



A Brief History of Mining at the Bendigo Historic Reserve

PETER BRISTOW

Historic
Resources Officer
Otago Conservancy
August 1997

Peter Bristow died
suddenly in 2003
while still working for
the conservancy.

All photos by Matthew Sole
unless otherwise credited.

Alluvial gold was discovered in Bendigo creek in the latter part of 1862 as a result of the rush to the Dunstan area in September 1862. By 1863 about 150 miners had pegged out claims along the creek. Some claims were rich and yielded 15-50 ounces a week (Parcell 1976:123). One of these alluvial miners, Thomas Logan, began to prospect on the lower slopes of Dunstan range; searching for the quartz reefs that gave rise to the gold in the creek. Logan found a clearly defined reef and was able to produce samples of quartz with gold clearly showing. But despite this he was unable to interest other miners in his discovery. Quartz mining required a lot of capital to be successful and the alluvial miners of Bendigo did not have the money required (Duff 1978:73).



Remains of Bendigo Gully Hotel, O'Donnell's store and butchery which served miners for almost 40 years. Bendigo Creek Historic Reserve.



Department of Conservation
Te Papa Atawhai



Come in Time Stamper
Battery at Thomson's
Gorge.

It wasn't until 1865 when the mining surveyor Coates made an official report on the Bendigo quartz reefs that interest was taken in Logan's discovery. A group of wealthy Dunedin businessmen formed the Bendigo Quartz Mining Company and applied for a 16½ acre lease along Logan's reef. Two miners were employed to sink a shaft on the reef and by June 1866 half a ton of stone had been raised and sent to Dunedin for testing. The company had plans to erect a battery at the mouth of lower gorge of Bendigo creek (*Dunstan Times* 7/4/1866 & 29/6/1866). But no payable gold was found and the company became disillusioned and gave up the lease. It was then taken up by a syndicate of Logan, William Garrett and Brian Hebden. Because of the future success of the mine it is difficult to believe that no payable gold was found; it is assumed that Logan was unhappy with his treatment by the company and deliberately lost the gold bearing leader of the reef (Parcell 1976:126).

During 1866 alluvial mining at Bendigo was declining, the easily

won gold was gone and many of the miners had been drawn away to other fields, particularly the West Coast. There was still plenty of alluvial gold left but much of this was in the terraces above the creek and required water races to be brought in before they could be worked. Two mining parties cut significant races: the Rise and Shine party brought in a water race from Thomson's Creek, on the south side of the range, to the Rise and Shine Creek and the Aurora Company (Edward Barnes and party) brought in a 10 mile long water race from Devils Creek (*Dunstan Times* 6/1/1866). The Aurora race was completed in mid 1867 and sluicing of the Bendigo terraces started.

But it was 1868 before Logan & Co., were able to make real progress with their mine. In August they convinced George Wellington Goodger, a hotel keeper in Cromwell with experience from the California gold fields, to join them and put up money to purchase a stamper battery (Parcell 1976:127). The battery was from Hindon and consisted of 12 stamps and an iron water wheel. The battery was set up at the mouth of the Bendigo gorge; the same location that the Bendigo Co. had intended to use. The

cost of the battery relocation was £300 and money also had to be spent on forming a road from the mine site to the battery at the base of the hill (*Dunstan Times* 4/9/1868, 30/10/1868). The battery was operational by March 1869, although initially only 5 stamps were used, and the first crushing of quartz was in May 1869. Logan and co. were secretive about how much gold was obtained but rumours circulated that it was a good return. In July Logan and company (generally known as the Cromwell Company) were said to have sold gold worth £4-500 (*Dunstan Times* 7/5/1869, 21/5/1869 & 2/7/1869).



Cart and ruins at Logantown.

The success of Logan's mine spurred further prospecting for other reefs. The Aurora Company discovered a reef about $\frac{1}{4}$ of a mile lower down the range in Aurora creek and applied for an extended claim in May 1869. At this stage they had already sunk two shafts and had 8-10 tons of quartz ready to be crushed at the Cromwell Company battery (*Dunstan Times* 28/5/1869). The results of this crushing must have been promising as they purchased the battery of the defunct Criterion Co. on the Arrow river in July and were erecting it in Aurora creek by September. The company was in the enviable position of having a good water supply to drive the over shot water wheel for the battery because they owned the race out of Devils creek; for other companies at Bendigo obtaining a reliable water supply was to be a constant problem.

In the first week of November a third distinct reef was discovered in the creek below the Aurora reef by Charles Colclough of Cardrona. Rumours suggested that Colclough's reef was fantastically rich, as much as 100 ounces to the ton. Rumours such as this and the obvious success of the Cromwell Co, who were said to be averaging $2\frac{1}{2}$ ounces to the

ton caused a flurry of interest in the Bendigo reefs resulting in a rush to peg out prospecting claims. Several companies were formed around prospecting claims; 52 claims and 4 leases were supposedly being worked by December (*Cromwell Argus* 29/12/1869), and there was a great deal of speculation in the shares of these companies (in December a full share in the Aurora Company sold for £1050). So rife was this speculation in November 1869 that Vincent Pyke, the goldfields warden for Dunstan, placed a restriction on the transfer of shares in companies. This was designed to prevent parties taking up claims and then making money by selling shares rather than actually working the claim. However by the end of November much of the excitement had died down and Pyke lifted the restriction (*Dunstan Times* 5/11, 12/11, 19/11, 26/11/1869, *Cromwell Argus* 29/12/1869).

To reach Bendigo in December 1869 the hopeful miner had to walk, ride or drive from Cromwell via Lowburn. In June 1870 a once a week (Wednesdays) carriage service was started by James Lawrence (*Cromwell Argus* 22/6/1870). The fare was 12s6d for a round trip or 7s6d one way. From Lowburn the west bank of the Clutha was followed until the punt or ferry across the river at Rocky Point was reached. At the height of the rush to Bendigo there were two punts; that operated by John McCormick charged sixpence for foot traffic and 1/6d for those on horse back (the ferry was made free in 1878). This was the only way over the river until a bridge was built at Rocky Point in 1878 (unfortunately soon after the bridge opened a large flood came down the Clutha and changed the course of the river leaving the bridge high and dry).

The next small settlement was around the Cromwell Company battery at the foot of the range. Here, in addition to the battery, was William Goodall's Bendigo Reef Hotel and Mitchinson's and Harrison's General Store. There were also four small huts that belonged to men who worked in the battery. This is the location that eventually became known as Bendigo. There was a further hotel and store (W.G. Smith and Charles O'Donnell) about 1.5 km further east at Bendigo Gully. This was the heart of the old alluvial diggings. It should be noted that there was some confusion in the newspapers of the time over the names of the settlements around the mines; Wakefield and Bendigo are both used for the settlement by the battery and Bendigo often is used when Logantown is being referred to.

