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THE EXCAVATION OF A SMALL CHINESE MINING SETTLEMENT AND STORE,  
ARROWTOWN, CENTRAL OTAGO

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Cromwell

In 1983 the author was contracted to undertake an archaeological investigation of a small Chinese mining settlement (Sl23/249) and associated store (Sl23/250) at Arrowtown, Central Otago. The site, originally one of about 15 Chinese urban enclaves which developed adjacent to the established goldmining towns in Otago, will be the sole surviving example of its type (with substantial structural remains) after Cromwell's Chinatown is inundated by the formation of the hydro reservoir, Lake Dunstan, in 1987. The latter site was excavated in 1980 (Ritchie, 1980, 1983). It is maintained by the Lands and Survey Department as a unit of the Otago Goldfields Park. This will continue until the site is inundated.

The Arrowtown site was acquired by the Goldfields Park in 1982, with the intention of developing it as a replacement for the Cromwell site. In the short period the relatively undeveloped Cromwell Chinatown site has been managed, it has become the most popular unit in the Park with annual visitor numbers in the order of 10,000. Understandably, this level of visitor interest spurred the Department's interest in the Arrowtown site.

The first stage of site development in Arrowtown involved clearing enough vegetation to facilitate mapping and archaeological investigations of the structures and associated deposits. This work was undertaken over November-December 1983 (Ritchie, 1984). Although the Arrowtown settlement is less than half the size of the Cromwell site (in terms of population and structures), it has an advantage from a development point of view, in that a former Chinese store adjacent to the habitation area is still standing. The store (locally known as 'Ah Lum's' after its last owner) has also been acquired and will be restored as part of the site development. In the following account the settlement (the residential area and store) are referred to as the 'Arrowtown Chinese Settlement' (or A.C.S.). This report should be regarded as a preliminary account only. Detailed descriptions of the structures and the analyses undertaken to date are presented in the interim report (Ritchie, 1984).

Historical background

An outline of the course of Chinese settlement in New Zealand has been presented in earlier reports (Ritchie, 1980,

1983, 1984). Chinese gold diggers made their first appearance on the Central Otago goldfields in the latter part of 1866 and were well established by 1870 (Ritchie, 1983:3). As was happening around other goldfield towns, the nucleus of a Chinese settlement developed at Arrowtown (on the south bank of Bush Creek). Its location there was possibly spurred by the establishment of a Chinese store, an event which was viewed with concern by Europeans (Dunstan Times, 17 Sept. 1869:2). Like the European miners in the area the Chinese were primarily interested in winning alluvial gold from the Arrow River and its tributaries. They set to the task promptly - "At the Arrow River the Chinese are engaged in testing the gorge, which has been repeatedly tried and abandoned in consequence of the great difficulty in reaching bottom ..." (report of the Mining Warden, Queenstown, Otago Witness, 19 Feb 1870:10).

Although no specific instances of violence are known towards the Arrowtown Chinese, from the outset some Europeans made it clear they were unwanted; in fact, some of the most vociferous early anti-Chinese agitation emerged from the Wakatipu district (e.g. Otago Witness, 15 Oct 1870:11; Hall and Scholefield, 1937:262). In 1871 the Arrow District Miners' Association drew up a petition which was circulated around the Otago goldfields and Dunedin. It sought the Governor "to include a clause in the new Goldfields Act forbidding the issue of Miners Rights to Chinese and place an effectual bar on their further influx". Continuing agitation led the government to set up a select committee in August 1871, to investigate the effects of Chinese immigration in New Zealand and culminated (in 1881) in the first of a series of legislative restrictions on Chinese immigration.

Despite the anti-Chinese sentiment, by 1885 the Arrowtown settlement had grown and consisted of two discrete areas - an elongated scatter of about ten mud and/or stone huts sited along the foot of the terrace bordering Bush Creek, a 'social hall' known locally as 'the Chinese long house', and at least two stores (Ah Wak's and what is now known as Ah Lum's) located at the eastern end of the terrace immediately above the huts. An 1887 photograph (Lakes District Museum EL 286) clearly shows extensive Chinese gardens which were established on the sloping ground immediately west of the stores and above the huts. By 1910 some of the huts had been abandoned and Ah Lum's was the only store still re-tailing.

The size of the settlement as determined from the structural remains, census records, early photographs and accounts of contemporary observers (notably the Rev. Alexander

Don, Presbyterian missionary to the Chinese) indicate that its average pre-1900 population was about 15, declining to about ten between 1900 and 1910, falling to about six between 1910 and 1920, with final abandonment occurring shortly after the death of Ah Lum in 1927. The settlement had approximately the same time span as the Cromwell Chinatown settlement (i.e. from c.1869 until the 1920s); that heyday being from 1870 to 1885.

