THE WHITE RANGE SETTLEMENT AREA, ARLTUNGA GOLDFIELD, NORTHERN TERRITORY; A LOOK AT THE LIFE STYLE OF AN ISOLATED MINING AREA USING WRITTEN AND ARCHAEOLOGICAL RECORDS

KATE HOLMES

SYDNEY: 1980

UNIVERSITY OF SYDNEY

FACULTY OF ARTS

HISTORICAL ARCHAEOLOGY

THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF THE DEGREE OF MASTER OF ARTS

"THE WHITE RANGE SETTLEMENT AREA, ARLTUNGA GOLDFIELD, NORTHERN TERRITORY; A LOOK AT THE LIFE STYLE OF AN ISOLATED MINING AREA USING THE WRITTEN AND ARCHAEOLOGICAL RECORDS."

KATE HOLMES

SYDNEY: 1980

University of Sydney

Acknowledgements

The work was carried out over three seasons - a very short exploratory fortnight in May 1977, five months over the winter of 1978, and another three months in 1979. During the nine months, I had an enormous amount of help from many volunteers, although the members varied at any one time from a high of seven to periods when I was on my own. Everyone who helped on the excavations were complete amateurs, and I must thank them most sincerely for coming to the White Range, for coping with the often difficult conditions (1978 was a very wet winter), and my attempts to explain basic archaeological techniques. Those who sweated, shivered, blistered fingers and suffered from painful backs and knees were :

Fiona McAuliffe, Suzanne Staal, Trish Ryan, Steve Doyle, Morrie Stockdale, Joyce Holmes, Klaus Hueneke, David Horn, Ruth Holmes, Rosemary Epps, Eunice Robinson, Jean and Chas Whitla, Margaret Booth, Joy Wilson, Beryl and Geoff Embury, Tom Byrne, Glenys Hall, Ian Jack and Maureen Byrne.

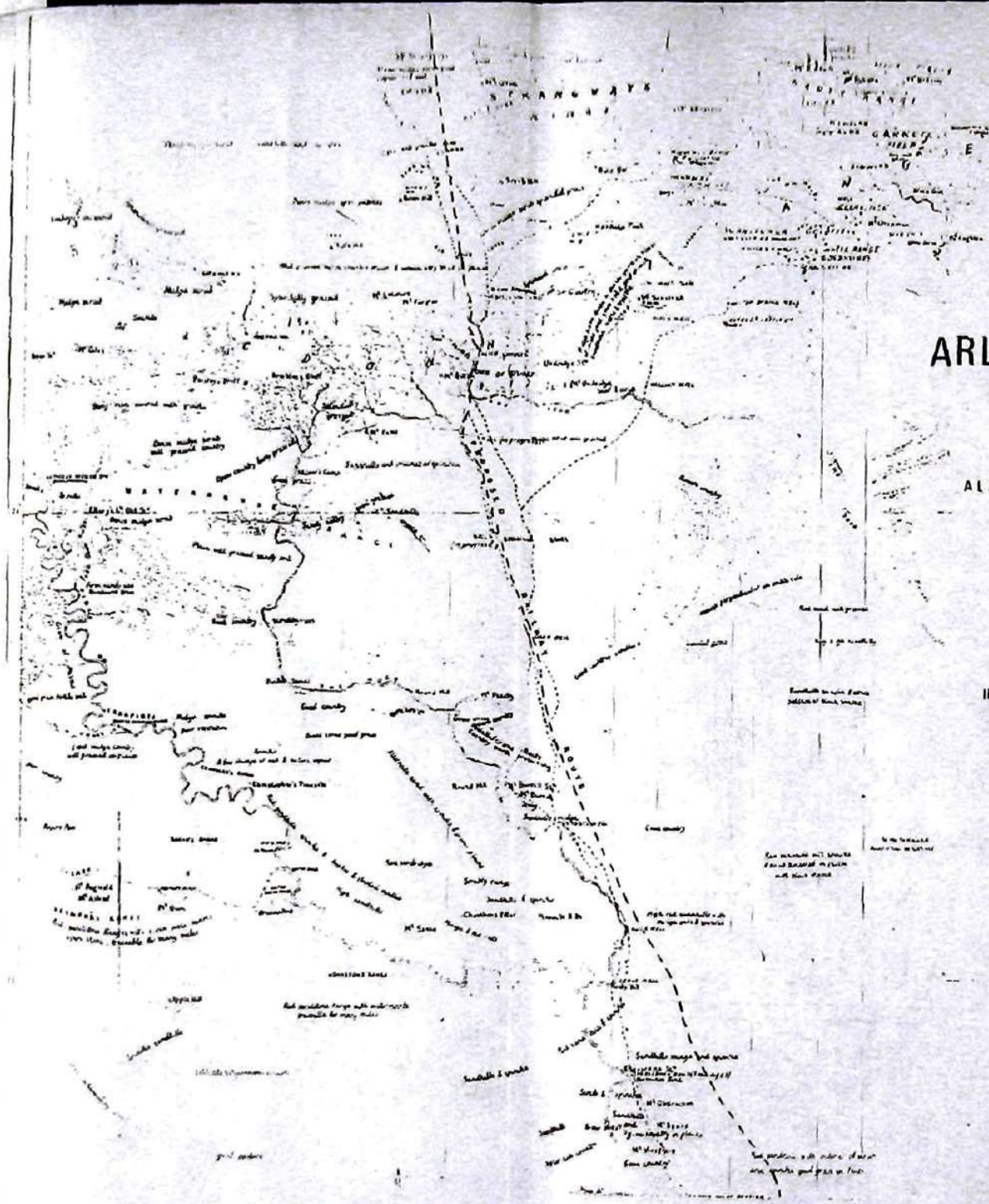
A special mention is necessary for Jenny van Proctor who made two visits, of four weeks each, in 1978 and 1979 and was mainly concerned with the building remains and their planning, along with Andrew Wilson and Fiona Sapsford in 1979. My father R.A.G. Holmes who helped generally in 1977 and came back in 1978 to set up camp, and the two Territory Parks and Wildlife Rangers, Ross Bryan and Sandy Wilson, with the help of Mike Hanzel, who helped get the 1979 camp set up. The Territory Parks and Wildlife have given most generously of their time, equipment and staff and without their backing and help the excavation could not have taken place. The Australian Heritage Commission gave me a handsome grant for the 1979 season and Sydney University contributed to my costs in 1978. And to Helen, Tony, Jim and Pennee Greatorex, who provided a home base and all the comforts in Alice Springs, my most heartfelt thanks. Any many thanks to supervisor, Judy Birmingham for her visits, help and advice.

My research took me to the State Archives in Adelaide and the Commonwealth Archives in Canberra and Darwin, and all the help from the staff in those archives was vital in writing the history of the goldfield. In particular, I was most impressed with the help from the South Australian Archives, where I spent some five weeks in March 1978. The State Library of South Australia, the National Library, and the Mitchell Library in Sydney and Fisher Library at Sydney University all provided more information.

On the more technical side, I would like to thank the Department of Illustrations, Sydney University and David Campbell of Yass, who filled in some last minute gaps, for excellent photographic work; David Hill for conservation advice; Prof. Butterfield for identification of the bones, and Whendy Thorp for some marvellous drawings, especially as I was not available to help her. Jill Godfrey kindly typed the first draft of the history, then sensibly left the country, leaving the final task to Janne Coleman, tacking a thesis for the first time. Ian Diggle gave me the run of his office for photocopying and last minute typing, for this I thank him. Sue Bowie was absolutely invaluable in helping to pack up the artifacts for their return to Alice Springs.

While the Territory Parks and Wildlife and Heritage Commissions have largely enabled this work to take place, the one person without whom it would have withered and died at the beginning is my father, who not only helped, but gave up his Range Rover to me for two seasons, provided camping equipment and helped drive back and forth.

PART I: HISTORICAL INTRODUCTION.



SOUTH AUSTRALIA.

SKETCH PLAN (REVISED)

SHOWING

ARLTUNGA & WINNECKE'S DEPOT, GOLDFIELD,

IN THE MACDONNELL RANGES.

ALSO THE ROUTE, WATERS, &c. BETWEEN OODNADATTA AND THE FIELD.

Published by authority of the Hon. the Minister Controlling the Northern Territory

H. Y. L. BROWN

Government Geologist

REFERENCE

INDEX, 8a - The Red Stars *indicate approximately the areas over which Gold has been or is being mined for.*

DISTANCES BETWEEN PLACES

OODNADATTA to ALICE SPRINGS TELEGRAPH STATION	330 MILES
ALICE SPRINGS to ARLTUNGA Police Station	53 "
WINNECKE'S to GOVERNMENT CAMP	15 "
ALICE SPRINGS to ARLTUNGA via Police Station	61 "

TRACKS SHOWN THUS

NOTE

SCALE

Part of Map by H.Y.L. Brown, 1902, of route through the Northern Territory to Arltunga and Winnecke's Depot Goldfields.