At the battery the road climbed up the hill to the Cromwell Company mine. By December 1869 a thriving town had built up on an area of flat ground midway between Logan's and Colclough's reefs. This became known as Logantown. The first business erected on the site was James Beare's store; by early December other stores had been built by W. Stanley, J. Perriam and J. Thormahlen. Hotels had been built by G. Bond, J. Patterson (Old Bendigo Family Hotel) and T. Russell. William Jackson Barry and C. Williams had opened butchers shops and Stevenson of Clyde a bakery. There was also Isaac's Clothiers and Lindsay the blacksmith. Thomas Logan, the discoverer of the field, had his residence here (*Cromwell Argus* 1/12/1869). In addition there were several miner's tents. By mid December a further hotel (Horrigan's) had opened as

well as Hamilton and Barclays billiard saloon and Mercer's "Temperance Restaurant" (*Cromwell Argus* 15/12/1869). A fifth hotel (The Reefers Arms) was opened by Beare in January 1871 and was said to be the largest in the district. Perriam opened a sixth hotel (The Provincial) at the same time (*Cromwell Argus* 26/1/1870). A seventh (The Aurora) was opened by April (*Dunstan Times* 8/4/1870).

Having this many hotels in an area lead, almost inevitably, to complaints about "rowdyism". By the end of February 1870 there were calls for a policeman to be stationed locally (*Dunstan Times* 25/2/1870). Oddly, the correspondent put the problem down to the lack of single women whose presence would have a moderating influence. In response Sergeant Cassells of Cromwell made occasional visits to Logantown. Those who had complained about the rowdyism were soon complaining about Cassells over zealous nature. During March he broke up a dance at the Provincial Hotel, demanding that the music cease. The party goers however ignored the good sergeant and merely moved the party out into the street (*Dunstan Times* 18/3/1870). The following month the *Dunstan Times* correspondent was still complaining about Cassells stopping "entertainment" at the hotels (*Dunstan Times* 8/4/1870).

The "Reefer's Arms" was probably typical of many of these buildings; when offered for sale in May 1871 (*Dunstan Times*) it was described as having a 35 foot frontage on the main (and probably only) street and included a dining room, parlour, large kitchen and ten bedrooms. The whole being built of corrugated iron and American timber. Also included in the sale were out buildings and a stable. The location of Logantown wasn't ideal, there was limited water and no fuel. The nearest source of coal was Bannockburn where it cost (in 1878) 10-12 shillings a ton but at Bendigo it cost £3 10s a ton, most of this cost being transport (*Cromwell Argus* 27/8/78). There was also no timber close at hand to use as timbering and props inside the mine shafts and tunnels. The Hawea Saw Mills would supply timber to Bendigo, in any quantity, at the cost of 16 shillings per 100 foot (*Cromwell Argus* 20/4/1870). The mines were prodigious consumers of timber, in October 1875 20000 feet of timber was carted to the Eureka Mine, a small mine in Rise and Shine Creek (*Cromwell Argus* 20/10/1875).

Shaft at Alta mining area.



During this period of speculation other reefs were discovered. In November the Alta reef was discovered by Samuel Williams, a quartz miner from Victoria (*Dunstan Times* 17/12/1869). The reef was situated on the ridge line between Bendigo creek and Rise and Shine creek about 3.5 km east of Logantown. Williams played little part in the subsequent development of the mine but moved to the Carrick range and was a principal share holder in the

Young Australian Co. At the end of November a sixth reef (Richmond's) was discovered on the range below Colclough's. Then in March 1870 a further reef (Broadfoot's) was found between Colclough's and Richmond's. In mid 1870 Richmond's reef was sold to the Iguana Co. which has led, somewhat unfortunately, to the reef becoming known as the "Guano" in most histories of the area (*Cromwell Argus* 16/3, 22/3, 18/70, *Dunstan Times* 3/12/1869, 26/8/1870).



View from Alta mining site, across Bendigo Scenic & Historic Reserve through to the Pisa range.

Despite the discovery of these reefs most of the mining parties that took up claims at Bendigo at this time were prospecting on the lines of the known reefs. Most references are to parties working on the lines of the Aurora and Logan's reefs. In such cases the miners had pegged out a claim (often referred to as, for example No. 2 East of Logan's) along the supposed line of the reef in the assumption that, while not visible on the surface, the reefs continued across country on a consistent line and that sinking a shaft or putting in a tunnel would hit the reef.

The sinking of shafts or tunnels (often referred to as drives or adits) was specialised work requiring quite different skills from alluvial mining. Since most of the share holders in the early companies prospecting or mining at Bendigo were either alluvial miners or local and Dunedin businessmen, a labour force of hard rock miners was required. Some of the companies, presumably those with large amounts of working capital or paying claims, employed a permanent work force. The Cromwell Company, by the end of 1869, employed 30 men (*Dunstan Times* 17/12/1869). Companies which couldn't afford a permanent labour force or were only prospecting



Deep head - Bendigo Creek.

on reef lines often let tenders for the sinking of shafts or the driving of tunnels. The contractors would be paid per foot of shaft or tunnel. One tender called for the driving of a tunnel 300 feet long, 6 feet high and 3 foot 6 inches wide (*Dunstan Times* 25/11/1870). The rates varied but in the early 1870s £1 to £2 per foot were paid. For those miners who were part of a permanent work force the average work day in 1870 was 10 hours long for which they were paid £4 a week (*Dunstan Times* 10/6/1870). In March 1871 this was reduced to £3.10s a week (or £3 for those on only an 8 hour day), a strike was threatened but most miners accepted the cut (*Dunstan Times* 31/3/1871). Even if miners were part of a permanent work force there was little job security, if there was little or no work to be done then the miners would be paid off. This often happened during the winter when the severe frosts of the area would halt operations by freezing up the water supply for the battery. A third system of labour was used if a company felt that they could not work the claim

profitably. In such cases the claim would be let on tribute. The company would call for tenders from parties of miners to work the mine and pay a percentage of any gold obtained to the company. Around 15% seem to have been the usual rate of tribute.