The population of many of the urban Chinese camps swelled over the winter months when conditions in some out-lying areas were too difficult for mining. The 'over-winterers' stayed temporarily in a friend's hut or had their own hut for the purpose. Initially most lived in communal huts (between two and eight men per hut) but after 1900, when the Chinese in Otago and racial intolerance had both decreased, there was an increasing trend towards solo living.

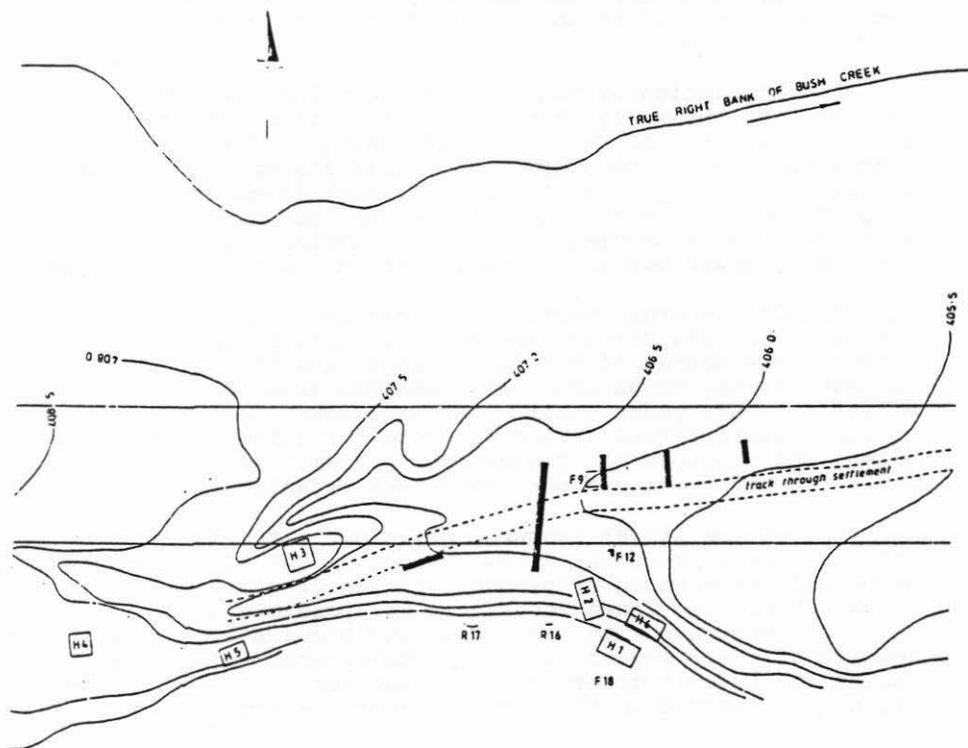
The Don records (particularly his 1896 'diary' of the movements of 1080 Chinese men clearly indicate there was considerable degree of mobility amongst the Central Otago Chinese as they moved from one goldfield area to another, often to return years later. At Arrowtown, the loft in Ah Lum's store served as a guest room for itinerant travellers and visitors (A. Dudley, pers. comm.) and possibly whilst incoming Chinese got themselves established.

Unlike the larger Cromwell Chinatown site, many of the later inhabitants of the Arrowtown settlement are still personally remembered by present day senior citizens of the Arrow district. Consequently, it was possible to link specific dwellings with particular individuals and record details of their way of life, personal characteristics and habits which would otherwise have been lost. This information is presented in the interim report (Ritchie, 1984).

#### The site

Arrowtown Chinese settlement is located on the true right bank of Bush Creek. It stretches upstream for a distance of about 200 m from a point just above the creek's junction with the Arrow River. The residential huts were strung out along the margin of the sloping ground on the south side of the creek. The stores occupied a small terrace above the huts at the eastern end of the settlement.