GENERAL HISTORY OF THE ARLTUNGA GOLDFIELD

The Arltunga Goldfield of Central Australia was discovered by accident, after the discovery of "rubies" in the Harts Range area, north east of Alice Springs. The first to note the stones, rubies or garnets, was Charles Winnecke in his explorations in 1878,[1] but the great public interest came after David Lindsay covered similar territory in 1886. Lindsay was very impressed by the stones; on March 8th he recorded "At midday we found ... a granite bed crossing the creek, the granite completely studded with garnets or rubies ..."[2] Although he remained unsure of the real worth of the stones, he organised another trip to the fields in September 1887, by which time the rush to the rubies was well under way. The numbers involved in the ruby rush were quite extraordinary, given the extreme isolation of the Hart's and MacDonnell Ranges, but can be explained by the economic conditions in South Australia. The state had suffered from droughts, bad harvests and falling prices for some years before 1886, when the economic outlook suddenly improved. The drought broke, wheat and wool prices went up, the Broken Hill silver mines were very promising, and gold had been discovered at Teetulpa.[3] The economy continued to improve, which encouraged speculation, and the Hart's Range rubies caught the public eye. By July 1887 "ruby mining lease mania (was) .. prevalent in Adelaide."[4] This was enough to encourage men to leave Adelaide and try their luck in Central Australia.

---

1. Charles Winnecke, Explorations to the Qld border, 1878. He established a Depot during his explorations which later became famous in the rush of 1902-4.

2. David Lindsay, An expedition across Australia from South to North, between the Telegraph Line and the Queensland border, 1885-6. He was in the area of the Hale River, near Harts Range, for several days.

3. T. A. Coghlan, Labour and Industry in Australia, vol. IV, pp1791-1804.

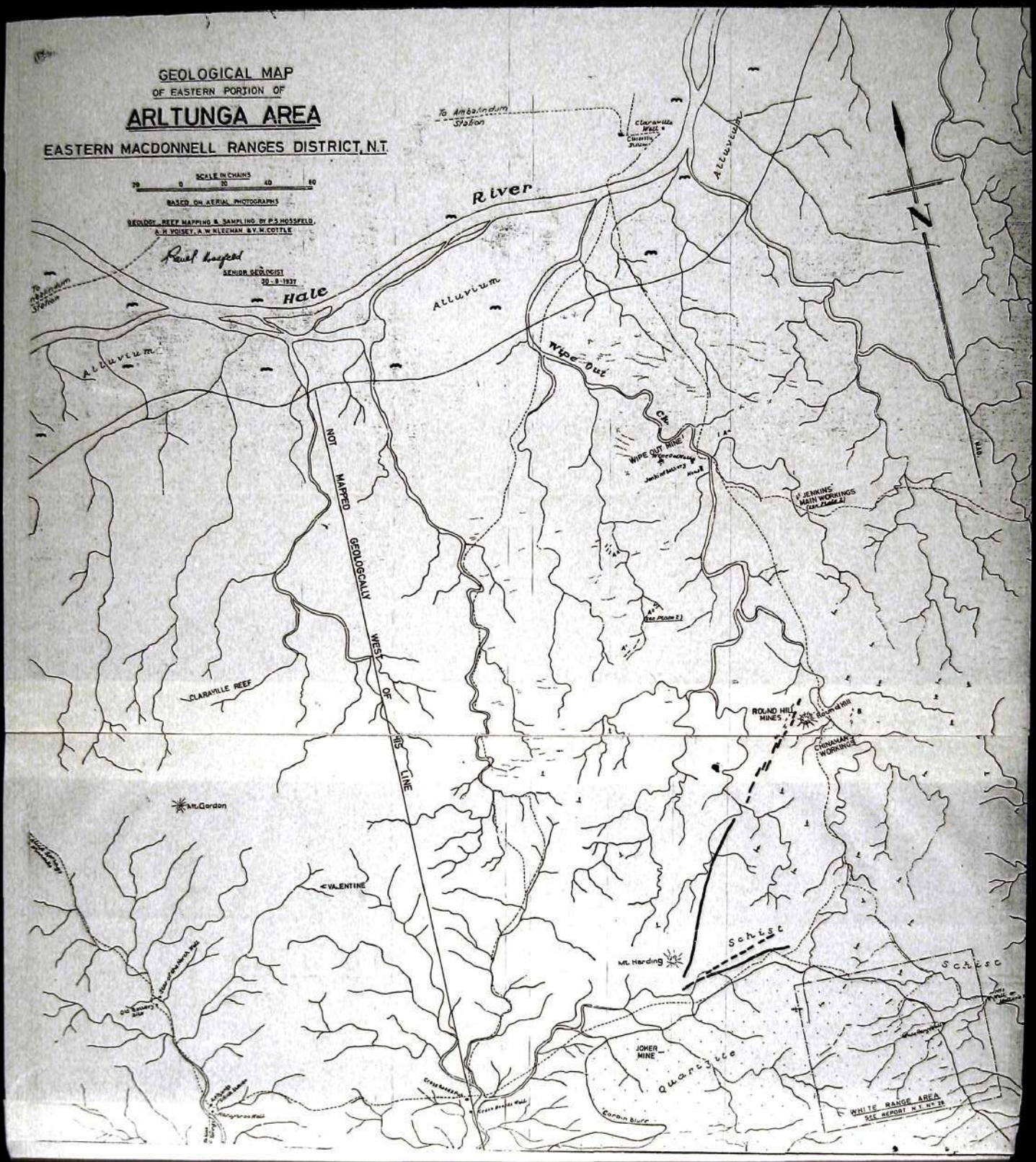
4. Port Augusta Despatch, July 26th, 1887. "Everybody wants to ... make a colossal pile out of precious stones."

As early as August of 1887 when Mounted Constable Wurmbrand reported on his visit to the ruby fields, he talked as much about the "gold bearing country" as the garnets. Applications for mineral licenses and miners rights were being made from April 1887, and as the number of prospectors increased, the police at Alice Springs were inundated with requests for information. In July Mounted Constable Willshire was made Warden for the mining district, some 80-100 miles away.[1] The emphasis was still on rubies, with gold just a gleam in the gound, but by November men were wanting to register gold reefs.[2] The population on the fields was now about 30, and had been as high as 42,[3] apparently enough to encourage the application for a hotel site at Heavitree Gap,[4] south of Alice Springs, though not enough to encourage setting up business on the field itself. At this time there was no township at Alice Springs, just the men of the Telegraph Station, and a small police camp which moved to Heavitree Gap during 1887.[5]

By December the police had sent patrols to the fields on two occasions, and had quite a lot of contact with miners coming to Alice Springs to pick up mail and supplies. The population on the ruby fields was estimated at 60, with another twenty men at Paddy's Hole. This is the first direct reference to gold in the area later known as the Arltunga Goldfield.[6] The first application for registration

---

1. SAA 790/1887/512, July 27th. The South Australian Government, through the Minister for Education was responsible for the Northern Territory. A separate Department was created in 1892.
2. Telegram from MC Hillier, acting Warden, November 21st, 1887 (SAA 790/1887/923).
3. Ibid, office memo attached to telegram.
4. Application by W. Benstead, SAA 790/1887/670
5. The police had been stationed at the Telegraph Station, in tents. With the increase in work, and population, they asked for a more substantial building at the Gap, for greater security. SAA GRG 5 1887/65.
6. Police report, SAA 790/1888/121. The Rock-hole may have been named after Paddy Fitzpatrick; Arltunga was the Aboriginal word for rock-hole.