The heyday of Logantown as a commercial centre was remarkably brief. By April 1871 (*Dunstan Times* 14/4/1871) the newspaper correspondent noted that there were too many stores in Logantown to be profitable despite there being no lack of people. The discovery of the quartz reefs on the Carrick range and the rise of the settlements of Quartzville and Carricktown resulted in most of the businesses moving to the Carrick range. The *Dunstan Times* (22/9/1871) noted that the Bendigo Gully township (probably Logantown as there never was a township around the hotel and store in Bendigo Gully) was almost a thing of the past.

It persisted as a much smaller settlement through the remainder of the 1870s. In 1878 (*Dunstan Times* 8/3/1878) Logantown was reported to consist of an hotel, a butchery and a few huts. These businesses were William Cameron's Logantown Hotel and Oates' Butchery (which was

offered for sale complete with sausage machine in August 1880). Cameron was granted a liquor and billiards license in 1875 (*Cromwell Argus* 23/6/1875). However in 1878 a correspondent for the *Dunstan Times* (8/3/1878) described it as a boarding house. Possibly the liquor license was held for a brief period of time; when it burned down on the 21st of July 1880 it was said to be a 12 roomed house and billiard saloon (*Cromwell Argus* 27/7/1880). Ironically it burnt down because of the expense of coal. Instead of coal, bunches of dried spear grass were used as fuel. The fire started when embers from the stove ignited a heap of spear grass lying next to the stove. Cameron was also unfortunate enough to fall down one of the numerous mine shafts in the area. In October 1878 he was returning to Logantown from O'Donnell's one evening when his lamp blew out and he lost his way. Falling down a 70 foot mine shaft he was knocked unconscious and broke his collar bone. He was found by two boys the next day and rescued (*Cromwell Argus* 29/8/1878).



Welshtown miners cottage remains.

Further up the hill from Logantown was the settlement of Welshtown. By 1875 it had overtaken Logantown as the main population centre. The houses, gardens, huts and stables are clearly marked as a cluster of buildings at the eastern end of the Cromwell Company's mining lease on Alexander MacKay's November 1876 map of the Bendigo Reefs. The several stables on the map reflect the importance of horses to the mining industry at this time. Not only were they necessary to cart the ore from the mines to the batteries but were also used to power the primitive winding gear used in the mine shafts. In 1878 the *Dunstan Times* correspondent described Welshtown as a few neat little iron cottages of resident miners and a small iron building used as a church.

This corrugated iron and baltic timber structure had been built at a cost of £100 at the beginning of 1876. Although only 20 feet by 14 feet the building was intended to be used as a meeting house and for the occasional church service (*Cromwell Argus* 29/2/1876). One of the main users was the Bendigo chapter of the Good Templar's Lodge. The Good Templar's were a popular lodge during the 1870s on the Otago gold fields, their main tenet was complete abstinence from alcohol. The Bendigo lodge started in 1875 and had about 30 members who were mainly Welsh, presumably the miners of Welshtown (*Cromwell Argus* 21/7/1875). However by July 1878 Good Templarism was said to be in decline at Bendigo because of the decline in population and the "migratory inclinations" of the mining

community (*Cromwell Argus* 30/7/1878).

The little meeting house also served briefly as the first school in 1879–80 until the official school opened. This was lower down the hills on the terrace above the Bendigo town site where it was midway between the mining settlements and Bendigo and the surrounding farms. The site was chosen in August 1880 and the school opened in 1881 (*Cromwell Argus* 26/3/1878, 10/2/1880, 10/8/1880, Duff 1978:132-133).

With the decline of Logantown as the business centre most of the remaining businesses in the area were at Bendigo (apart from O'Donnell's Bendigo Gully hotel and store). At the end of 1869 there was only Goodall's Bendigo Reefs Hotel and Mitchinson and Harrison's General Store. But gradually other businesses were added. Neil Peyton opened the Solway Hotel in October 1870 (*Cromwell Argus* 12/10/1870). Peyton soon sold it and it was operated for several years by W.G. Smith who had been in partnership with O'Donnell. Goodall's hotel burnt down in 1872 but was rebuilt as a 10 roomed building. At the same time a bakers and butchers were added to what was called a "flourishing township" and Mitchinson's store also functioned as the post office (*Cromwell Argus* 18/6/, 3/9/1872). Mitchinson's store seems to have been the main business in the area, and when it was offered for sale in August 1876 it was said to be doing the bulk of the business at Bendigo. By then it comprised a store, dwelling and butchery (ibid. 15/8/1876).

In August 1878 the Bendigo correspondent in the *Cromwell Argus* (27/8/1878) gave the population of the Wakefield, Logantown and Welshtown as 500. However according to the census of that year the population of the area was: Bendigo Reefs (50 males and 29 females) and

Looking north from
Welshtown to Lindis Peak.



Wakefield (19 males and 17 females). By this time the entire population was said to be directly or indirectly dependent on the Cromwell Company mine (*Cromwell Argus* 26/3/1878). The census of 1881 gave Logantown a population of 14 males and 11 females, Welshtown 57 males and 20 females and Bendigo Gully 7 males and 1 female.

During the late 1870s there was a big enough population in the Bendigo area to hold an annual sports day at the end of the year. Christmas—New Year seems to have been the main holiday for the mine workers. The sports day in 1876 was held on the 31st December 1875 and 1st January 1876. A whole host of events were held, in addition to horse and foot races there were: quoits (£1.10 first prize), Cumberland wrestling (£2 first prize), hop, step and jump, sack race (£1 first prize), 3 legged race (£1.10 first prize), pole vaulting, high jump, standing flat jump, collar and elbow wrestling, putting the stone, and Cornish wrestling (*Cromwell Argus* 15/12/1875).

The fortunes of Bendigo, Logantown and Welshtown rose and fell with those of the mines. Despite the large number of claims that were taken up during 1869-70 only three companies lasted any length of time. These were the Cromwell Company, the Aurora Company and the Lucknow (or Colclough's) Company. These latter two companies had chequered careers.

THE AURORA COMPANY

The Aurora Company was originally the Aurora Water Race Co. and was formed to construct a water race from Devils creek with the intention of bringing water to sluice the terraces above Bendigo creek. The race was cut during 1866 and opened by April 1867 (*Dunstan Times* 6/1/1866, 26/4/1867). In May 1869 the Aurora Company (Barnes, Gerrard and party) were reported to have found a reef near Logan's. By the end of the month they had sunk two shafts and 8-10 tons of stone were ready for crushing at the Cromwell Company battery (*Dunstan Times* 28/5/1869).