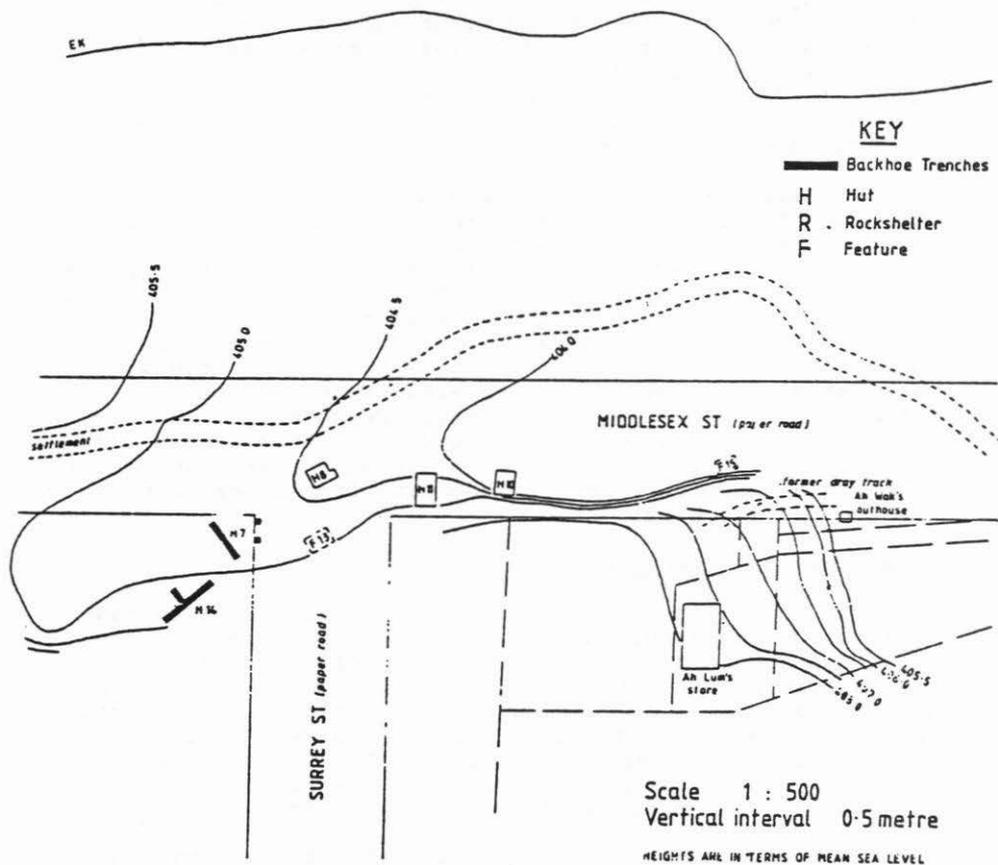
Before 1890 the broad creek mouth was virtually bare of vegetation. The creek tended to meander across the river flat dependent on the seasonal flows and the effects



## CHINESE SETTLEMENT - ARROWTOWN

Surveyed by M.J.Pollitt

FIGURE 1. Arrowtown Chinese settlement.



and sedimentation caused by mining further upstream. Early photographs indicate that by 1887 young willow trees had become established and the ground around the huts had a low weed cover.

Today the vegetation around the huts is dominated by large willow trees and exotic scrub such as broom. At the western end there is a stand of large poplar trees and beyond these the stunted remains of an old orchard which post-dates the Chinese occupations. At the eastern end of the site several plum trees, probably planted by the Chinese, are scattered amongst the hut sites.

To facilitate the excavation a major clearing operation was undertaken. This work was efficiently carried out by a PEP tree and scrub felling gang who worked for ten days, initially carrying out a major area clearance, followed by spot clearances as required. Trees with good shape and condition were left standing whilst all fallen, dead or malformed trees were removed. The standing trees provide shade, scale and a scenic element on what would otherwise be a rather bare setting. The area where the Chinese gardens were located was not cleared because it was felt little could be gained from the exercise, some of the land is now private property, and the vegetation makes an effective visual barrier screening the site from modern houses now located above it.

#### Investigation objectives

The immediate objective of the excavation was to maximise knowledge about the site's occupation through excavation and documentation before it is modified in the course of restoration and public site interpretation by the Otago Goldfields Park. Archaeological excavations prior to site development are an important tenet of the Park's policy (O.G.P. Policy Statement, 1983:15). The objective was to be achieved by exposing and recording the structural remains followed by systematic excavation and recording.

From the outset it was expected that the excavation would yield a considerable body of artefacts and faunal remains, from which new data could be derived on several broad research queries presently being addressed by the author and overseas researchers. These include - (a) further elucidating Chinese subsistence and social patterns; (b) determining the nature of the settlement, its role in the immediate area and within the wider context of nineteenth century Chinese settlement in New Zealand; (c) defining the origin and usage of all artefacts and expanding

knowledge of their origin, manufacture, variability and social role; tightening our ability to date historical sites by detailed chronological/historical studies.

To date 16 Chinese mining/habitation sites have been excavated in New Zealand. They are all in the Cromwell area and have been investigated in the course of mitigation work associated with the upper Clutha power scheme (Ritchie, 1983).

#### Investigation procedure

Before excavation commenced historical research was undertaken drawing on archival, ethnographic, historical and early photographic sources. The ethnographic research (mainly interviewing elderly informants) also served as a useful public relations exercise.