GEOLOGICAL MAP
OF EASTERN PORTION OF
ARLTUNGA AREA
EASTERN MACDONNELL RANGES DISTRICT, N.T.
SCALE IN CHAINS
BASED ON AERIAL PHOTOGRAPHS
GEOLOGY, REEF MAPPING & SAMPLING BY P.S. HOSSFELD, A.H. VOISEY, A.W. NLEEMAN & V.M. COTTLE
SENIOR GEOLOGIST
30-8-1937
To Ambalindum Station
Claraville Well
Claraville Station
Alluvium
River
N
Hale
Alluvium
Alluvium
Wipe Out
Wipe Out Ck.
WIPE OUT MINE
JENKINS' MAIN WORKINGS
NOT MAPPED GEOLOGICALLY WEST OF THIS LINE
CLARAVILLE REEF
ROUND HILL MINES
CINNAMON WORKINGS
Mt. Gordon
VALENTINE
Mt. Harding
Schist
Schist
JOKER MINE
Quartzite
Corbin Bluff
WHITE RANGE AREA

of a gold reef came in December, 1887, from Thomas Hussey, William Cooper, Joseph Hele, John Davis and John Fleming.[1] Others mentioned included R. Smith, J. Byrne, R. Palmer and P. I. Fitzpatrick who applied for a reward claim in 1888.[2] Problems arose almost immediately, partly because the police knew little about the mining regulations, and partly becuase mail took a long time to reach Adelaide. An Adelaide syndicate tried to take out sixteen leases of 40 acres each, around Paddy's Hole, but after long correspondence, the prospectors on the field had their claims upheld.[3]

This flurry of activity occurred during the first quarter of 1888, but rubies were still the main draw although the lack of water was becoming a great problem. The police reported 150 to 200 men on the ruby fields in March,[4] but by July the numbers had decreased with the news that the rubies were really garnets.[5]

By September the Alice Springs correspondent of the Observer was concentrating on the gold reefs, mentioning the Wheal Fortune, Albion and Great Matrix. There was very little surface water apart from Paddy's Rock-hole, and when the Government Geologist H. Y. L. Brown visited it in November, only one claim was being worked.[6] At Paddy's Hole the population of twelve included two storekeeper/

---

1. Ibid. The reef was 1½ miles north west of Paddy's Hole.
2. SAA 790/1886/68.
3. SAA 790/1888 files 8, 26, 58, 66, 104, 107, 121 etc. The situation was complicated because applications had to go to Darwin, via Adelaide and Sydney. In attempts to solve the problem many long telegrams were sent.
4. SAA 790/1888/169 and 206.
5. Ibid, and the Observer, July 28th 1888, p. 34.
6. Brown, H. Y. L. Report on a Journey from the Hale to the Adelaide River, 1888: "At my visit very few men were on the field owing to want of water". Also Observer, September 22nd. p. 39.

butchers who must have been struggling under such conditions. Still, the police felt that the goldfield would be productive, and suggested that a town be laid out "at or near Alice Springs".[1]

For the next few years the small group of miners and prospectors sweated it out under extraordinarily hard conditions. There was no mail service to Arltunga until January, 1891 despite several requests and deputations, and then it came only once a month.[2] The water situation had improved slightly when a Government well sinking party arrived and worked on wells at Claraville and Paddy's Hole. Several small mills had arrived by 1890 to crush stone - one at Paddy's, another at Claraville and a third on the Hale.[3] At least the reef miners were spared the necessity of sending their ore on the long journey back to Adelaide for testing. A succesion of dry years and constant use by "residents, horses, cattle and blacks, plus gold washing"[4] put further strain on water supplies. Despite these difficulties, which meant that work was suspended on occasions, the warden reported in March 1892 that the field has supported some thirty to fifty men since 1888.[5]

The South Australian Government did what it could to encourage mining in the Alice Springs district by financing several prospecting parties. The first set out from Adelaide in 1891, but a year later had found little to justify its existence.[6]

---

1. SAA 790/1888/314 - report by Inspector Besley of Port Augusta, 26th May. He felt there "would be ample employment for a large number of trades people there ..."
2. SAA 790/1889/589, 1890/625. There was a mail service from Oodnadatta to Alice Springs once every six weeks. SAA 790/1889/442.
3. A report by S. Dyke, on taking over the well-sinking party in January, mentions the machinery. SAA 790/1890/165. Warden South reported on it in February - SAA 790/1890/239. For more information on wells, see section on Water and Wells, pp.
4. H. Y. L. Brown, report of 13th April, 1891. SAA 790/1891/266.
5. SAA 790/1892/118. On his visit in early March about 40 men were working, some using dry blowers. SAA 790/1895/286.
6. SAA 790/1891/145,146,295,283; 1892/83 - 85. The operation cost £2,462.

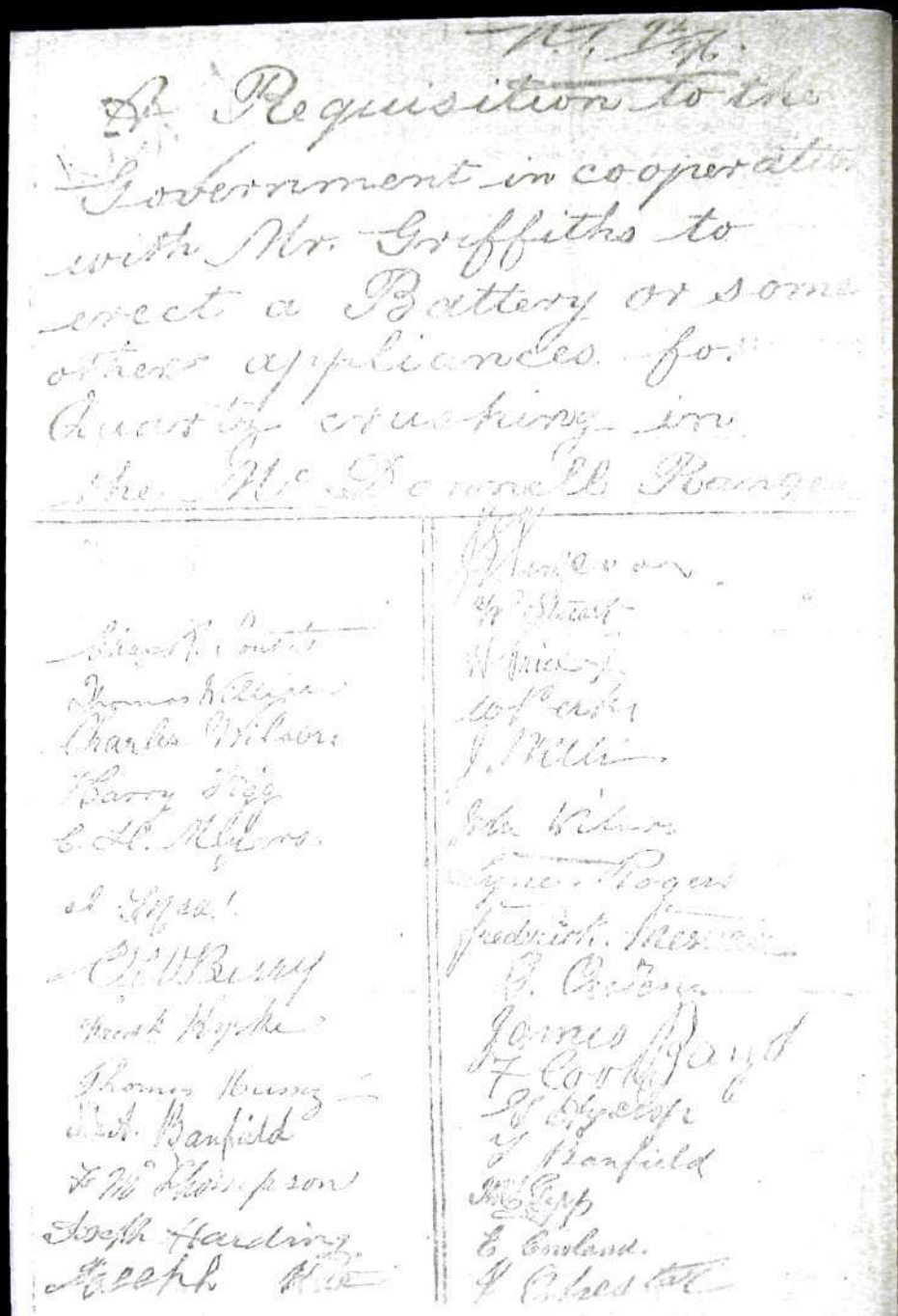
In 1894 good rains encouraged the warden to suggest that the Government pay some of the prospectors already on the field to explore further afield. An allowance of 25/- to 30/- was made to several men who prospected areas around Star Creek, east of Arltunga, and Winnecke's Depot to the north west.[1] The results were encouraging, but Star Creek was even more isolated that Arltunga, with the same water problem, and Winnecke's Depot had to wait until the rush of 1902 to be developed. Other requests for help ranged from the provision of rail tickets to Oodnadatta (second class, of course) to the loan of camels, and subsidies to help sink shafts on the field.[2] Few of these requests cost the Government much money as would-be recipients found that the money had to be repaid and was not a straight grant. One of the few to benefit was John Smith of the Wheal Fortune, who was able to sink a shaft with Government help in 1899.[3]

By the mid 1890s the field was sufficiently well established for the police to request that a full time Warden be appointed. M. C. South recommended Johan (sic) Ferdinand Mueller "... once Senior Inspecting Officer on the Overland Telegraph Line, (who) afterwa rds went to Adelaide where, I regret to say, -- he became partial to intoxicants, but I have known him for the last eight years on the Algibuckina and Arltunga fields during which time he has been sober hardworking and honest .."[4] Mueller accepted the position and took over in April 1895, moving the warden's office to Paddy's Hole for the greater convenience of the miners.