The results of this initial crushing must have been promising as the company bought the battery of the Criterion Co from the Arrow river in August (*Dunstan Times* 6/8/1869). This was only of 5 stamps, a further 5 stamps were supplied by Kincaid and McQueen of Dunedin (*Cromwell Argus* 9/2/1870). The battery was officially christened on the 4th of February 1870 by Mrs Perriam (wife of one of the principal share holders), this was followed by a ball at Perriam's Provincial Hotel. Initially only 5 stamps were erected but the other stamps were soon added, the power was provided by a 26foot 6inch over shot water wheel built of kauri (*Cromwell Argus, Dunstan Times* 17/12/1869). The water came from the company's Devils creek race, from which they had the right to take 12 heads of water (*Cromwell Argus* 20/4/1870).

The first wash up at the battery was encouraging, 3 ounces of gold to the ton being reported (*Dunstan Times* 25/2/1870). However these early returns proved to be the exception rather than the rule. The battery was soon opened for public crushing (*Cromwell Argus* 13/4/1870), that is

crushing stone for those companies that did not have their own battery (at this stage only the Aurora Company and the Cromwell Company had batteries). The charges for crushing were on a sliding scale:

10 ton or less	£2.00 per ton
10-20 tons	£1.15 per ton
20-50 tons	£1.10 per ton
50-100 tons	£1.05 per ton
50-100 tons	£1.05 per ton

These charges must have been too high for many of the companies as they were lowered in August to 16 shillings per ton for over 100 tons, 20 shillings (or £1) for 50-100 tons and 25 shillings for less than 50 tons (*Dunstan Times* 19/8/1870). It is clear from the newspaper accounts that the 10 stamps were operated as two separate 5 stamp batteries, each set of five stamps having their own ore feeders and saving tables. This enabled stone (or ore) from two different mines to be crushed at the same time (*Dunstan Times* 13/5/1870, 10/6/1870).

These first public crushings also indicated the great variability in the richness of the various reefs (apart from Logan's reef). Stone crushed for Loughnan and Co., only produced 16 dwts (pennyweights) per ton, less than an ounce, while the crushing for Colclough's yielded about 3 ounces to the ton. This was such a large variation that many, perhaps hoping that their claims would be as rich as the Cromwell Company's, were inclined to believe that, somehow, the battery or its operation was at fault (*Dunstan Times* 29/4/1870).

Perhaps to improve the performance of the battery, tailings amalgamating equipment was installed in May 1870. The first use of the equipment yielded a return of 7 grains of gold for every ton of ore put through the battery (*Dunstan Times* 27/5, 22/7/1870) gold. Gold is weighed in troy ounces which are slightly heavier (31.1 grams vs. 28.3 grams) than the normal, or avoirdupois, ounce. There are 24 grains in a pennyweight and 20 pennyweights to the troy ounce.

In June the company put in a tramline from their 75 foot deep mine shaft to the battery. The ore being mined at that time was yielding about 13 dwts to the ton although some richer patches were encountered (*Dunstan Times* 24/6/1870). Returns did not improve, the gold obtained only just covered the expenses of mining it. Therefore at the end of October 1870 the company discharged the miners and worked the claim themselves (*Cromwell Argus* 2/11/1870).

This, too, was not a success and in February 1871 the decision was made to let the mine on tribute, although it wasn't until April that agreement was reached with a party of miners (*Dunstan Times* 13/2, 28/4/1871). However the tributers can't have thought much of the prospects of the mine as in August they had suspended work on the mine and were cutting a race and putting a large flume over Bendigo creek to sluice the terraces between the creek and the Lindis river. This work was completed in September and sluicing commenced in October (*Cromwell Argus* 18/8, 29/9/1871).

By May 1872 only two men were working the mine on tribute. The

main tunnel was in 100 feet at this stage and a 4-5 feet wide reef was exposed but the returns were still poor. The wash up in June only yielded 17 ounces from 60 - 70 tons (*Cromwell Argus* 14/5, 18/6/1872). This was followed by another poor result early in August. However soon after a potentially rich leader was found with gold visible in the rock. This prompted the company to advertise an application for a 16 acre mining lease for a period of 15 years. The advertisement also stated that the company intended investing £7000 in the mine (*Cromwell Argus* 6/8, 27/8, 3/9/1872).

The next wash up of the tributers reflected this better stone, 29 ounces from 36 tons (*Cromwell Argus* 1/10/1872). However this was still not enough to make the mine payable and the mine was still being worked on tribute throughout 1873. The wash up in September 1873 was still less than an ounce per ton, only 123 ounces of gold from 131 tons (*Dunstan Times* 19/9/1873). The company held several meetings to decide upon winding up the company but no final decision seems to have been made until 1874. The mining plant was offered for sale by auction in September 1874. The advertisement in the *Dunstan Times* (4/9/1874) gave details of the equipment offered; 2 batteries 5 stamps each, copper plates and riffle tables, amalgamating barrels, a water wheel and a blacksmiths shop. The water race and water rights were also to be sold. The company itself was sold in December (ibid. 4/12/1874).

The demise of the Aurora Company coincided with a renewal of interest in the Bendigo area and 1875 saw an upsurge of activity. A new reef line was found near Logan's reef and several new companies were formed to work the new reef and the existing ones. An attempt was made to float a new company, the New Aurora Quartz Mining Company, in March 1875 (*Dunstan Times* 19/3/1875). The promoters of the new company made much of the fact that the mine had always paid expenses and they believed that the failure of the mine to be profitable was due to the main tunnel being too high. They intended to sink an existing shaft in the tunnel to a depth of 2-300 feet. However, the new company never eventuated and all operations at the mine ceased.

The battery and plant were purchased by the Cromwell Company who continued to operate it as a public battery, crushing stone for other companies. In June 1876 the *Cromwell Argus* reported that the Cromwell Company intended to shift the Aurora battery to their claim as they were raising more stone than they could crush with just one battery (*Cromwell Argus* 8/6/1876). But the battery continued to be operated throughout 1876 and 1877 on its original site and it wasn't until the beginning of 1878 that the battery was shifted up to the Cromwell Company's main shaft where it formed part of the new Matilda battery (*Cromwell Argus* 26/3/1878).

THE LUCKNOW COMPANY

Colclough's reef was discovered during the first week of November 1869 by Charles Colclough of Cardrona (*Dunstan Times* 5/11/1869). He was one of a small number of miners from the Cardrona area who had joined together to prospect the area (*Cromwell Argus* 12/1/1870). Soon after the discovery rumours were circulating that the reef was fantastically rich, yielding as much as 100 ounces to the ton (*Dunstan Times* 12/11/1869). The reality was that the first crushings from Colclough's reef at the Aurora battery were between 2½ to 3 ounces to the ton (*Dunstan Times* 29/4, 6/5/1870).

