldi Mine complex.

10. Sawyer's Gully: Maryborough/Premier Mine (Maps 4 and 5)

Sawyer's Gully (also called Sawyers Gully and Sawyer's or Sawyers Creek) (Fig. 35) was the location of several mining operations, the largest and most enduring of which was the Maryborough/Premier mine. Other companies and mines included the Gladstone and General Havelock.

10.1 THE MARYBOROUGH MINE

The Maryborough Company was registered in 1876, working on the Tipperary lode line (Powell 1976: 32). The 1876 Warden's Report stated that the company was 'engaged in sinking a shaft on the line of the reef, or rather following the lode down' (A.J.H.R. 1876 H3: 4). In 1878 the company erected a crushing mill at Sawyer's Gully, of five stamps driven by a 30 ft water wheel. It did not start operation until late 1879, because of damage by floods in September, 1878 (A.J.H.R. 1879 H11: 24).

Figure 35. Sawyer's Gully.
Note the small buildings
along the stream.
*Photo: Museum of New
Zealand Te Papa
Tongarewa (c.014901).*



In 1882 the company was reported to have averaged some 4 oz of gold per ton from some 300 tons of ore, but these good returns cannot have continued as by 1886 it had passed into liquidation. The plant was purchased by the neighbouring Premier Company for £792/3/- (Powell 1976: 29). By this time the battery had been extended to ten stamps, each weighing 7 cwt, and was equipped with one berdan. The 30 ft overshot water wheel (Fig. 36) still provided the power (A.J.H.R. 1886 C4: 21).

10.2 THE PREMIER MINE

The Premier Company also started work in the late 1870s. It did not erect a battery, instead doing its crushing at the Maryborough Battery until it bought that plant. In 1890 the Premier Company went into liquidation and was floated on the London market. It was taken up by the Glenrock Company, and was

Figure 36. The Maryborough Battery during construction (c. 1879).
Photo: Museum of New Zealand Te Papa Tongarewa (c.016028).