Work continued steadily, without any spectacular finds of gold, or great increase in population figures, but in February, 1896, 39 miners petitioned Mr. Griffiths, M.P., for the Government

---

1. SAA 790/1894/130. The operation lasted from April to June.
2. SAA 790/1896/300, 421; 1897/277; 1901/318,414; 1895/150 re subsidy for shaft sinking.
3. SAA 790/1889/427. Unfortunately Smith was badly informed within a fortnight of receiving the subsidy, and was away for 10-11 months.
4. South was leaving Alice Springs and made this suggestion in October. SAA 790/1894/284. Mueller may have been on the field since November, 1887 - a J. Mueller was mentioned then (1888/121).



Petition for the erection of a Battery at Arltunga, 1896.

"to erect a Battery of some other appliance for Quartz crushing in the MacDonnell Ranges".[1]

By this time there was high unemployment in South Australia and the eastern states, due to the depression and the bank failures of 1893. A Parliamentary Select Committee on Unemployment had been set up in June 1894 which suggested, among other things, moderate expenditure on prospecting and "remunerative public works".[2] The Government Geologist, Mr. H. Y. L. Brown was sent up to report on the field yet again. He arrived on April 30th and found only 25 diggers, although more reefs had been discovered and worked since his last visit in 1890. He recommended that a ten head stamper battery be erected near the Claraville well.[3] In view of that, the petition, unemployment and the fact that 1896 was an election year, it was not suprising that the Government finally approved the establishment of the battery on 15th June, 1896. It was opened on 8th February, 1898 by Mr. Gillen from the Alice Springs Telegraph Station.[4]

It had been a long hard battle to get all the equipment and men from Adelaide to Arltunga. There were problems in obtaining the machinery and then transporting it, by rail to Oodnadatta and then 368 miles overland to Arltunga. It was difficult enough to get the men up - eleven arrived in Oodnadatta on December 27th, 1896 to find that six only

---

1. SAA 790/1896/72. Mr. Griffiths sent the petition to the Minister for the Northern Territory, Mr. Holder, saying that he had felt the necessity for a public battery for the last three years. Residents around Claraville area had petitioned for a battery as early as 1890, without success.
2. T. A. Coghlan, op cit, pp 2070-71.
3. H. Y. L. Brown, Report on the Arltunga Goldfields and Hart's Range Mica Fields ...1896. The Huntingdon Mill was still working, and he included the tonnage crushed and the gold yield. SAA 790/1895/463. This file contained a letter from R. J. Egerton Warbuton suggesting a battery be erected on the MacDonnell Range Goldfield, 26th December, 1895.
4. The Observer, Feb. 19th, 1898, reports speeches by Mr. Woolcock, Manager, Mr. Gillen, Mr. Harding, Mr. Luce and Mr. Chambers, most looking forward to a prosperous future.

were expected. Having sorted this out, the party eventually reached Claraville on January 31st, four weeks out from Oodnadatta; by February 10th some 24 tons of loading had arrived, but few tools and no machinery.[1] The difficulties were exacerbated by a fire at the Oodnadatta goods shed in January, and some of the replacement orders didn't reach Arltunga for over a year.[2] A worse blow was the need to move the battery site - the newly sunk well at Claraville was dry after 163 feet, and as at least 1,000 gallons a day were needed to run the stamper the plant and machinery were moved to the Star of the North well, some seven miles to the south-west. It was necessary to "pull down and remove the present buildings, office, store and blacksmiths shop as timber (was) scarce at the new site."[3] The move cost slightly under £100, the rebuilding went ahead as quickly as possible, and finally the battery crushed its first order.[4]

At the beginning of 1898 the future of the field looked very promising - not only was the public battery working, but late in 1897 the rich reefs of the White Range had been discovered. J. Byrne had worked the alluvial during that year, but it was H. E. Luce who realised the reef potential. He pegged out claims by February 1898, closely followed by J. Byrne, T. Williams and G. Besley, Smith and Patterson, C. Williams, duBois and Gall, Wilson May and Woods.[5] Very

---

1. SAA 790/1897/83. Report by Manager Woolcock, also 790/1896/489.
2. SAA 790/1897/32; for report on the fire; 1898/46.
3. Manager's report, October 20th, 1897. SAA 790/1897/83.
4. The S.A. Government had to subsidise the running of the battery from the first - by December 1899 the setting up and running fo the works had cost £4,522, with an income of £692. SAA 790/1896/475. The losses became greater as time went on.
5. H. Y. L. Brown, Report on the White Range Gold Mines, etc., 1902. He mentioned that J. Byrne discovered alluvial gold first, before Luce prospected for reef gold.

little work had been done on the field for some months before the opening of the battery, as claim owners were waiting for results from the stone already raised, before continuing with the backbreaking work.

By April, 1898 the battery had crushed 200 tons of ore and had received applications for another 200 tons, but already difficulties had arisen. The battery belts were of inferior quality and the boiler was too small to work the well pump, the rockbreaker, sawbench and battery together, which meant that delays were frequent.[1] It was obvious as early as July that the White Range was producing the most gold, even from shallow workings, but the men were worried. A relatively minor complaint was that gaps in the floor allowed gold to slip through, but the real difficulty arose from the unsuitability of the boiler which was "liable to collapse at any time".[2] As it happened, the boiler lasted until December, 1901.

The small isolated community struggled on. Population figures are hard to establish; there were at least 28 on the field in May 1899, they signed the petition about the boiler, and there may have been 60 by September.[3] During the winter an increasing number of claims were worked "within easy distance of the battery, cartage of stone being a considerable item in the expenditure."[4] This greater activity seems to have brought the miners and surrounding pastoralists into conflict. The

---

1. SAA 790/1898/34. April report. In July the carters could not bring in enough stone to keep two shifts going.
2. SAA 790/1898/217, letter from the Claraville Prospecting Syndicate about the battery floor; SAA 790/1898/234 petition signed by 27 men, that a new boiler and engine be provided for the Works. In a covering note the Manager said there was no immediate danger of collapse, although boiler and engine were not completely suitable.
3. Report by Constable Cowle, SAA 790/1898/365.
4. Warden's report, May 1898; in August he reported on better reefs eastward for some 30 miles, but difficulties with water supply and expense of cartage are too great. SAA 790/1898/46.

Director of the Willowie Pastoral Company, which ran Undoolya Station between Alice Springs and Arltunga complained that "We are credibly informed that ... a great amount of drunkedness and unseemly behaviour frequently occurs at the mining camp."[1] As horse duffing and cattle stealing occurred, he felt that anyone butchering cattle should be required to show the beast to the police before killing it, and that Arltunga needed police protection more than Alice Springs. While the police did not quite agree with the last statement, they did approve the establishment of a camp at the goldfield. Mounted Constable C. P. Johnstone left Alice Springs on February 14th, 1899, and reached Arltunga three days later. On his arrival he found "..the Goldfields men have been very orderly and quiet, but I have heard that they were not so before I arrived here."[2]

The Government agreed to other requests for improvement during 1898 - for a better mail service, and for a well at the White Range. The fortnightly mail service between Alice Springs and Arltunga began in March 1899,[3] and Sam Olsen began sinking the White Range well in February. After fifty feet the well made about 40 gallons a day, and work continued through very hard rock. In October, at 145 feet the supply was 120 gallons per day, only enough for domestic purposes - the Warden complained of the very dry year, the worst since 1890.[4] No more sinking was done until after the dry summer left a dry well, but extra sinking and driving in the winter of 1900 did not add to the supply. The sinking of another well at the White Range, which dragged on from 1902 until 1905 was even less successful although sunk to 250 feet.[5]

---

1. Letter of August 19th, from E. H. Bakewell, Director. SAA 790/1898/365. The Battery Manager had already suggested that a constable be stationed on the field because of the gold held at the battery. SAA 790/1898/46.
2. SAA 790/1898/448.
3. The White Range well petition had 31 signatures, and was dated May 1898 (SAA 790/1898/258). The improved mail service was brought up by Solomon and Griffiths, the M Ps for the area "... in view of the increasing importance of the Arltunga Goldfield. SAA 790/1898/343.
4. Ibid, 27th October, 1899.
5. SAA 790/1902/228. The site of the well was chosen by Mr. Brown on his visit to the White Range in May 1902.