These returns were sufficiently encouraging for the company to purchase a stamper battery from Macraes Flat (*ibid.* 13/5/1870). During July the Colclough Quartz Reef Mining Company was formed with a nominal capital of £8400 in 48 shares of £175 each. There were 17 shareholders of which the majority were Dunedin businessmen, Colclough held eight shares (*Dunstan Times* 15/7/1870). The next few months were spent preparing the site for the battery and building a tram line from the mine to the battery site. The company must have been confident of the mine's success because gold was reported to be visible in every piece of stone (*Dunstan Times* 22/7, 12/8, 19/8/1870).

The battery was erected during December 1870. The power was supplied by a turbine wheel driven by the tail water from the Aurora battery (*Dunstan Times* 19/8/1870, 13/2/1871). The first few crushings were disappointing for the company. During April 1871 (*Dunstan Times* 28/4/1871) the battery was returning 16 dwts to the ton. This may have been a little above average as in September it was reported that only 50 ounces was obtained from 120 tons, about 8 dwts to the ton (*Dunstan Times* 1/9/1871).

Despite these poor returns the company persevered with the mine. During May 1872 they were still busily crushing and they must have believed things were about to improve as they had employed additional hands and had a night shift at work (*Cromwell Argus* 14/5/1872). However the gold returns continued to be poor; only 55 ounces from 108 tons (*Cromwell Argus* 23/7/1872) The main shaft was down to depths where water was becoming a problem (*Cromwell Argus* 4/6/1872). During September the company met in Dunedin to decide the future of the mine. Offers had already been made to work the mine on tribute but the decision was made to sell (*Cromwell Argus* 3/9, 17/9, 24/9/1872).

The Colclough Quartz Reefing Co., and battery was sold at auction in October for £720. The purchasers were a new company of 12 share holders who applied for registration in November as the Lucknow Quartz Reef Mining Company. The company had a paid up capital of £1300 and nominal capital of £7800. Charles Colclough held 200 shares in the new company (*Cromwell Argus* 15/10, 5/11/1872). Colclough was also involved with mining on the Carrick range as well as being an auctioneer, mining agent. In addition he also served as Cromwell town clerk and mayor.

The new company let a tender to drive a tunnel 400 feet at £2 a foot. The tunnel was in 160 feet by April 1873 and in September there was

only 19 feet to go (*Dunstan Times* 4/4, 19/9/1873). By December only 2 or 3 hands were at work but piping had been installed to improve ventilation (*Dunstan Times* 5/12/1873). Mining continued without any indication of success until September 1874 when it was reported that the Lucknow Co. had struck a rich reef and had secured the mouth of the tunnel with a strong door (*Dunstan Times* 4/9/1874). In response to this find, more men were employed and operations changed from two shifts of two men to three shifts of six men including a night shift (*Dunstan Times* 2/10/1874). However this optimism was misplaced as next month the company was reported to be still driving without success (*Dunstan Times* 6/11/1874).

During January 1875 the Bendigo reefs were visited by Professor Ulrich of the Victoria (Australia) School of Mines. He was critical of most of the mines (except the Cromwell Company). In the case of the Lucknow mine his criticism was that they had left the main reef to follow a 'straggler'. At the same time Mr. Besanko, the mine manager, was stating that they had struck good stone after 2½ years of mining. Ulrich dismissed this as "a mere blow off the reef" (*Dunstan Times* 15/1, 22/1/1875). Again, in April it was reported that good stone had been found (*Dunstan Times* 23/4/1875). This find was also reported by Warden Simpson. According to Simpson the reef was found at the end of their 500 to 600 foot tunnel (Appendices to Journals of the House of Representatives [AJHR] 1875 H3:22). But in June the company was reported as still plugging away which seems to confirm Ulrich's assessment of the mine (*Cromwell Argus* 16/6/1875).

Little more is recorded in the newspapers of the operations of the Lucknow Company. The battery was overhauled in July 1875 and in February 1877 the mine was let on tribute to Charlton and party (*Cromwell Argus* 28/7/1875, 27/2/1877). In May 1877 the tributers were reported to have found a new reef of considerable value and were said to be forming a limited company to exploit their find. This new find is reflected in the crushing return for September, 37 ounces from 30 tons (*Cromwell Argus* 29/5, 18/9/1877). The tributers formed the Try Again Co. to exploit their find (ibid. 2/10/1877). But this too came to nothing as in March 1878 the Lucknow tributers were reported to have stopped work because the mine was not paying wages (*Cromwell Argus* 26/3/1878). In December 1885 tenders were called to shift the Lucknow battery to White's reef on the Old Man range (*Cromwell Argus* 1/12/1885).

THE CROMWELL COMPANY

Ultimately, of all the mining claims and leases that were taken up at Bendigo only that of the Cromwell Company was profitable. As previously noted the Cromwell Company consisted of Thomas Logan, William Garrett, Brian Hebden and George Goodger. The company's battery at Bendigo started crushing in March 1869 and it was the success of these first crushings that spurred the rush to the Bendigo reefs.

Despite the early success of the company (or perhaps because of this

success) there was a falling out between Garrett and the other partners. In December, Garrett petitioned warden Pyke asking for the dissolution of the company. But before the petition could be heard Garrett was killed in a riding accident on the evening of the 30th of December, 1869. While riding between Cromwell and Lowburn his horse shied and Garrett was thrown off, fracturing his neck (*Dunstan Times* 31/12/1869, *Cromwell Argus* 5/1/1870). Garrett's shares were acquired by the other three partners.



Remains of Welshtown
miner's cottage.

During March 1870 the Cromwell Company came into conflict with a party of alluvial miners in Bendigo creek. Not only was water from the creek used to power the over shot water wheel, but required to carry the finely crushed ore across the gold saving tables. The alluvial miners (Alldridge and party) had bought out a group of Chinese miners and arranged to use the tail water from the Aurora Company for sluicing. However after sluicing there was too much sediment in the water for it to be used in the battery. The battery suspended work for a time while the company took legal action against the sluicers. An injunction against the sluicers was granted at the end of March and Alldridge and party were eventually forced to cease discharging unclean water (*Dunstan Times* 11/3, 8/4, 10/6/1870, *Cromwell Argus* 9/3, 30/3/1870).