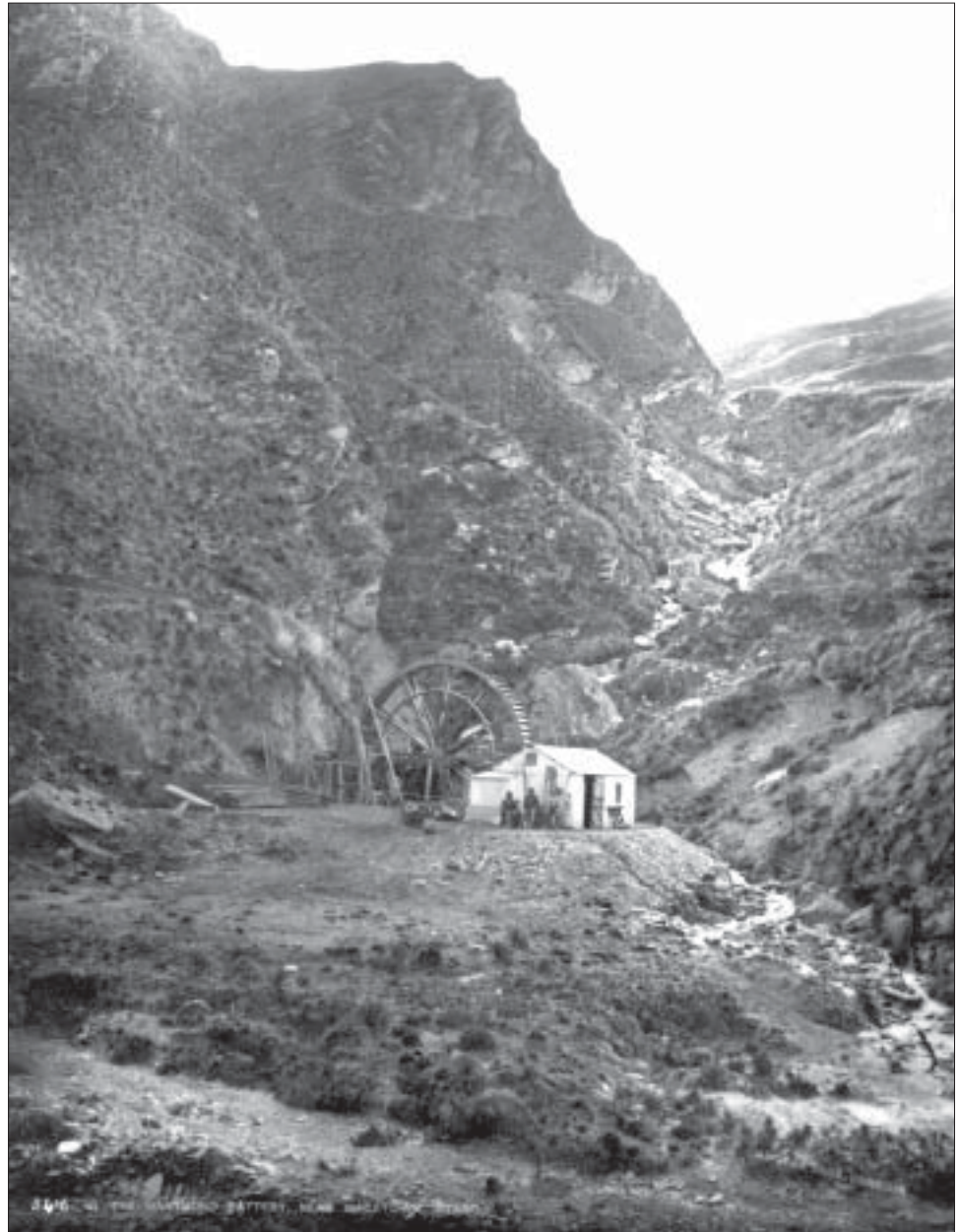




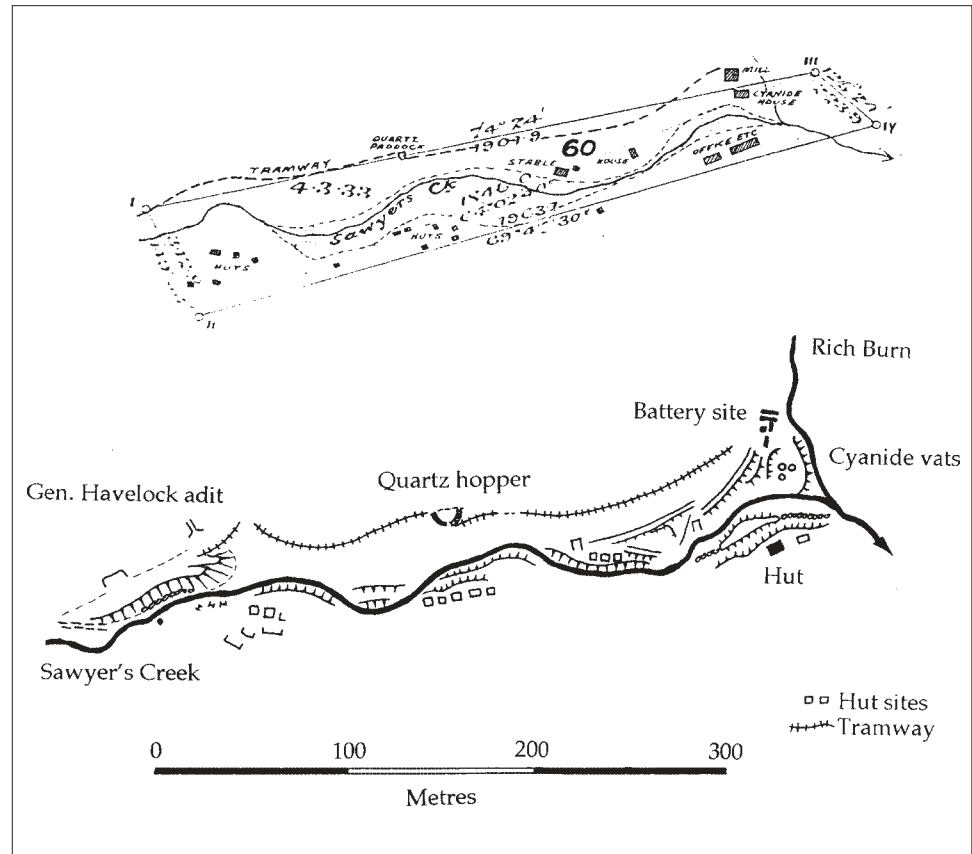
Figure 37. A group of miners at the Premier Mine c. 1890.
 Photo: Lakes District Museum, Arrowtown.

reconstructed as the Premier Consolidated Company. A new low-level drive was constructed from the level of the creek to improve the operation of the mine (A.J.H.R. 1891 C4: 52) (Fig. 37).