The site was cleared (7-18 November) to enable the nature and condition of structural remains to be determined and a plan to be drawn of the surface features. As the clearing advanced, excavation commenced (14 November - 22 December). This involved systematic excavations in and around structures, ash/dump deposits and features such as retaining walls. A tractor blade was used in the latter part of the excavation in an attempt to find possible buried midden deposits and traces of the former 'long house'.

#### Structural remains: the residential area

The main residential area was dominated by a large wooden building known as the Chinese 'long house'. Unfortunately, there is now no trace of this structure. The central location on which it stood, now a grassed clearing was ploughed many times about 1930 (A. Dudley, pers.comm.). The building, as judged from an 1887 photograph, was of weatherboard construction, some 15 m long, 4 m wide and had a gable height of about 3 m. Although it had collapsed or been demolished by about 1900, it is known to have served as a social hall and meeting place.

Trenches excavated by blade in the area where the 'long house' was located, revealed no positive traces of the structure, although clear stratigraphic evidence of successive flood silt depositions and the later ploughings were apparent. The building may have collapsed or been critically damaged by flooding, leading to its abandonment, gradual collapse, demolition or removal.



PLATE 1. Excavation of Hut 4.



PLATE 2. Hut 5 after excavation.

West of the long house site the remains of six huts (H1, H2, H3, H4 (Plate 1), H5 and H6), a small midden (F9), two rockshelters (R16 and R17) and a revetted garden terrace (F18) were uncovered, whilst to the east there are another four huts (H7, H8, H10 and H11) and two midden deposits (F13 and F15). All the huts appear to have been habitations, except the larger Hut 2 which is believed to have served as a social venue. There are considerable differences in construction of the Arrowtown structures compared with those at Cromwell and elsewhere in Central Otago.

The most significant difference between the huts at Cromwell and Arrowtown is their construction materials. At the former they were built almost entirely of cobbles (principally of schist and greywacke) which were derived from old European tailings in the area. At Arrowtown the two entirely stone huts (H2 and H5) are made of relatively small slabs of schist laid horizontally (Plate 2); but the majority are of either puddled mud (or mud brick) construction or a combination of mud and stone construction. The differences (and range of materials used at Arrowtown), I believe, depend on the Chinese' resourcefulness in using materials to hand. Schist was collected from an outcrop forming a small cliff behind the huts. Mud was excavated from the interior area of proposed huts.

Surviving huts at Arrowtown are generally smaller than those at Cromwell. At Cromwell the average floor area of the surviving structures is  $8.3 \text{ m}^2$ , whereas at Arrowtown it is  $7.3 \text{ m}^2$ , but only  $6.23 \text{ m}^2$ , if the larger socialising hut (H2) is omitted from the calculation. Although the dimensions of two former large huts (H7 and H14) are now discernible, the majority of Arrowtown huts are smaller than Chinese huts elsewhere in Central Otago. The smaller size of Arrowtown huts is difficult to explain, but does not appear to be due to poverty.

According to a contemporary observer of the last Chinese at Arrowtown, Huts 3, 6, 7, 8 and 11 (and possibly others) had tussock thatched roofs about 1920-26. The roofs were renewed annually. Study of the 1887 photograph indicates that the 'long house' was roofed with corrugated iron, as was Ah Lum's store, whilst Huts 2 and 4 were thatched. Other structures appear to be partially roofed with short sheets of material, possibly flattened kerosine tins. Some of the Chinese huts photographed by Don on his travels around the goldfields show tussock thatched huts overlaid with rice bags or canvas. Study of the 1887 photograph indicates this may have been the case at Arrowtown in some instances because there appears to be some material overlying the thatch.

Window glass was recovered in most of the huts at Arrowtown, whereas it was found in only two huts at Cromwell. This is probably attributable, in part, to the high incidence of European larrikinism and vandalism directed towards the Cromwell settlement and its inhabitants. Although many Chinese huts did not have windows, at Cromwell they appear to have foregone them completely rather than put up with the expense and hassle of replacing broken panes and the risk of sustaining possible injury from breaking glass and stones.

At Cromwell the fireplace in every hut is on the right hand side of the doorway as you enter, whereas at Arrowtown (in those huts where it can be determined) the fireplace is situated either side of the doorway in fairly equal ratios. Hut 5 is a notable exception; here the doorway is in the side of the hut, a relatively unusual position. The hut also differs in that it is the only one in the settlement which is built into an adjacent bank rather than freestanding. At Cromwell 70% of the huts have two walls built into an adjacent bank, the others being freestanding or built back to back.