The drought not only made work difficult in the mines, but finally stopped the horse teams carting the ore to the battery, for lack of feed. By May 1900 the manager of the Battery suggested that camels should be sent to the field; the battery wasn't working full time as the teams had to be spelled every few weeks. The camels arrived in July and seem to have sparked off quite a disagreement between the battery men on one side, and the miners led by one of the storekeepers, J. Harding (who also ran one of the horse teams).[1] Harding seems to have a certain bargaining power over the miners - he allowed a lot of credit on stores to the struggling men. The warden also sided with the miners, saying that the camels were driven by Afghans who couldn't be given Miners Rights, being of Asiatic origin. The Department was not impressed with this argument, there was no reason for carters to hold rights, and told warden Mueller that no exemptions were to be allowed to men refusing to use the camels.[2] The matter was resolved when the drought broke in November, but there were other instances of bad feeling between the "Government men" at the Works and the rest of the population. Letters of complaint bombarded the Department in Adelaide, but the excitement gradually died down - as the manager pointed out, "'Grog' is mostly responsible for the recurrence of nasty feeling and actions and must be allowed for."[3]

---

1. SAA 790/1900/308. With the battery running at a loss, the manager needed to boost revenue whereever possible. His application for an increased salary had been disallowed in 1899 because of the "serious falling off in ...fees". Between January and November, 1899 the operating loss was £4,000. SAA 790/1899/231.
2. SAA 790/1900/386. The Warden pointed out that the European teamsters held miners rights in case of accidents. If a load was accidently dropped by the road, anyone could come along and peg it, if the driver didn't do it first. The Minister was not convinced.
3. Letter of 29th September, 1900. SAA 790/1900/423.

In February, 1901 six inches of rain fell which improved well supplies, but in the short run made the roads impassable for the horse teams. During the autumn and winter work went ahead briskly with the manager reporting the arrival of several newcomers.[1] In November the battery well was failing "...one reason is that never had (there been) such a continuous run of crushing as in the last three to four months."[2] It would be a great pity if the battery was forced to stop, just when the claimowners were doing so well -"H. E. Luce has eight working for him, plus six tributers." The well deepened to 98 feet by December 5th, which provided plenty of water, but then the boiler burst, which stopped the battery until July, 1902. Fortunately the Department allowed the manager to give advances on ore raised, calculated on previous results.[3] This enabled claim owners to continue work, and in February the warden reported about 50 men working at the White Range, and about the same number of aborigines. Towards the end of the year activity increased despite the lack of feed which slowed down the horse teams, and gold was discovered at Winnecke's Depot, some 35 miles north-west of Arltunga, in November.[4] There were 25 men at this new find at the end of November, and by February, 1903 about 300 had reached the field.[5]

---

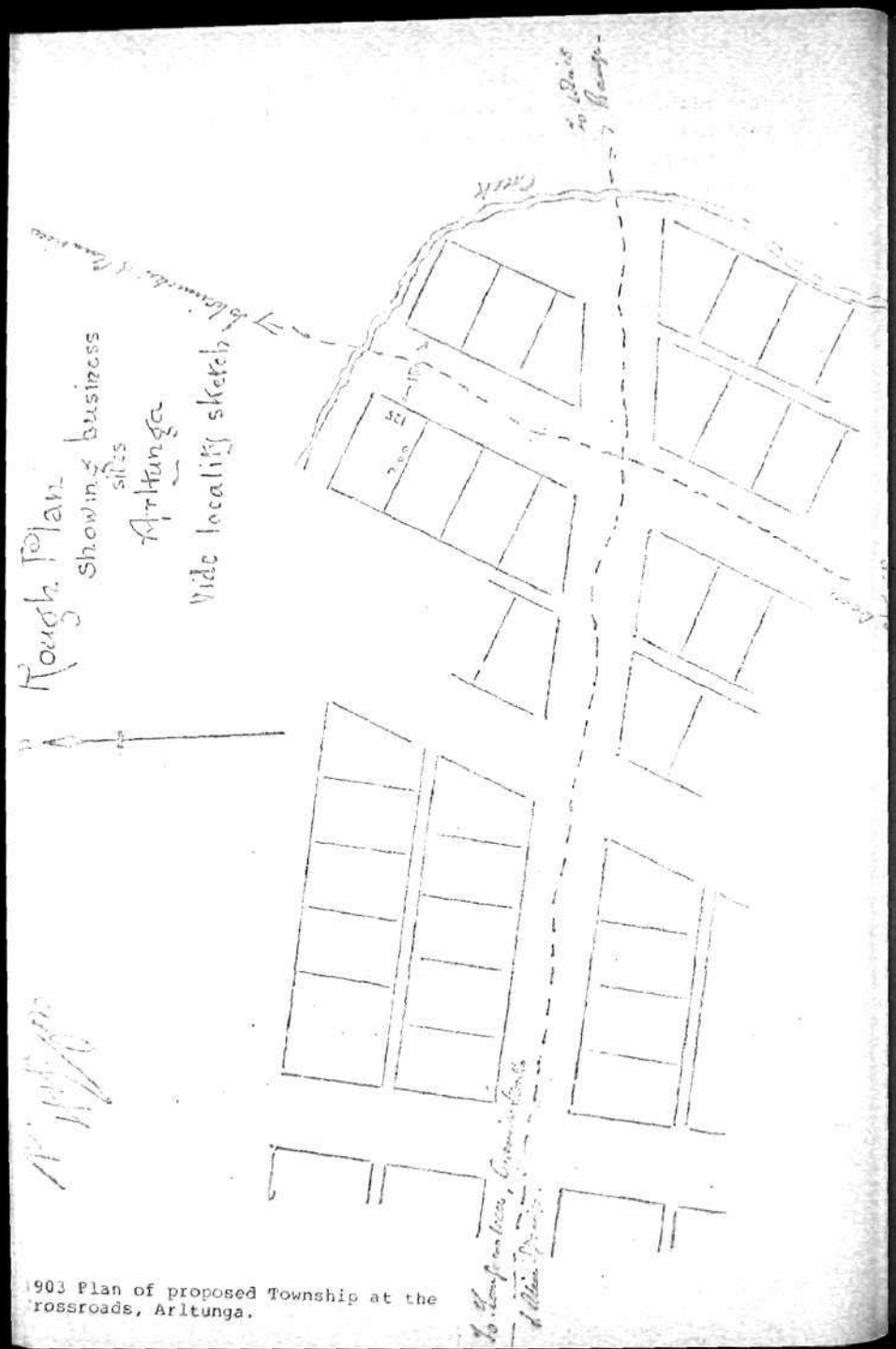
1. SAA 790/1901/34, August 1st. He said it was a very good "poor man's field" though the previous Manager Grundy, had said the opposite in February, 1900.
2. Ibid, report of November 9th - 15 men had recently arrived and there were reports of 3 more coming. In December, Manager said "new arrivals of a better stamp continue to arrive... Luce may get 25 tons a month suggesting 3 shifts" SAA 790/1901/554.
3. Warden's report, January 6th that work was satisfactory. SAA 790/1902/77.
4. SAA 790/1902/437
5. Letter from Herbert and Mitchell, MPs, 9th February 1903 (1903/95).

This rapid increase caused great problems. The amount of work and travelling between the fields was too much for one man, and Mr. L. C. E. Gee was sent up to take over the warden's duties, with Mueller as his assistant. Unfortunately they were unable to prevent the Winnecke well from becoming contaminated: the Chairman of the Winnecke Vigilance Committee telegraphed to the Minister about the "grave danger which present large influx (of) inhabitants may cause this community owing to entire lack of sanitary arrangements, and preservation of water."[1] The Vigilance Committee was elected after a public meeting on 12 April, the miners were so concerned about the situation.

Earlier, in February, there had been requests for a doctor, nearer the field than Oodnadatta, and eventually Dr. P. J. Shanahan was appointed on 23rd June,1903. This was too late for some of the victims of the typhoid epidemic which broke out about then: Stephen Arbran ill on June 24th and died two days later.[2] Dr. Shanahan arrived in Alice Springs on 11th July, and remained to take care of four typhoid victims in the town. On July 21st a messenger arrived from Winnecke's Depot, reporting six more victims, and the doctor moved to the field. Despite his presence there were three more deaths - John Radon and Charles Tywell from Winnecke's and Mrs. Raggatt at Alice Springs.[3] The epidemic was short-lived, but Dr. Shanahan's reports paint a graphic picture of Winnecke's Depot:

---

1. SAA 790/1903/260, April 16th. Police Constable Nalty was made Health Inspector, and Manager Grundy reported on April 20th that "I don't see ...that we can do more than compel the various camps to erect closets and burn all tins that have contained preserves of any kind...the field generally is clean and free from sickness."
2. SAA 790/1903/411 Telegram of Chairman of Vigilance Committee. For Dr. Shanahan's appointment see file 134.
3. Reports of the Medical Officer, July 22nd (SAA 790/1903/497) Dr. Shanahan described the sanitary arrangements in Alice Springs as "a serious menace to the Community" and puts a lot of the blame on the Aboriginals and "their filthy habits". Deaths reported 1903/415,455 and 477.