In late 1891 the water wheel was replaced by a 6 ft Pelton wheel (A.J.H.R. 1892 C3: 60). In 1893 a further ten heads of stamps were added to the mill, and a cyanide plant was erected, consisting of 'two circular

solution vats, one sump, and a tank for making the solution up to the required strength' (A.J.H.R. 1894 C3: 83). The extra stamps possibly came from the nearby Sunrise Battery, which was purchased in 1893 for £750 (Powell 1976: 55). During 1892 and 1893 a tramway was constructed from the Premier Mine down the gully to an ore hopper, and then from the bottom of the ore hopper a second line ran to the top of the battery (see Fig. 38) (A.J.H.R. 1893 C3: xv). These features are still obvious (see discussion below).

Figure 38. Comparison of 1898 plan of Sawyer's Creek (surveyed for Glenrock Consolidated Ltd with an enlargement of part of Map 4, showing archaeological features in Sawyer's Gully. The plans are produced to the same scale.
 Plan S.O. 7056: Land Information New Zealand.



By late 1894, another new low-level drive was completed, and all outside works finished, but the parent company, the Glenrock Company Limited, stopped all payments. Work in the mine ceased in November 1894, and it was sold in February 1895 at auction. After a failed attempt by Farrell (of New Zealand Consolidated Goldmines) to buy the mine, it was sold to the Glenrock Company, who now had sole ownership (A.J.H.R. 1895 C3: 90). Work recommenced.

In October 1895 an electric winch was installed at the mine for hauling ore, powered by a generator running off the mill shaft. By 1897, the battery consisted of 30 stampers, arranged in two separate mills but apparently all running off the same Pelton wheel. Periodic water shortages meant that the crushers and hauling equipment could not always be run at the same time, so in 1903 a separate power house was built. This measured 30 ft by 10 ft and housed a turbine working under 200 ft of vertical pressure, driving a dynamo (A.J.H.R. 1903 C3: 108).

By this time the mine was beginning to face other problems. The depth of the workings—some 3100 feet from the surface—combined with the age of some of the timbering, was causing difficulties with tunnel stability. Two men were employed repairing and renewing timbering. There were also problems with ventilation and the power supply.

The company underwent a series of restructurings under Glenrock ownership, until in 1903 the Premier-Sunrise (N.Z.) Gold Mining Company (Ltd) purchased the mine (A.J.H.R. 1904 C3: 65). Near the end of 1904 the good run of stone that the deep workings were following cut out, and despite attempts to relocate more good stone, it was not found. In June 1905 the lower workings were abandoned, and in July the entire mine was closed (Veitch 1972). The claim was bought by the Sligo brothers, who intended to sluice the Premier Gully using the available water power (A.J.H.R. 1907 C3: 35; Powell 1976: 55), but the bed of the gully was found to be deep and rough (A.J.H.R. 1909 C3: 35).

10.3 THE GLADSTONE MINE

The Gladstone mine produced some fantastically rich returns for a short time, but the rich stone was quite rapidly worked out. A shaft was sunk 70 ft by January 1878, and a crushing of the reef that was encountered gave 3.75 oz to the ton. Excellent returns continued until the end of 1883, but by February 1884 work was suspended as the stone was exhausted (Veitch 1972).

10.4 THE LADY FAYRE MINE

The Lady Fayre Company pegged out its ground in 1876 and sank a shaft which struck good stone. The company then dug a horizontal drive in from the mountainside, and encountered three shoots of stone. Initial crushings were carried out at the Public Battery, but all later work was done at the Maryborough Battery (Veitch 1972).

In 1881 a double gravitational tramway was constructed from the tunnel to the road in Sawyer's Gully, where it was then drayed to the mill (Veitch 1972). It was abandoned when the easily accessible quartz was worked out.

10.5 ARCHAEOLOGICAL EVIDENCE IN SAWYER'S GULLY

The archaeological evidence of the Maryborough and Premier Mines are the main features in Sawyer's Gully. The battery site, cyanide tanks and an intact miner's hut are located close to the confluence of Sawyer's Creek and the Rich Burn. The Premier Mine was located further upstream, in a side gully, while the Maryborough Mine was high on the hillside at the head of the gully.

At the battery site (Figs 39, 40 and 41 and 'T' on Map 4, p. 25, and Map 5, p. 53) the 1878 support frame for the water wheel is still standing in situ, despite the wheel itself having been removed in the 1890s. Beside it are the remains of the twenty-stamp battery that stood here. One mortar box and a portion of another are all that now survive. Just behind them stands a masonry support. In front of the stamper foundations there is a building terrace, originally occupied by a corrugated iron battery shed. To the south of this terrace there are the cyanide vats constructed in 1893.