Two main trends are discernible at Arrowtown with regard to hut door orientation. The doors of the long house and Huts 2, 3, 4, 5, 7 and 8 faced north-west (towards the creek) whilst most of the others (including Ah Lum's store) faced in an easterly direction. Huts 1, 6 and 10 may be exceptions but their door locations cannot be positively ascertained. At Cromwell, the hut doors faced in every direction. Clearly orientation is partly dependent on topographic restraints and to a less tangible extent on Chinese notions such as hindering the path of evil spirits by avoiding building dwellings in straight lines. They also seem to have preferred to face the doorway on to open ground rather than towards a slope.

The differences between the Arrowtown and Cromwell settlements' huts have been highlighted to draw them to the attention of other researchers, so that it can be more clearly ascertained whether they reflect significant cultural trends or localised behaviour patterns. Some of the similarities or differences may be traits introduced by miners from different areas.

#### Structural remains: the Chinese store

Ah Lum's store is situated on a small terrace above the eastern end of the flat where the residential huts are



PLATE 3. Ah Lum's store.



PLATE 4. Ah Lum's store, main room.

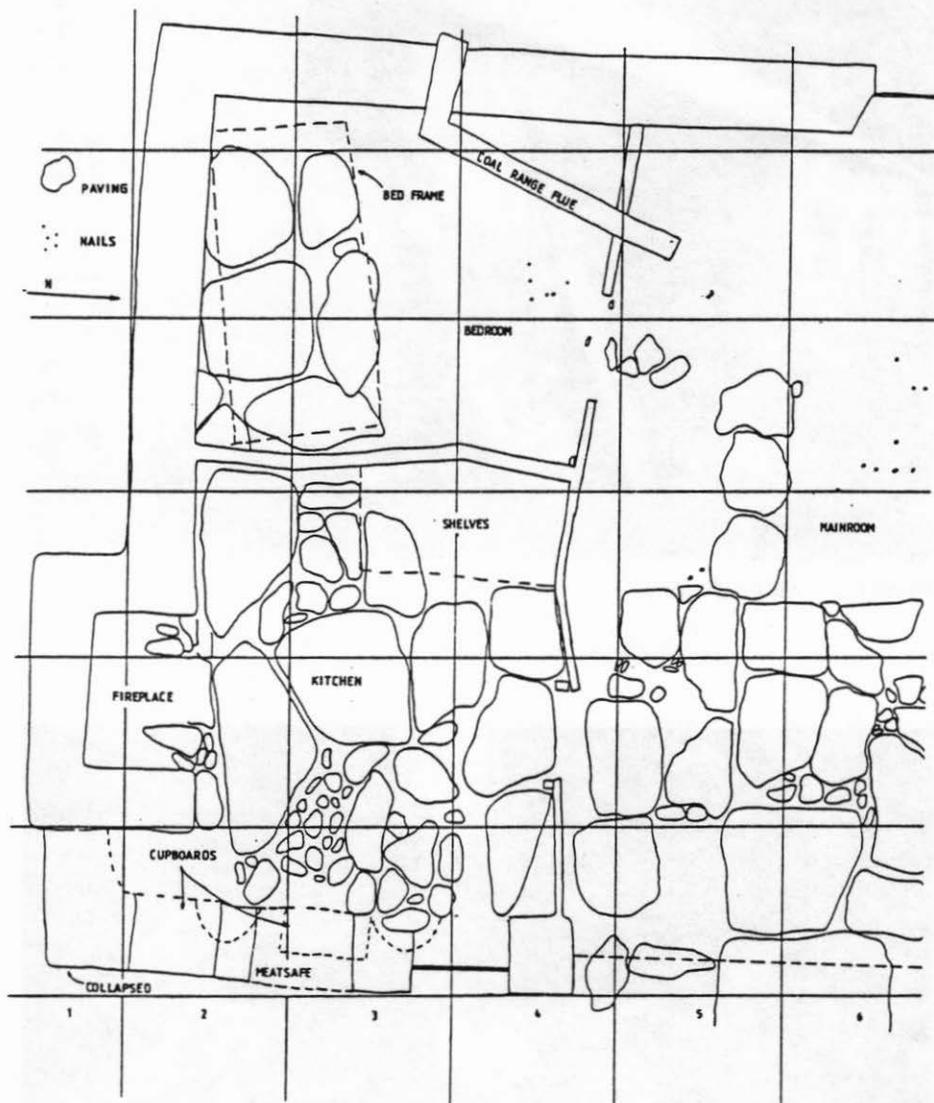
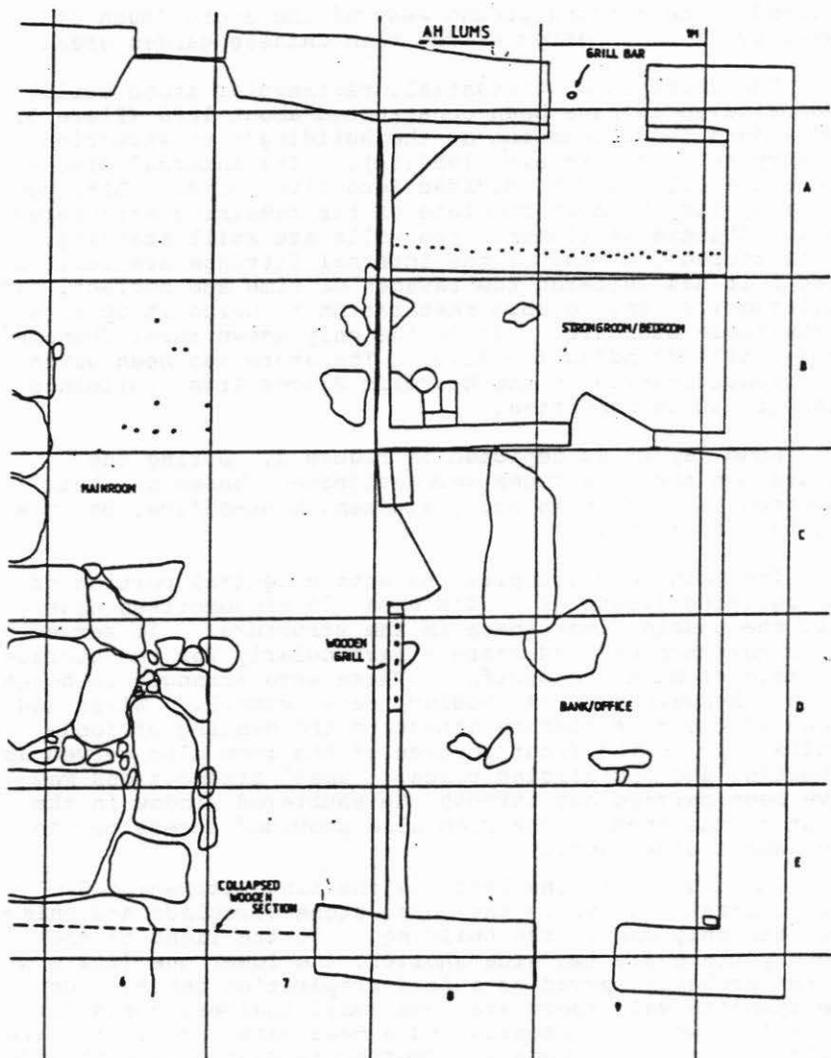