Soon after the water supply problem the battery ceased work again because a 3 inch nut fell into the cogs of the driving and pinion wheels of the battery, breaking both (*Cromwell Argus* 11/5/1870). While the battery was out of action the company's ore was crushed by the Aurora battery and the time was spent erecting the second set of 5 stamps at the battery (*Dunstan Times* 13/5, 27/5/70). The battery started crushing again at the end of July and by mid August 80 tons had been crushed for 300 ounces (*Dunstan Times* 22/7, 12/8/70). Production at the mine was such that almost all the available horses in the area were being used

to cart ore from the mine to the battery (ibid. 9/9/70).

During the early years of the mine gold values per ton of ore varied from a low of 1½ ounces to a high, in March 1874 (*Cromwell Argus* 27/3/74), of 6.6 ounces per ton with perhaps 2-3 ounces being the average return (gold at this time was worth £3.15 an ounce). This is in striking contrast to the other mines which were struggling to pay more than the expenses of extraction of the ore and seldom got more than an ounce of gold to the ton.

In August 1872 Brian Hebden sold his interest in the company to Borthwick Baird and returned to England (*Cromwell Argus* 27/8/1872). The mine continued to produce healthy returns through the next few years. For the first 6 months of 1875 Logan, Goodger and Baird were said to have made £16,000 (*Cromwell Argus* 16/6/75). Later in 1875 Thomas Logan was reported to have sold two thirds of his shares for £10,000 (*Cromwell Argus* 29/9/1875). January 1876 saw a major reorganisation of the company. The Cromwell Quartz Mining Company was registered as a public company with 12,800 shares of £6 each. The major shareholders were Baird and Goodger who had 4000 each; Logan retained 1200. The remaining shareholders were Dunedin businessmen who held 1000 shares or less each (*Cromwell Argus* 26/1/1876).

The restructuring of the company was followed by a major reorganisation of the mining operation. In February 1877 the company decided to shift the 10 stamp Aurora battery, which had been sold by the defunct Aurora Company in 1874, to a site adjacent to the main shaft where it would be powered by a turbine (*Cromwell Argus* 13/2/1877). However the battery wasn't shifted until early in the following year. In March 1878 it was reported that the Aurora battery had been shifted to near the main shaft and two turbines installed for winding and pumping. At this stage no roof had been erected over the battery but two houses had been built nearby, one as the office and residence of the mill manager and the other as a storeroom. At the same time Charles Todd was appointed as the new manager (*Cromwell Argus* 26/3, 16/4/1878).

In June 1878 the decision was made to erect a further battery which was to be run by steam power when water was not available (*Cromwell Argus* 4/6/1878). This seems to have been 5 stamps from the original Cromwell Company battery as the company advertised another 5 stamp battery and a 30 foot overshot water wheel for sale in March 1880 (*Cromwell Argus* 9/3/80). A building for the battery was erected during August and the new machinery was set in motion on December 2 (*Cromwell Argus* 13/8, 3/12/1878).

In the first four months of 1879 the new battery recovered 2476 ounces of gold (*Dunstan Times* 25/4/1879). The company's 6 monthly report (*Dunstan Times* 18/7/1878) gave returns of 4088 ounces of gold from 2893 tons, an average of one ounce eight penny weights to the ton. Dividends of £6400 were paid to shareholders (10 shillings per share). The battery was described as being of 15 stamps (to be increased to 20 stamps) driven by a Leffels 10 inch double action turbine. Power was also available from a 12 horse power steam engine which also provided hot water for the quick silver tables. Three shafts were being worked:

211 feet, 330 feet and 337 feet deep with this last shaft to go down to 400 feet.

While the company was still able to pay a reasonable dividend the average return of less than 1½ ounces to the ton was a significant decline in the gold values when compared to the earlier years of the operation. For the remainder of the mines operation, gold returns significantly above one ounce to the ton became the exception. The company report for the last 6 months of 1880 (*Cromwell Argus* 8/1/1880) reflects these declining returns, only 4008 ounces were obtained from 4073 tons (an average of slightly less than one ounce to the ton). Yet, despite the fall in gold production, dividends of £8000 were paid. The company also instituted an accident fund for workers with 6 pence a week deducted from their wages.

With the expansion of the company's operation there had been a similar increase in the work force with about 70 men being employed at the beginning of 1880. But at this time the falling gold returns began to affect operations. In March the Bendigo correspondent of the *Cromwell Argus* reported that the company intended to raise less stone and concentrate on milling selected stone thereby hoping to maintain the same level of returns and reducing production costs. As part of this new reorganisation 40 men were laid off. The correspondent believed that these changes were prompted by the non payment of a dividend to the shareholders (*Cromwell Argus* 23/3/1880).

Jackson Keddell, the goldfields warden at Clyde, however interpreted the reorganisation as being due to the company not carrying out preparatory work in parts of the mine at the same time as taking out payable stone

View along Kanuka walk up
into Chinaman's Creek.
Pisa range to the right in
the distance.



in another (*AJHR* 1880 H6:28). Keddell's comments are borne out by subsequent newspaper reports which state that the company was putting in a lot of dead work putting in drives to cut the leader (*Cromwell Argus* 12/7/1880). At the same time the gold returns were falling, to a low of $\frac{3}{4}$ of an ounce per ton in December for 4 weeks crushing (*Cromwell Argus* 30/12/1880).

The failure to find stone with higher gold values led to the company attempting to cut production costs further by reducing the miners' wages from 10 shillings a day. The miners went out on a general strike in June 1881. By the following month relations between the company and the miners had become bitter and trespass notices were issued by the manager on all miners who had dwellings built upon the company's mining lease. Failure to remove a dwelling would result in a charge of 10 shillings a week for the first two weeks and 15 shillings a week thereafter (*Dunstan Times* 15/7/1881). Many miners chose to remove their houses or huts than pay a rent that equated to more than a day's wages. The strike ended in August when the company agreed to retain the 10 shillings a day wage for miners working at the mine face but other workers were forced to accept a cut to 9 shillings a day. While the strike was resolved it left a legacy of ill feeling between the company and its workers. Todd, the manager, actually received a pay increase of 10 shillings (*Dunstan Times* 26/7, 16/9/1881).

In addition to the declining labour relations the mine production continued to fall. The last 2 months of 1881 only produced 202 ounces. Perhaps because of this poor performance a further 8 men were laid off (mainly strikers). The company was only able to declare a dividend of £320 for the previous 6 months (*Dunstan Times* 13/1/1882). The company persevered for another 2 years but gold production continued to be poor, the company eventually made the decision to wind up in September 1884 (*Cromwell Argus* 30/9/1884).