On the true right of Sawyer's Creek there is a collection of mining equipment (probably gathered there by visitors to the site) and an iron musterer's hut in sound condition ('U' on Map 4, p. 25). The interior is lined with 1930s Otago newspapers, which suggests that it was utilised by miners during the Depression. It is on the site of the old mine offices (see Fig. 38), and may date to the later part of the 1876–1906 life of the mine. Immediately beside it is a hut site, with the remains of a stone chimney.

Numerous hut and building sites are scattered up the gully, while others are known to have existed (present in contemporary photographs), but are not now visible. Seventy-five metres upstream from the standing hut, on the opposite side of the creek, there are five further building sites (including the stables and house shown on Fig. 38), while another 100 m upstream (back on the true right) there is a row of five ruined huts. A cluster of five more hut sites is located another 100 m up the gully, opposite a very large mullock heap. This makes at least 17 hut or building sites that are still easily found in the gully, with more sites certainly destroyed by the post-closure sluicing or simply not now visible on the surface.

There are also a large number of mine infrastructure remains. From the battery, a tramway formation runs up the true left of the gully to the remains of the ore hopper. From the top of the ore hopper an upper tramway runs across the top of a very large mullock heap towards the Premier Mine adit ('X' on Map 4). The mullock heap has a flattened top, and was obviously an important industrial activity area. Various items of ironwork are still scattered about, including a cast iron generator bed. On the gully floor below the heap there are numerous iron trolley wheel sets, an iron winding drum, and a variable resistance controller for the mine generator (Fig. 42).

The mouth of the General Havelock Mine (caved in) is located at the downstream end of the mullock heap ('Y' on Map 4).

Continuing upstream, a small gully on the true left of the main creek is the site of the Premier Mine low-level drive. This is still open, and there is a small collection of mining equipment in the mouth of the drive. A shaft (now



Figure 39. Maryborough/
Premier Battery site from the
northeast. On the left are the
cyanide tanks, and to the
right the remains of the
stamper frames and the water
wheel frame. The Rich Burn
runs in from the right, and
Sawyers Creek is on the left.
Photo: P. Petchey.



Figure 40. Maryborough/
Premier Battery stand and
water wheel race supporting
structure from the southeast.
*Photo: K. Jones, Department
of Conservation, Wellington.*



Figure 41. Maryborough/
Premier Battery cyanide vats
from the west.
*Photo: K. Jones, Department
of Conservation, Wellington.*

collapsed) was located further up the hillside directly above the drive mouth. The Gladstone claim was also located in this small gully, running between the entrance of the Premier mine and the main gully. The entrance of the Gladstone mine was not located during the survey.

Back in the main gully, the tram formation leads around to the base of the incline tramway ('W' on Map 4), which brought ore down from the Maryborough mines high on the mountainside ('V' on Map 4). A short lower section of the incline has been damaged by a slip, but the majority of the formation can easily be followed. At the head of the incline some stone revetment and pieces of the top return equipment are visible, but the site has been damaged by earth movement.

The Maryborough mines themselves were in very steep country, and all appear to have fallen in, although some mullock heaps can still be identified. Some sections of the tracks which linked the mine drives can be followed, although once again much has slipped away.

From the top of the incline tramway a track leads back down to the bottom, crossing the incline near the top and then leading away down the hillside on the west side of the formation. Three hut sites were found in the tussock, placed to take best advantage of the sun.

Figure 42. Variable resistance controller for the Premier Mine generator.
Photo: P. Petchey.



11. Advance Peak: Sunrise, Germania mines (Map 5)

A number of small lodes were located on Advance Peak. While some of them gave good returns, operating costs were high in this elevated and exposed location. The Sunrise Mine, near the peak, was the highest gold mine in the Colony (Veitch 1972). Other mines were the Katherine, first worked by the Katherine Quartz Mining Company, and the Germania. The Keep-it-Dark Company was formed in 1878 or 1879, and was one of the main companies in the early years on Advance Peak, carting their ore down a track to the Maryborough Battery (Veitch 1972). In 1882 there was much interest in the Advance Peak ground, and a number of claims were pegged out. These included the Golden Fleece, the Golden Shoe, the Just-in-Time and the El Dorado (Veitch 1972).