1903 Plan of proposed Township at the crossroads, Arltunga.

> "..Excrement of Human Excreta being deposited promiscuously ad lib in every direction. The difficulty of securing supplies (of water) for Human Consumption became so great that niggers were sent below to wallow in the water and fill the drawing bucket with a quart pot.... Sanitary arrangements ...have received my closest attention and all necessary improvements have been affected.."[1]

The typhoid outbreak was confined to Alice Springs and Winnecke's Depot, the Arltunga field being much better off for wells, and with a lower population to support. To make sure that the good record was kept up, the policeman stationed at Arltunga was appointed Health Inspector, to see that proper sanitary arrangements were made and kept.[2] The population at Arltunga and Winnecke's Depot may have been anything from three to five hundred strong by 1903, and considerable interest was being taken in the prospects of both fields. The outlook for Arltunga was so good that in May 1903 the residents petitioned for a township site to be laid out at the cross roads where the Battery, Claraville, White Range and Paddy's Hole roads met. This was followed up by a letter from the Arltunga Progress Committee, saying that they wished to "carry out cleaning of Camping Grounds, erecting Public Latrines and maintaining proper sanitary conditions ..."[3] Warden Gee recommended it as a central and open site, and that it, had been a favourite camping area for some time. The petition mentioned that some of the business and residence sites had been applied for, and several others had buildings on them. The general impression seems to have been that the field was about to be properly developed, and so it was time to consolidate all the public offices in one central area.

---

1. Medical Officer's reports, op cit, August and September. Interestingly enough this is the first reference I have come across of Aborigines being referred to as "niggers".
2. Reports of the Health Inspector, SAA 790/1904/28, 1905/72, 1906/22, 1907/28, 1909/62 and 1910/63. In 1907 both whites and aborigines suffered from severe colds, and again in 1911.
3. SAA 790/1903/446. The Committee was worried about the sickness at Winnecke's, and hoped to prevent its appearance in Arltunga.

If the Township had been developed, it is quite possible that the Post Office, Warden's Office and Police Station would have moved there.[1]

On of the main reasons for optimism was that the rush to Winnecke's and Arltunga had attracted some of the larger mining companies to the area. The White Range was the main centre of interest, and it seemed possible that, at last, the Range would realise its true potential.

When Henry Luce pegged out the first claim on the Range, in 1898, he picked a winner. Luce's White Range was the richest claim of the whole goldfield, followed by the White Range Excelsior, Great Western, White Range Extended, White Range North, White Range East, White Range West and White Range South claims.[2] In all, some 250 acres were taken up by 1902, including some of the more inaccessible parts of the Range,[3] but the earlier claims retained their superiority. Within the firstyear the gold yield per ton had improved from an everage of half an ounce to at least one ounce, despite "being worked under disadvantage at present as there is no water within a reasonable distance."[4] Water was a major problem from the beginning, along with lack of capital and the expense of carting to the battery. The quartz rock was extremely hard, and Mr. Geologist Brown described the method of work after his visit to the Range in 1902:

> "The present method of working on account of the hardness of the rock is a slow and laborious one, and consists of making small drives and excavations following the largest and most perustant seams, vughs and quartz bodies, which are known to contain gold in sufficient numbers to be profitably worked."

---

1. Ibid, covering report by Warden Gee, dated July 21st.
2. Results of crushing at the Government Battery, published in 1904. Luce's White Range had produced 2,555 oz. gold, valued at £10,086. The Wheal Fortune mine, operating for most of the mining period may have produced as much, but there is no official record during the first ten years.
3. Warden's reports, SAA 790/1901/58 and 1902/77
4. Manager's report, SAA 790/1898/46.

He went on to suggest various improvements, i.e. the use of open cuts, bagging of material and the building of wire tramways to transport ore to lower ground. He also described the "dressing" of the ore:

> "The stone obtained from the workings is broken up on a smooth rock floor or on a bullock hide, then hand-picked and sifted; the solid white quartz is rejected and the cellular quartz, gossan etc. and siftings are saved for treatment. Stone showing a large percentage of cellular quartz etc. is not broken up but saved entire for crushing. The proportion of stone saved for treatment after dressing varies from 20% to 50% of the whole raised. The dressing process is carried out to save expense in the cost of carting and treatment at the battery."[1]

The hard, bad working conditions were not helped by the lack of water, and the sinking of two wells between 1899 and 1905 did little to improve the water supply. It is possible that if a good supply of water had been tapped at the White Range, the Battery and Cyanide Works would have been moved to this area.[2] The usual climatic extremes played their part, as in the rest of the field: droughts prevented the cartage of stone, as did heavy rain, which also flooded the mines.[3] The White Range Excelsior, pegged by C. Williams was soon formed into a Syndicate, and by 1900 was floated into a company, with Williams retaining an interest. Most of the claims were owned by more than one man, and it is a feature of the White Range that most miners had interests in several mines, either as part owners or tributors. The same names crop up all the time - H. E. Luce, L. Schaber, F. Cook, C. A. Eales, C. Williams, J. Pound, J. Wilson, H. Perkins, F. May, W. F. Messau, P. O'Neil and C. Anderson being some of the most obvious.[4] The situation may have made it easier to contemplate taking over the whole of the White Range and working it as one company.

During 1899 the Manager of the Battery mentioned a visit by

---

1. Brown H. Y. L. , op cit, 1902.
2. Report by the Manager, April, SAA 790/1900/7 - he had been approached by some of the miners about the possibility of moving, but the works needed 3,000 gallons per day.
3. In March 1901 soaking rains even washed away some ore stacks. SAA 790/1901/58
4. From Battery records in Australia Archives, Darwin, listed and sent to Territory Parks and Wildlife Commission, Alice Springs (file 61/86).

Mr. Davidson, "an expert" who was greatly pleased with the large bodies of ore on the White Range"[1] but his South Australian backers decided against forming a company. In 1902 the Manager was asked to report on Luce's White Range and White Range Boulder claims. He concluded that they could be worked more economically as one unit, with enough capital to provide "... up-to-date rock drills, a 40 to 50 head battery with concentrating plant,....aerial tramways ... cyanide plant and a large pumping plant ..."[2] With this report, and the presence of Mr. Chalmers on behalf of the Consolidated Goldfields of South Africa, in July 1903, the future looked very bright.

Mr. Chalmers arrived early in July, and such was his interest in the White Range claims, especially Luce's, that most owners applied for and got work exemptions until the outcome of his inspection was known.[3] By July 17th Chalmers had come to the usual decision that the ore had not been proved to any depth, but he, Luce and the owners of White Range Extended were prepared to put down a shaft and cross drive.[4] The excitement at the White Range must have been intense: the first real chance to develop the field properly was at hand. In view of this situation, Warden Gee was very hopeful about the future prospects of the field, and its development into a thriving community, but suddenly, on July 27th, the deal was called off.[5] Chalmers felt it was too risky as the reefs had not been proved to any depth. This had a drastic effect on the numbers coming onto the field, and the Progress Committee "practically ceased to exist."[6] There was plenty of activity on the White Range,

---

1. Davidson was at Arltunga in November. SAA 790/1899/32
2. SAA 790/1902/161, April. The work done so far, for want of capital, was "very primitive ... No shaft sinking, cross cutting or driving has been done."
3. Warden's reports, SAA 790/1903/83. As early as February there was talk of companies taking over some blocks, and by June rights of purchase options had been taken out. Other mines were flooded, so little work was done at the Range.
4. Telegram from Warden Gee, SAA 790/1903/476.
5. 1903/476. On July 21st Gee wrote expecting the deal to be put through any day; on July 27th a telegram announced the deal was off.
6. 1903/446, September 28th..."only about half a dozen people are living now at the township site."

and at Arltunga generally, and some forty or so miners remained at Winnecke's Depot, but this was the beginning of the slow decline of the fields. To add to the problems, Henry Luce died in late December, and it took almost two years to unravel his affairs and auction his claims. This meant that no new tributers could work the White Range, White Range Extended or White Range Boulder, although the established tributers could continue.[1]