A new company, the New Cromwell Quartz Mining Company, was formed at the end of 1884 (*Cromwell Argus* 16/12/1884). Rather than continue the operations of the old company the New Cromwell Company decided to sink a new shaft on the North Lode, a second reef which ran parallel with the original or Logan's reef. The company expended considerable capital in sinking this shaft, there were 2 winding compartments each 5 feet by 3 feet 2 inches and a pumping shaft 5 feet square. The winding gear was powered by a turbine wheel, a contrast from the old days when the winding was done by a horse-powered whim. The company also used, for the first time at Bendigo, compressed air rock drills (prior to this all the rock drilling had been done by hand). The air compressor for these drills was also powered by a turbine (*AJHR* 1886 C4:18, *Otago Witness* 21/2/1889). The battery consisted of 20 stamps driven by a Whitelaws turbine and quicksilver and blanket tables.

By the end of 1886 the new shaft was down to 280 feet. As this was below the level of the old shaft the inflow of water became a serious problem. After nearly 2 years of sinking no crushing had been done but in November berdans (tailings amalgamators) were set up and the battery was prepared to start crushing (*Otago Witness* 5/11/1886). But despite

the expenditure of at least £6000 the crushings were too poor to allow the company to continue and in August 1887 further capital was sought in London (*Otago Witness* 5/8/1887).

By the end of 1889 the new shaft was down to a depth of 395 feet and 27 men were employed by the company. While they were engaged in sinking the shaft the company also carried out exploratory work on other parts of their lease. At this time the special claim was 200 acres in area and included most of the known reefs in the vicinity of the mine (*Otago Witness* 11/4/1889). The only crushing that was carried out was on stone that was raised from leaders in the old workings but these were generally thin and didn't produce large amounts of payable stone (*Otago Witness* 3/10, 10/10/1889).



Remains of Come in Time
battery, 2005

By the beginning of 1891 the shaft had reached a depth of 520 feet. The company then drove a cross cut into the hill with the hope of intercepting payable leaders (*Otago Witness* 9/4/1891). But by the end of the year all work ceased on the new shaft and the only crushing being done was on stone taken out of the 150 foot level in the old workings which was giving about an ounce to the ton. These were blocks of stone that had been left by the original company during the 1870s. Despite the failure to find payable stone in the new shaft it was proposed to seek more capital in London to sink the shaft another 200 feet in the hope that things would improve at that level (*Otago Witness* 12/11/1891). By May 1892 all hands were laid off, except for 2 who were kept on to maintain the machinery and keep the pumps operating, while more capital was sought (*Otago Witness* 19/5/1892).

At the same time the mine manager went to England to report to the shareholders on the future prospects of the mine with a view to raising more capital. He also took with him samples of the ore from the 520 foot level. When assayed this proved to contain between 1oz 5dwts and 1 oz 12 dwts to the ton. But the ore contained high levels of sulphides which made extraction of the gold difficult using the techniques then available at Bendigo. It was hoped to treat this ore with the latest techniques in England to see if the gold could be profitably extracted (*Otago Witness* 4/8/1892). The shareholders seemed to feel the further prospects of the mine were favourable because they undertook to raise further capital (*Otago Witness* 8/9/1892).

Work on the mine started again in 1893 but no further work seems to have been carried out on the shaft. When Henry Gordon, the government mining engineer, visited the site the only work being carried out was in the upper levels of the workings. Gordon believed that there was little likelihood of payable quartz being found in the deep shaft (AJHR 1894 C3:81). The company must have come to the same conclusion as in May 1894 the mine was closed (*Dunstan Times* 25/5/1894).

The mine was then let on tribute to a party of 10 miners who paid the company 15% of any gold yielded. The tributers were reasonably successful and Duff in "*Where Sheep May safely Graze*" (1978:89) implies that these former company miners may have deliberately lost the leader while working for the company. But Gordon, in his report for 1895, makes it clear that the tributers were working in the upper levels of the old workings taking out stone that was considered of too low a grade in the early days of the mine (AJHR 1895 C3:87). The following year Gordon (AJHR 1896 C3:105) reported that the tributers had got 499 ounces of gold from 532 tons of ore for the previous year (1895). At £3.15 an ounce each man would have got (after deducting 15% for the company) about £159 or a little over £3 a week, which compares well with the weekly wage of miners in 1896 which was given as £2.8 shillings in the same report (AJHR 1896 C3a:47).

At this time the London based company was reorganised and more capital was made available. By September 1896 28 men were employed at the mine (*Lake County Press* 24/9/1896). Because of the size of the overall mine workings more than one party of tributers was able to work the mine. In 1898, 27 men were employed at the mine, the majority of whom were tributers working in two separate tribute parties (AJHR 1899 C3:97). During the year 31/3/1898 to 31/3/1899 3108 tons of quartz were crushed for 3451 ounces 8dwts of gold valued at £13,057.15.11, a little over an ounce to the ton.

In 1898 the company was restructured again and a new company, the Cromwell Proprietary Gold Mining Company, formed. 1899 was not as successful as the previous year, 1264 tons were crushed for only 827 ounces 5dwts (AJHR 1900 C3:28). This suggests that the payable stone in the older levels of the mine was becoming exhausted. In 1900 all operations ceased and the mine was closed (AJHR 1901 C3:116).

At the end of 1901 the mine was once again let on tribute, this time to Leo Salmond and party who intended to continue with work on the low level adit (see below). The company also sold the rights to the Matilda battery tailings to the Bendigo Tailings Syndicate who intended to treat the tailings using the cyanide process (AJHR 1902 C3:62). By July 1902 the original tributers had sublet the mine to another party of tributers headed by M B (Melchesidic Bospednic!!) Edwards. The tailings syndicate had, by July, treated 477 tons of tailings for 58 ounces 15 dwts 8 gr. of gold. By October the tailings at the Matilda battery were all but exhausted and the syndicate started setting up a cyanide plant at the old battery site at the base of the hill. However by May 1903 both the work in the mine and the tailings operation had ceased due to poor returns (AJHR 1903 C3:109, 169). The mine was then sold for a small sum to

D.B. Waters a mining engineer who was representing a small syndicate (*AJHR* 1904 C3:66).

In 1904 the Cromwell Mine Syndicate let the mine to Edwards and Pascoe on tribute again but once the tribute period expired all work on the mine ceased (*AJHR* 1905 C3:58). The following year (1905) the mine was let on tribute to the Cameron brothers who fossicked around on the reef out crops and did a little sluicing. The syndicate was engaged in trying to find capital to extend the low level adit (*AJHR* 1906 C3:61). The syndicate was unsuccessful and sold the mine to J. Stevenson of the Dunedin Engineering Works who formed a small company, not with the intention of working the mine itself but of using the water right and races to sluice the terraces along the Bendigo Creek (*AJHR* 1907 C3:35). Sluicing continued into 1907 although it was restricted by the limited availability of water. The company also considered extending the low level adit (*AJHR* 1908 C3:33).