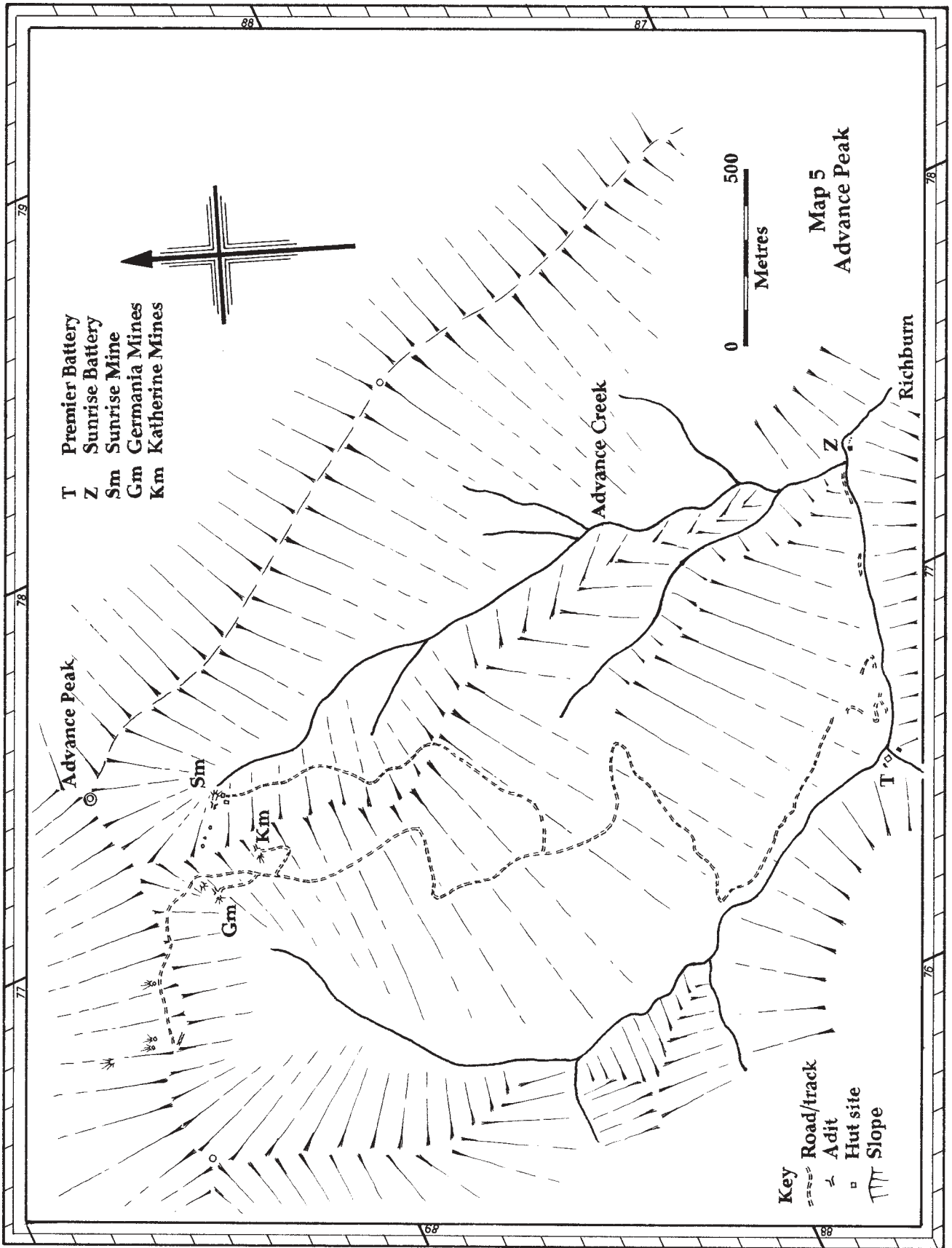
By 1883 most of the claims had been allowed to lapse, and in 1887 a new company, the Sunrise Company, took over much of the ground. In 1890 a large shed was built at the mouth of the tunnel, with a hut nearby that could house four men. The following year the company erected a ten head battery in the Twelve Mile Creek (Rich Burn), about a quarter of a mile below the Premier Battery (see Section 7.10 above). Ore was brought down the mountain in 30 cwt boxes mounted on a sled at the rear and low wheels at the front (A.J.H.R. 1891 C4: 52; Veitch 1972).

In 1892 the property was bought by the Premier Consolidated Company (A.J.H.R. 1893 C3a: 86), and a new low-level drive was planned but never built. The mine was abandoned in 1905, when the Premier Mine failed (Veitch 1972).