The Warden's reports continued to express satisfaction (and Mueller was back in charge, Gee having left in November 1903), but the reports of the battery manager were gloomier. Men were put off, and the battery was unable to work full time, though the ore that was worked contained a higher proportion of gold.[2] The Inspector of Mines, W. H. Matthews visited the goldfield in 1905, largely to look at the White Range area. His report agreed with all the reports and inspections already carried out - gold had to be proved to a much greater depth and then capital poured in to develop the reefs properly.[3] At the time of his visit 26 men were working on the White Range, another six on the outside claims and eight men on the alluvial. Despite this there was enough interest in the Winnecke's Depot field to encourage the New Coorong Mining Company to bring up a battery, which began crushing in May, 1905.[4] Several claim-owners had stayed on the field, wanting to crush ore but finding

---

1. Reported by Manager and Warden - also letter from J. Sutherland SAA 790.1904.105.
2. Manager's reports, 1904/37
3. W. H. Matthew - Report on the MacDonald Ranges Mining District, 1905 AA(D) U1-4 and Report on Arltunga and Winnecke's Goldfields (U1-6). He visited in July and August, and according to Plummer he made the visit to decide how useful extension to the railway from Oodnadatta would be. Plummers Mining Notes, September 1905, vol.1.
4. Mentioned in the Manager's report of May 1st, 1905/8. This affected the running of the Arltunga battery, which had crushed Winnecke ore up until then. Also 1905/170 - difficulties getting the boiler up. Plummer, October 4th, 1904, "battery expected very shortly", Mining Notes Vol. 1. Jenkins, Min. N.T. The N.T. of SA, its development p.5 mentions government assisting Company up to £2,000 to get battery.

the costs of carting to Arltunga too high, but the new battery proved a mixed blessing - it had almost run the well dry in June, and was able to work only for short periods.[1] There may have been about sixty men still at Winnecke's, because in August there was a small rush from there to an alluvial find at White's Gully, Arltunga.[2] Neither the warden nor the manager thought the find significant or lasting, and less than half the men made good wages. Both these occurrences affected the working of the Arltunga battery; in November the manager complained that too many men had left their claim for the alluvial.[3] By January, 1904 the alluvial "is nearly worked out and miners are returning to the reefs... a good number never having left the White Range".[4]

As the battery manager's work load decreased, so did that of the warden, and there were increasing complaints about Mueller's drunkenness and neglect.[5] He was dismissed in August 1906, and in September was being tried and convicted in the Port Augusta court;[6] Manager O'Grady took over his duties.[7]

---

1. Warden's report, June 20th, 1905/149.
2. 1905/464 - the first mention was from the Secretary of the Department, wiring to Battery Manager, so the rumours had reached Adelaide. A telegram from Bradshaw, postmaster at Alice Springs Telegraph Station mentions the numbers from Winnecke's Depot.
3. 1905/8, November 1st and 22nd. He blamed the "too frequent and often indiscriminate issue of 'exemptions' by the warden".
4. Warden's report January 31st, 1906/112.
5. Office memo from Matthews, September 6th, 1905. "I believe the Warden to be a thoroughly competent but unfortunately he indulges too freely and then neglects his duties. I recommend he be informed that complaints in regard to his intemperate habits and neglect of duty have been made to this Office and should any further complaints be received he will be dismissed without further notice."
6. Suprisingly enough, Mueller was up on a charge of embezzling public money, and got six months hard labour. The offence occurred back in the Winneckes rush days, 1902-3, and I haven't been able to discover why the delay in the prosecution occurred. The case was reported in the Port Augusta Despatch, on Friday November 30th, 1906.
7. 1906/499, 12th September. The Battery Manager, O'Grady took over as Warden on 17th August (1905/281).

The decline in the field's output was shown in the reports of the Government Resident: from over two thousand ounces of gold in 1903 to 784 in 1908.[1] The Commonwealth took over responsibility for the Northern Territory in 1911, and this coincided with another outbreak of bad feeling on the field, involving Manager O'Grady and his storekeeper friend, R. H. Lake against practically everyone else - the hotel keeper, policeman, miners and stockowners.[2] One letter from O'Grady in June, 1912, answering a complaint, said that "during my eight years here I've had the support and esteem of the whole of the mining community, but owing to a great decrease in population the mining industry had languished, and is now only second to Stock breeding". In October there was a complaint from the White Range miners, signed by only three men, H. Marshall, Thos Wilson and J. Hawkes, with another four miners mentioned.[3]

No direct action was taken, but O'Grady went on leave in 1913 and did not return. Mr. T. G. Oliver, sent to inspect the field, and the battery, in November 1913, was most unimpressed by the past management. He reported that "the whole thing seems to have been run on principles that would not have been tolerated for more that a month by any private company".[4] At that time

---

1. Government Resident's Reports on the Northern Territory.
   1903 2,212 oz gold, value £8,265.14.9
   1904 1,1821 oz valued £6,859
   1905 1,114 oz gold value £4,146
   1906 1,079 oz value £3,971
   1907 993 oz gold value £3,302
   1908 784 oz valued £2,847
   Interestingly enough, in 1909 the yield had increased to 1,034½ oz, valued at £3,758.
2. AA(C) CRS A3 NT 12/1282, AA(D) NTRS 27 and F141. In 1902 Lake complainedabout a Larry Rosenbaum over a pastoral lease at Claraville.
3. Letter from O'Grady, 6 June 1912. (AA(D)) F141) The White Range miners were complaining about the erratic results from crushings, and worried about O'Grady's friendship with Lake. O'Grady's reply on December 5th pointed out that the miners mentioned were all heavily in debt to Lake, and had either been up before the local court, or were being summonsed.
4. Oliver, T. G. Report on the Batteries and Mines of the N.T., 1913. Losses between 1911 and 1913 came to £3,776.4.11.

only five men were working alluvial at Arltunga and two near Winnecke's' there was work being done on the reefs. Although the White Range was deserted, he joined the long line of inspectors who realised its potential, but pointed out the necessity of improved access and lower freight costs.

The Acting Warden, Mr. F. Cavenagh, took over the running of the battery on the strict understanding that all costs had to be met by the customer. By this time all commercial enterprises were well established at the Cross Roads, or Township area. The licence for the White Range store was not renewed after 1912, and the Paddy's Hole store stopped operating about 1913.[1]

There was very little activity on the field for several years, despite suggestions that the extension of the railway, even to Alice Springs, would open up the area once more.[2] In 1921 a Mr. E. H. White bought sixteen leases at White Range, and retained control over them until the Second World War.[3] In 1923 there were "only a handful of prospectors scratching around the hills"[4] and the police constable was in charge of the battery.[5] During the 1930's there was some resurgence of interest in Arltunga and Winnecke's Depot fields, no doubt encouraged by the Depression, A Mr. H. Jenkins had several leases and worked a small mill near Claraville, between 1934 and 1937.[6] His discovery of payable gold encouraged a small

---

1. Book of Registrations, Business Sites and Licences, AA(D).
2. Waldron, J. J. Central Australia. 1916.
3. Extracts from Administrator's Reports, 1921, 1934, 1938, held at the Mines Branch, Darwin.
4. Ford, M. Beyond the Furthest Fences, p.59. Larry Rosenbaum ran the store, having taken over from Joe Woodford.
5. Hossfeld, P. S. The White Range Goldfield, Eastern MacDonnell Ranges District. 1937.
6. Registration of Machinery sites, AA(D), 18/12/1934; Administrator's Reports 1935-37; AA(D) file 39/50M, Correspondence with the Warden, Alice Springs. Holdings struck out 6/7/37

rush in 1935, and revived interest in the White Range - some tunnelling and digging was done in the area of the old White Range Excelsior and White Range blocks. There was not enough reef gold to keep the battery going, and in 1936 it was sold.[1] Prospectors were still keen to investigate, and interest was shown in the old Wheal Fortune mine, and Winnecke's Depot.[2] One Jim Marshall tried to make a living on the alluvial from White Range about 1938, and in 1940 Thomas Coppock, with his family, brought a two head stamper to the Range.[3]

During the Second World War, the Roman Catholic Little Flower Mission moved from Alice Springs to Arltunga. The Mission looked after some 180 aborigines, and the move was "prompted by a desire to provide a more healthy rural environment for inmates ... of whom 121 are women and children."[4] The move took place during September 1942, to an area south of the Cross Roads, but there were problems, particularly with the well. Not only did it take some time to reach a good supply of water, but the aborigines were inexperienced well sinkers. However, the Mission gradually organised the necessary buildings and water was found, but in 1953 it was moved to its present site at Santa Theresa, south-east of Alice Springs. Since then there has been very little activity at Arltunga, apart from the occasional prospector, a small rush in 1962 and ever increasing number of tourists.