FIGURE 2. Floor plan of Ah Lum's Store.



located. The sloping ground west of the store (much of it owned by Ah Lum) served as the main Chinese garden area.

The store is a substantial, rectangular stone building believed to have been constructed about 1880 (Plate 3; for a detailed discussion of the building's construction history refer to Ritchie, 1984:56). Its internal dimensions are 7.5 x 4.8 m, divided into five rooms. Although it is by far the most complete of the remaining structures in the Chinese settlement (the walls are still standing, it is roofed and many of the internal fittings are still in place) it has suffered the ravages of time and neglect. It will require considerable restoration to bring it up to a presentable standard. It is the only known rural Chinese store still standing in Otago. The store has been given a C classification by the Historic Places Trust Buildings Classification Committee.

Room layout is depicted in Figure 2. During the excavation the five rooms were designated (based on their inferred use) the main room, kitchen, bank-office, bedroom and 'strong room'.

The main room occupies the entire central portion of the building (Plate 4). Its area (15 m<sup>2</sup>) comprises nearly half the usable floor space in the structure. It served as an entrance-way and store - particularly for the storage and sale of bulk foodstuffs. These were arranged in boxes and earthenware jars (A. Dudley, pers. comm.). Wires and hooks in the roof timbers attest to the hanging of foodstuffs, etc. The front portion of the room also served as a meeting and socialising place. Small transactions may have been carried out through the shuttered window in the front of the room. The room also provided access to the four small side rooms.

Immediately to the left, is the tiny kitchen of 5 m<sup>2</sup>. The dominant feature is the large stone fireplace and chimney; the only one in the building. To the right of the doorway there are two wide shelves, the lower one (1.2 m x 60 cm) probably served as a food preparation bench. On the opposite wall there are some small shelves, hooks for utensils, two box cupboards and a meat safe (the latter are built into the stonework). Newspapers pasted on both sides of the wall separating the kitchen from the 'bedroom' include fragments of a late 1870s edition of the Tuapeka Times. Another fragment, part of a Glasgow Weekly Herald, is dated 14/1/1882.