Between 1935 and 1938 the Ballarat Mine on Advance peak was opened, with several drives being cut on the Shotover side of the hill. The track up the Rich Burn and Advance Peak was repaired, and a small mechanical two-stamp battery driven by a 4 hp petrol engine was transported to the mine to test the ore (A.J.H.R. 1935 C2: 41; 1936 C2: 46; 1938 C2: 44). Of note was the fact that this was the highest gold battery in New Zealand, and it remained on site until illegally removed a number of years ago.

11.1 ARCHAEOLOGICAL EVIDENCE OF THE ADVANCE PEAK MINES

Advance Peak can be climbed from Macetown by two routes. A pack track climbs up from Cemetery Terrace, and follows a leading ridge to the summit. The other (and much easier) route is via the track up the Rich Burn, taking the uphill branch just before Sawyer's Gully. This route is steep but well constructed, and the track is in good condition. It is the track down which ore was sledged from the mine to the batteries for processing.



About half way up the mountain the track again branches. The right-hand branch goes around to the Sunrise Mine, where the mullock heap and two hut sites are located (Figs 43 and 45 and 'Sm' on Map 5). Above the adit mouth (caved in) are several prospect pits. To reach the other mines on the Peak one can either follow these pits over the ridge, or one can go back down the track and then up to the mines. The former is much quicker.

The Katherine and Germania mines are easily found, with benched tracks branching off the main track leading to them ('Km' and 'Gm' on Map 5). Both have obvious mullock heaps although in both cases the drives have collapsed.

Following the main track to the top ridge, it is easy to turn to the east (right) and climb to the summit of Advance Peak. To the west the track passes close to several large pits and mullock heaps and a prospect trench (Fig. 44) right on the ridge top. From the ridge one can look down into the Shotover Valley, another important historic goldmining area.

Figure 43. The Sunrise Mine on Advance Peak, nearly a mile high. The mullock heap and steep benched track are clear. The shadow of Advance Peak is thrown across the slope in the autumn sun.
Photo: P. Petchey.



Figure 44. Prospect trench on the ridge top of Advance Peak.
Photo: K. Jones, Department of Conservation, Wellington.