The mine changed hands again in 1908. It was bought by a small company made up of a number of local residents who, as with the previous company, were not particularly interested in the mine itself but in the plant. This time half of the battery (10 stamps) was shifted to the mine near the Thompson Gorge road east of Bendigo (*AJHR* 1909 C3:36). They tested the Come in Time mine on a small scale and thought that it would pay if worked on a larger scale. However, as the warden reported, "such was not the case."

In 1910 the Cromwell Gold Mines Development Company was formed. It had sixty share holders and a paid up capital of £1500. The company intended to continue driving the low level adit so that it intersected

Welshtown interpretation panel.



with the existing shaft. Nine men were employed during 1911 and the tunnel was driven another 600 feet (*AJHR* 1912 C3:54). But in the end this company also ended in failure and in March 1913 the mine and plant was offered for sale in the *Cromwell Argus* (Duff 1978:90). The final work on the old Cromwell Company mine was in the 1930s when Charles Todd, the son of the former manager, formed a company in 1933 to continue the low level adit. Over the next few years the tunnel was driven on for a total length of 2100 feet without intersecting the main reefs. The company was then wound up and the claim and plant sold in August 1938 (*Cromwell Argus* 91-92).

THE LOW LEVEL ADIT

As previously mentioned much of the effort in final years of Bendigo was directed at the low level adit. The production costs of quartz mining were much lower if an adit or tunnel was driven into a hillside to hit the reef rather than a shaft being sunk vertically on a reef. An adit was self draining and did not require expensive pumping equipment. Particularly in later years at Bendigo water in the lower levels of the shafts became a serious problem. Similarly there was no need in an adit for winding gear to raise and lower men and ore.

The use of a low level adit at Bendigo was first mooted in August 1870 when Broadfoot and company and the Iguana Co. (the 2 lowest reefs on the range) were said to be amalgamating to drive a deep level in from Bendigo Gully to work both claims (*Dunstan Times* 26/8/1870). As nothing further is recorded of this plan it is doubtful whether the drive was ever started. Two years later "Viator", a fairly regular Bendigo correspondent of the *Cromwell Argus* (11/6/1872) advocated a tunnel from either Bendigo Gully or Swipers Gully to intersect the main reefs (Logans, Aurora, Colclough, Broadfoot and Iguana).

At the end of 1874 a company called the Cromwell Deep Lead Quartz Mining Co. was publicly floated (*Dunstan Times* 4/12/1874). However there seems to have been some problem with the share issue and the company never eventuated. It wasn't until the following year that the low level adit became a reality. The Bendigo Deep Level Quartz Mining Company applied for registration in June 1875. The company had 40000 shares at 5 shillings each, a working capital of £10000 and a 56 acre claim (*Cromwell Argus* 12/5/1875, 16/6/1875). Among the shareholders were George Goodger of the Cromwell Company and local businessmen Charles O'Donnell, William Smith and Josiah Mitchinson. The tunnel itself was in Bendigo Creek just above its junction with Perrys Creek.

The tunnel was to be driven by contractors. By September 2 parties had tried and failed and a third party of 6 was about to commence (*Cromwell Argus* 22/9/1875). At the end of the month the tunnel had been driven for 125 feet (*Cromwell Argus* 29/9/1875). In May 1876 the level was in 306 feet and by June it was completed at a total length of 375 feet. The only reef encountered was at 360 feet and contained no gold (*Cromwell Argus* 29/9/1876, 8/6/1876). Despite this failure the company intended

to drive the tunnel further. However no further work seems to have been done. There was a forced sale of the assets (a 300 foot tramway, 400 yards of fluming, a blacksmiths shop and an iron roofed cottage) in October 1877 and the company itself was wound up in May 1878 (*Cromwell Argus* 23/10/1877, 14/5/1878).

The idea of a low level adit resurfaced in the late 1880s when the London based Cromwell Gold Mining Co. took over the mine. It is difficult to tell from the official records when the adit was commenced but it was before 1892 as in August of that year mining engineers recommended to the company board that the deep level adit in Bendigo Gully be extended (*Otago Witness* 4/8/1892).

CONCLUSION

The irony of Bendigo is that only one reef system among the several in the area proved to be remunerative, often spectacularly so. The Cromwell Company mine was almost the sole source of encouragement for quartz mining at Bendigo. At the same time it must have been particularly infuriating for the other companies, who were struggling to meet production costs let alone make a profit, to see the monthly returns being posted by the Cromwell Company.

The Cromwell Company mine at Bendigo was at one time (and may yet still be) the most successful quartz mine in Otago. In the 1895 Mines Statement (*AJHR* 1895 C3:87) it was reported to be the only Otago mine

Looking south from
Welshtown to Pisa Range



that paid significant dividends to its shareholders; as much as £400,000 was believed to have been paid out. For much of its productive life the mine was in the hands of only three shareholders. Considering that at the same time the average wage was less than £200 a year it is clear that for Logan, Garrett, Hebden and Baird the mine was the source of a phenomenal individual income.

However, in the end, the Cromwell Company mine also failed. The last twenty years of its operation was a story of unflagging optimism in the face of ever more discouraging results. The 520 foot shaft (or as it is popularly known today the engine shaft or no. 2 shaft) and the deep level adit were vain attempts to return the mine to the profitable days of the 1870s. Large amounts of capital were expended for no returns. The various owners of the mine laboured under the same illusion that afflicted many gold miners - the assumption that because a mine or claim had yielded large amounts of gold in the past that somehow similar amounts of gold were still in the ground just waiting to be found. This was almost never the case, at Bendigo it took 20 years for this realisation to be made.

BIBLIOGRAPHY

Newspapers:

Cromwell Argus

Dunstan Times

Lake County Press

Otago Witness

Appendices to the Journals of the House of Representatives (Annual Mine Statements)

Duff, G. 1978: *Where Sheep May Safely Graze*. Published by the author.

Parcell, J. C. 1976: *Heart of the Desert*. Whitcoulls, Christchurch.

From Peter Bristow's August 1997
document OTACO-4053

Published by:
Department of Conservation,
Research, Development &
Improvement Division,
18-32 Manners Street, Wellington
June 2007