The room at the left rear of the building was dubbed the 'bedroom' because of the presence of a poorly constructed 'sleeping platform'. This small room (about 5 m<sup>2</sup>) is without windows and so dark and poorly ventilated. An earlier observer (Cree, 1960) called the room "a small den - a veritable Black Hole of Calcutta". His implication that the room served as an opium den cannot be discounted, although there was little artefactual support for this.

The doorway into the room dubbed the 'bank-office' serves both rooms on the north side. The room was so named because of the presence of a wooden grilled serving window. The grill is well made, incorporating vertical wooden battens slotted into a frame (70 x 60 cm). The battens are dressed and chamfered on the front face and flat on the back, giving a tidy finished appearance. Originally the grill could be closed by pushing across a sliding shutter - now only the grooved tracks remain. As Ah Lum was recognised as the settlement's 'banker' and interpreter, as well as store-keeper, this room is almost certainly the place where major money transactions occurred. It also probably served as an office, and storage and display area for more valuable products. There are brackets on the back wall for shelves. An interesting feature of the single exterior window is that it was curtained with a piece of heavy calico (an old blind). The material is secured with nails capped with washers made from pieces of opium can metal (portions of the opium can labels still adhere to the metal).

The smallest room (4 m<sup>2</sup>) in the store was dubbed the 'strongroom' because the window was fitted with iron bars (only one remains). The room's relatively fine finish and juxtaposition to the bank-office suggested (at the time of excavation) that it may have been a bedroom. This was later confirmed; in fact, Ah Lum, who had a bed there, died in the room (A. Dudley, pers.comm.). Assuming that the room was used as a bedroom for most of the building's occupation, the barred window would have increased the security of both the bedroom and the adjoining bank-office and ensured that the owner was near his valuables in case of theft or burglary. An iron pot, uncovered in the floor of the south-east corner, is an interesting feature of the room. The exact role of the pot can only be conjectured, but similar features incorporating ceramic pots (their tops flush to the ground surface) were found in two huts in Cromwell's Chinatown. In each instance no residues were found in the pots. This feature may be associated with worship (incense burning?).

The artefacts

Imported Chinese ceramics. A minimum of 137 units of imported Chinese ceramics (food containers and domestic crockery) were uncovered during the excavation.

Type/product	Residential area	Ah Lum's
Ng Ka Py	27	6
Brownwares		
Shouldered food jars (large)	14 (11 unglazed lids)	5 (3 unglazed lids)
Shouldered food jars (small)	3	-
Barrel jars (large)	3	3
Soya oil jars	5	4
Globular jars (large)	3	-
Greenwares		
Ginger jars	6	-
Small inset lip pot	2	1 (lid only)
Grey flanged lid with orange slip	1*	-
Beige glazed flanged lid	1**	
Brown glazed lid (probably for large preserved food jar)	1***	
Totals	65	19

\* ginger jar lid: type not previously known from Central Otago.

\*\* only the second example uncovered in Central Otago (ginger jar lid?).

\*\*\* not counted in total.

TABLE 1. Food containers, minimum numbers.

Type/style	Residential area	Ah Lum's
4 Seasons serving bowls (large)	3	-
4 Seasons serving bowls (small)	2	2
4 Seasons spoon	3	2
Celadon large rice bowls	2	-
Celadon rice bowls	23	2
Celadon tea cups	1	1
Celadon small sauce/wine cups	2	-
Celadon spoons	4	1
Celadon shallow dip bowl	1	-
Plain white spoon	-	1*
3 Circles & Longevity rice bowls	1 (blue colouration)	-

Bird & floral motifs on fragments of porcelain rice bowl	1*	-
Japanese teapot with coralene beading	1*	-

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Totals	44	9
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\* not previously found in Central Otago.

TABLE 2. Domestic crockery, minimum numbers.

Glass bottles and containers. A minimum of 425 glass bottles and containers were uncovered during the excavation; 317 (74.6%) being from the residential area, whilst 108 (25.4%) were found in and around Ah Lum's store. (For discussion on the social role of the many bottled products used by the Chinese see Ritchie and Bedford, 1983).

Bottle type or product	Residential area	Ah Lum's
Leather dressing	1	2
Salad oil	3	2
Sauce	6	7
Vinegar	6	3
Pickle jars	3	1
Jars	3	2
Essence	1	-
Miscellaneous	7	7
Inks	2	-
Blacking	2	-
Fruit salt jars	1	-
Coffee and chicory	1	-
Small crown top	6	-
Perfumes	4	-
<hr/>		
Total	46	24
% of overall total	14.5	22

TABLE 3. Household and personal glass bottles and containers.