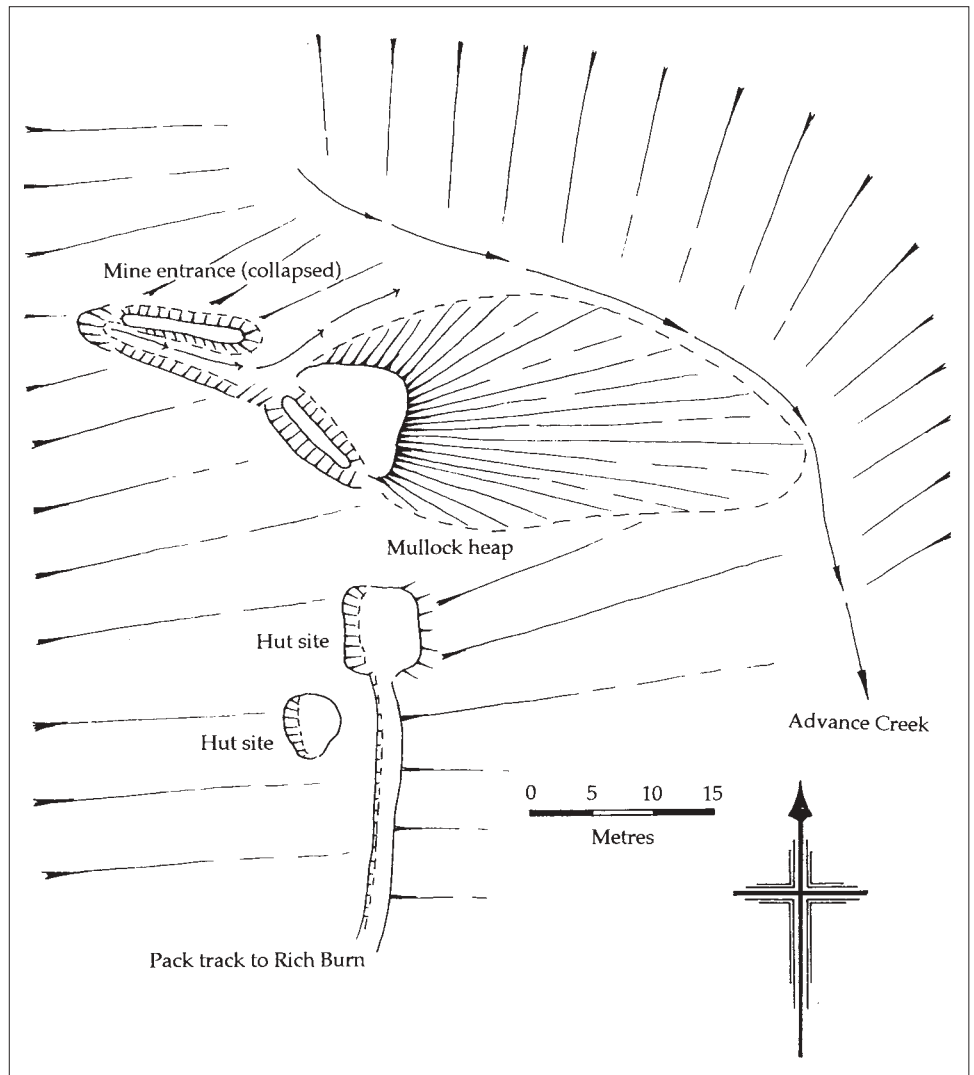


Figure 45. Plan of of Sunrise Mine site, Advance Peak.

12. Discussion

This report and survey has covered the location, layout and nature of the main mining features around Macetown, between the Eight Mile Creek and Advance Peak. As it would be possible to produce a large report on any one of the main mines or the township itself, it must be appreciated that this is an overview of the local archaeology rather than a definitive account. The five main maps in this report locate the Macetown archaeological landscape with reasonable accuracy, and show the layout of that landscape and some of its inter-relationships. What the maps cannot do is show how steep and difficult much of the country is, and how much of a challenge it would have been to establish the mining operations. For example, the map of the Skytown area (off Sylvia Creek) in no way shows how the pylons for the aerial cableway are situated on virtually inaccessible spurs and bluffs on the side of a mountain.

Macetown itself is archaeologically very rich. As well as the sites of numerous dwellings, commercial premises and other buildings, there are also surviving elements of Victorian gardens, with daffodils blooming in the spring still confined to their original garden plots. Surrounding, and in places cutting through, the township are alluvial gold workings, a constant reminder of the reason for the township's existence.

The extensive alluvial workings along the hillside above the township contain some excellent examples of both ground sluicing and hydraulic sluicing and, even more importantly, a number of examples of the later technology replacing the older methods, with this progression readily visible in the archaeology.

The hard-rock mines in the valleys branching off the Rich Burn and up Advance Peak are good examples of remote underground mining systems, with mines, tramways, batteries and small settlements showing how miners in the valleys lived and worked. Some of the engineering works employed to link the mines with the batteries in the valley floors are extremely impressive. The All Nations cableway has to be viewed to be appreciated; the pylons marching into the mountains look completely inaccessible when viewed from below. Similarly, mines and huts nearly a mile high on Advance Peak illustrate the determination that was present to find gold at any cost.

Similarities in the technical details of some sites, such as the almost identical Homeward Bound and All Nations cableway structures, provide archaeological evidence of how many of the Macetown mines were run by only a few large companies by the end of the nineteenth and beginning of the twentieth centuries. The two cableways were built at the same time, to almost identical specifications, by the same company. Both only saw a few years' use.

13. References

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14. Glossary

- Adit:** A nearly horizontal excavation (tunnel) for access, drainage or ventilation of a mine (see drive, shaft, tunnel).
- Alluvial mining:** Alluvium is rock eroded and deposited by rivers and streams. It is usually unconsolidated or not lithified (i.e. composed of loose matter rather than solid or hard). Alluvial mining is, therefore, the mining of these deposits. Because they are generally relatively soft, water can often be used to mine them.
- Battery:** A name for a set of stampers or stamping mill. A mechanical device used to crush rocks so that the ore contained in them can be extracted (see mill, stamping battery).
- Berdan:** Large cast iron dish into which fine gravels (often crushed rock from the stampers or battery) are ground very finely prior to ore recovery. The dish has a slightly offset vertical axis which causes the dish to rotate on a slight angle to the horizontal. A steel weight in the dish (anchored by a chain) crushes the fine gravels as the dish rotates.
- Buddle:** A device for concentrating ore that uses a circular arrangement from which the finely crushed ore is delivered in water from a central point; the heavier particles (metal) sinking and the lighter particles (rock) over-flowing.

Concentrating table (Wilfley table): A device for separating gold from rock. It consists of a riffled deck to which a reciprocating motion in a horizontal direction is applied. The material to be separated is fed onto the table in a stream of water; the heavy particles (gold) collect between the riffles and are conveyed in the direction of the reciprocating motion, and the lighter particles (rock) are carried by the water over the riffles and discharged laterally from the table.

Crushing battery: See battery.

Cyanide tanks: Tanks used to contain cyanide and water solution. Finely crushed ore particles are added to the solution. The gold forms an amalgam with the cyanide. This amalgam is heavy and can be separated from the solution for further processing to extract the gold.

Drive: A horizontal or inclined excavation along or parallel to a lode, vein, reef or ore body (see adit, shaft, tunnel).

Ground sluicing: Washing gold-bearing earth through sluices provided with riffles and other gold-saving appliances. Also used to mean moving non gold-bearing earth (over-burden) by water to get to the gold-bearing material. In this case the material is washed away without going through the gold-saving appliances.

Hard rock, hard-rock mining/mines: Very hard rock which requires drilling and blasting to mine. Hard-rock mines commonly use tunnels, shafts etc. to gain access to underground minerals. Lodes, veins, reefs etc. are usually hard rock. These are often the source rocks for alluvial deposits.

Head: Can refer to either the pressure of a water supply (the vertical distance between the head of the pipes and the outlet); or a measured amount of water (the 'sluice-head', equal to 60 cubic feet per minute).

Hopper: (1) A funnel-shaped reservoir from which solid materials can be discharged into a receptacle below, especially for feeding a furnace, loading a truck etc. (2) An open-mouthed railway truck for loose minerals etc. unloaded through doors on the underside.

Hydraulic sluicing/mining: A method of mining in which a bank of gold-bearing earth or gravel is washed away by a powerful jet of water and flows through sluices, where the heavier gold separates from the lighter earth. The sluices are provided with riffles and other gold-saving devices.

Lode/reef: A fissure in hard rock filled with mineral—usually applied to metalliferous deposits. Lodes/reefs are usually confined between definite boundaries and are usually limited in extent compared with the surrounding non-mineralised rock. The most common mineral of lodes/reefs is quartz, which may or may not contain gold and other metals and minerals, especially at the interface with schist. Gold, if present, may have a patchy distribution through the lode/reef. See vein.

Mill/milling: preparing the ore—particularly that mined from hard rock—for further processing to extract the gold. This usually involves fine grinding, then processing with various chemicals.

Mullock heap: Waste rock heap. Valueless rock that has been fractured and removed in order to gain access to ore, or in the process of extracting the ore.

Pelton wheel/turbine: An impulse water-turbine in which specially shaped buckets attached to the periphery of a wheel are struck by a jet or jets of water from one or more stationary nozzles. Requires a pressurised water supply.

Quartz-reef mining: Hard-rock mining of quartz reefs that contain gold. See hard rock, lode.

Reef/reefing companies: Companies set up to mine quartz reefs for gold.

Revetment/revetted: A facing or retaining wall made on a soil or rock embankment to prevent scour by weather or water; commonly made with rock or stones.

Shaft: A passage or excavation, usually vertical, leading from ground level into an underground excavation or mine for the purposes of ventilation, access etc. (see also tunnel, adit, drive).

Stone: Another (colloquial) term for the rock of a reef, lode or vein.

Tunnel: A long, narrow horizontal or nearly horizontal underground excavation, commonly (but not always) open to the atmosphere at both ends (see also adit, drive, shaft).

Stamping battery/mill: A machine for crushing hard ores or rocks. Consists essentially of a crushing member (gravity stamp) which is dropped on a die, the ore being crushed in water between the shoe (head) and the die. The stamp shoe/head is a heavy and nearly cylindrical cast-iron head fixed on the lower end of the stamp rod, shank or lifter to give weight in stamping the ore. The crushed ore can then be further processed to extract the gold. See mill/milling.

Vein: An occurrence of ore, usually disseminated through a gangue or veinstone (commonly quartz) and having a generally regular development in length, width and depth. See also lode/reef.

Water race: A narrow constructed channel for bringing water from elsewhere to a place where it is needed for some purpose such as irrigation, power generation or sluicing. A supply race takes water to the workings (often from a dam or swamp), a head race leads into the workings and a tailrace takes water and fine tailings away from the workings.



An aerial cableway pylon,
Homeward Bound
cableway
(see Section 7.9.1).
Photograph: P. Petchey.