Bottle type/product	Residential area	Ah Lum's
Schnapps	4	5
Liqueur	1	-
Flasks	9	3
Whisky	29	-
Gins (mostly case)	15	14
Cognac/brandy ring seals	46	10*
Misc. liquors	22	7

Hock/wine	10	1
Aqua 3 piece moulds	-	3
Ring seal beers	57	17
Crown tops	2	-
Black beers	6	2
Misc. beers	12	6
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Totals	213	68
% of overall total	67	63

TABLE 4. Alcohol bottles (\*show signs of modification into opium lamps).

Bottle type/product	Residential area	Ah Lum's
<hr/>		
<u>Chinese</u>		
Medicine	1	1
Tincture vials	10	1
<u>Pharmaceutical</u>		
Patent medicines	3	3
Medicine	5	2
Enos	1	-
Vials (unembossed)	1	-
Misc.	2	1
Vaseline	1	-
Poison	1	-
<u>Aerated water</u>		
Torpedoes (Hamilton)	1	1
Codds	5	1
Maughams (flat base)	1	1
Crown tops	1	-
Blob tops	1	-
Maughams	1	-
Puriri mineral water	-	2

TABLE 5. Chinese, pharmaceutical and aerated water bottles.

Other artefacts. Other classes of artefacts have not been fully examined yet, so only brief notes can be made here.

European ceramics make up an estimated 30% of the total ceramic assemblage, the main component is English domestic tableware. Tin cans (excluding wax vesta boxes) constitute approximately 20% by volume of the artefacts from the site. Analysis of 222 Arrowtown matchboxes has been completed but no detailed results are presented because the existing typology (Anson, 1983) is presently being revised. The revision will describe several new variants and fit them within a revised framework. The Arrowtown boxes are notable for the

predominance of "R. Bell & Co, New Zealand" boxes. R. Bell and Co started producing wax vestas in New Zealand in 1895, although several earlier types are present, including a ca. 1870 "Bell & Black", they comprise only 25% of the assemblage. However, this may be partially attributable to differential preservation, the younger boxes have had 30-40 years less in the ground.

Miscellaneous and metal artefacts have not been studied yet. They include a wide range of iron and copper items from an equally wide range of contexts, e.g. enamelled wash basins, billies, eating utensils, wok spoons, fire bars, pick heads, door handles, wire hooks, tool fittings, cradle trays, pieces of solidified molten lead, bullet shells and gold blowing trays.

One hundred and seventy-five items of opium smoking paraphernalia from the site (and 20 other Chinese sites in Central Otago) will be discussed in a report currently in preparation. The 18 tobacco pipes (6 clay, 12 plastic) have not been examined yet.

Twenty-one Chinese coins (8 in the residential huts and 13 in the store) were uncovered at Arrowtown. These are presently being examined by Stuart Park, Auckland Museum. The random and sparse distribution of those found in the residential area is consistent with their being accidentally lost. Over half of the coins found in the store were found in the main room. Eighteen English and New Zealand coins (8 in the residential area, 10 in the store) were uncovered. Again, their distribution suggests accidental loss.

All of the gambling pieces which were uncovered (14 white ceramic counters, 1 black ceramic counter and 1 wooden domino) were found in the store (75% in the main room). Limited discussion on their role is presented in the interim report (Ritchie, 1984:66).

Miscellaneous artefacts include items of paper, leather, fabric, wood and plastic. They comprise a relatively small proportion of the total assemblage and have not been examined yet. The artefacts in this category are generally in poor condition owing to the relatively damp soil conditions in the site.

#### Faunal and floral remains

Butchered animal remains were found in and around most of the structures in the site. The bones have not been examined yet, but observations of the material as it was

unearthed indicate the presence of beef, pig, sheep, rabbit, hen bones and eggshell. Most of the bones bear butchering marks (sawcuts, and cleaver and knife cuts).

Large numbers of fruit stones and seeds were uncovered in and around the huts. However, most were clearly derived from relatively young trees adjacent to the structures. Of the seeds which are believed to be contemporary with the occupation, pumpkin seeds stand out.

#### Acknowledgements

The excavation of the Arrowtown Chinese settlement was only possible through the combined efforts of a large number of people. Their contribution are acknowledged by name in the interim report (Ritchie, 1984). Here, space limitations only allow me to express my appreciation in a collective sense. My thanks to all those who made the operation a success - archaeologists, camp organiser, the PEP clearing gangs, those who assisted with organisational and research matters, the families who made available their cribs for accommodation, the Ministry of Works, Cromwell for the loan of equipment and the Historic Places Trust, Wellington.

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