---

1. First to Mr. Rudolph Schmidt, then to L. Garland, then to C. Chapman who took the ten head stampers to the Granites. Letter from Acting Mining Registrar, Alice Springs, 14th August, 1940. AA(D) F143.
2. Ibid, letters of 22/12/37 and 10/8/38.
3. Application from Marshall, 6/10/38, and report by Constable Sheriden 2/1/39, ibid; Lee and Casey mentioned as prospectors. Coppock's name appeared in the Register of Machinery Sites, 13/4/1940. AA(D).
4. AA(D) F1, 42/259, letter of 10th July. Other letters refer to the Dept. of Native Affairs' requesting the Mission to leave Alice Springs. The major problem seemed to be the number of servicemen stationed in the town.

DETAILS OF SOCIAL CONDITIONS

This second part is an attempt to discover, from the documentary evidence, what sort of problems faced the miners. Most of the subjects have been mentioned in the general history, but are given a fuller treatment below. It was hoped that details from the written sources would relate to the information found during excavation, and some hopes were realised.

ACCESS

The isolation of the Arltunga goldfield was the first problem to face the prospective miner, and remained one of the great deterrents to development. The road was usually bad and often impassable, mail services were infrequent and slow, and freight charges could double the cost of stores on the field. The road followed the Overland Telegraph Line, and the wells sunk during its construction in 1871-72. As early as January 1886 an editorial in the Port Augusta Despatch pointed out the difficulty of prospecting the Centre, and recommended that the South Australian Government should sponsor parties.[1] The Government did not take up this idea until 1891, and in the meantime some hundreds of men had made their own laborious way up and down the Line to Arltunga. From the railhead at Oodnadatta, the trip took a week at the best of times.

Once the mail service was established, by 1891, it was possible to get to the field by mail coach. The single fare was £7 from Oodnadatta to Alice Springs, and another £2 to Arltunga; with the train fare of £3.11.9d, second class, from Adelaide, it was an expensive trip.[2] Warden Mueller, returning to the field after sick leave in 1903 came back by coach, and justified this by reporting that ".. a man who started five days before the mail, with spare horses, was overtaken by us 60 miles south of Alice Springs."[3] Warden Gee, who acted as senior Warden during 1903 took 21 days to reach Arltunga from Adelaide. In 1890 a deputation had called on the Minister asking for improvements to the water supply and mail service, and suggested a new

---

1. Port Augusta Despatch, January 18th.
2. Frearson, Robert. Guide and Handbook to the Arltunga and Winnecke's Depot Goldfields 1903.
3. SAA 790/1903/485; Warden Mueller did have a cold, too. For Warden Gee's trip, see SAA 790/1903/83, and 1903/168 for his travelling expenses of £15.

route from Alice Well which would cut off one hundred miles. Nothing was done about the road, but another complaint in 1895 by Joseph Harding, storekeeper, did effect some improvement. He complained about the cutting through Ooraminna Gap, put in in 1888:

> "For a single horse or cart it is right enough but for my teams, it is almost impossible to get a string of horses up or down, in fact my waggons have been damaged each time they come up loaded. ...My team are going down for loading now to Oodnadatta. If this cutting is made straight during March or April, it will save my horses 70 miles on return journey...."

This time the work was done, over ten days in April, with Postmaster Gillen reporting on it as "a thorough good job."[1]

There were still major problems when the machinery for the new Battery and Cyanide Works was sent up to Arltunga. The contractor, Mr. E. H. Sargent described "the track" as in "very bad condition for carting." In February, the Manager Mr. Woolcock, who had taken four weeks to travel from Oodnadatta to Arltunga with ten men and two tons of equipment, mentioned the Sargent "had to form the road himself to prevent his load upsetting", along the way.[2] Again, in 1901 when a new boiler was sent up, wide detours had to be made because of the "bad state of the road".[3] Repairs were carried out on the Arltunga road, in the Bitter Springs area, so that the new boiler could travel safely.[4] In 1903 an Adelaide firm, W. R. Cave & Company took three 100 gallon and four 200 gallon tanks to the field, "hoping to assist development there..." The trip up was so disastrous that the Company offered the tanks to the Battery; the Department would not buy them, but agreed to store them. Cave and Co. did not want to risk a return trip.[5]

---

1. SAA 790/1895/111, letter from Harding dated 26th February. Gillen's memo of 30th April mentioned the cost as £7/10/-
2. SAA 790/1896/456, report by Sargent dated March 8th, 1897; Manager's report Feb. 10th, 1897/83.
3. SAA 790/1901/524.
4. SAA 790/1902/112
5. Correspondence between W. R. Cave & Co. and the Department of the Northern Territory, between September and December, 1903. SAA 790/1903/527.

Roads within the goldfield were not much better, and there were many references to rain making the roads impassable. In July 1898 the Battery Manager reported the tracks as too rough for teams to cart. The White Range people in particular suffered from a bad track, which is still difficult today. In August 1905 some 37 Arltunga residents petitioned the Minister about the state of the White Range road, pointing out that the White Range produced most of the stone for the Government Works, and was vital to the prosperity of the area. Even this delicate hint got no response from the Minister.[1]

WATER

Once on the field, apart from finding an area to prospect, the greatest difficulty was to make sure of a good water supply. The first miners were established around the only permanent water, Paddy's Rock Hole, which could not cope with the suddenly increased demand. As early as June, 1888 it was reported that Paddy's Hole was "practically deserted because of the absence of water".[2] By September the Warden allowed between three and six months suspension of work because of the lack of water and capital.[3] The Government Geologist, Mr. H. Y. L. Brown, made the first of many visits to the field in that year. He found very few working, due to the water shortage, and described how the water was used: "Some of the washdirt (is) carted by the diggers to Paddy's Rock Hole Well, and is treated in three troughs and sometimes it is cradled. Water is also carted to the claims".[4]

The first well was sunk at Claraville by the end of 1888, and the second at Paddy's Hole in early 1890, by the Government well sinking party.[5] Neither well was a great success, both

---

1. Petition dated August 4th, 1905.
2. SAA 790/1888/914.
3. SAA 790/1888/949, September 9th. There was no machinery on the field which might have made work easier.
4. Brown, H. Y. L., Report on a Journey from Adelaide to Hale River, 1888.
5. Letter from Edmund E. Parke, of the Wheal Fortune mine, October 17th. SAA 790/1889/914.

being deepened in 1890, and a private well was sunk on the Hale River to add to the supply.[1] Three mills were using the wells by January, 1890, but two at least had stopped by February because the wells could not supply enough water.[2] In 1891 another well was sunk near the Wheal Fortune mine, but this was a little out of the way for most miners. As the population increased, the miners had to spread out, and a new well was needed north west of Paddy's Hole. The Star of the North was put down between June and December, 1892, making 500 gallons a day - "good, as the creeks haven't run for three years".[3]

There were considerable difficulties encountered during the sinking of the Star of the North. The contractors were Stone and Warman who tendered at 27/- per foot for the first fifty feet, 35/- for the second, 40/- for the third, and 50/- for the fourth. The Warden's report of August detailed the problems:

> On 4th, down 50 feet in very hard rock.... I am afraid the Contractors will never be able to complete the work at the remarkably low price ... not enough to pay men's wages, rations and ammunition used in sinking. They have to pay 4/- per lb. for dynamite, and are using a lot....

The contract was completed at 69 feet, and the Warden suggested that a bonus be paid as the contractors were in financial difficulties. The Minister was prepared to consider this, but there is no record of a bonus being paid.

This well was taken over by the Government Battery and Cyanide Works when it was finally established, to the exclusion of all other users. Another well was needed, fairly close by, and during 1898 Samuel Olsen sunk one at Kangaroo Creek, half a mile south-east of the Star of the North.[4] At a depth of 76 feet

---

1. Letter from Edmund E. Parke, of the Wheal Fortune mine, October 17th. SAA 790/1889/914.
2. Report by S. Dyke, head of well sinking party, SAA 790/1890/165.
3. Report by the Warden, August 13th, SAA 790/1892/118.
4. SAA 790/1897/495.

the well made 1,700 gallons - one fo the best suppliers on the field. In the meantime, it had become necessary to augment the water supply between Arltunga and Alice Springs, as the journey between the two places could take two or three days. The natural water supply at Bitter Springs was, as the name implies, not very drinkable, and tenders were called for Wurlies Well in December 1896.[1]

Warden Mueller decided to accept the second lowest tender, hoping to avoid financial problems suffered by the Star of the North Contractors. This did not please the Department or the lowest tenderer, Thomas Williams, who accused Mueller of drunkenness and favouritism.[2] Unfortunately Mueller had already signed the contract with William Russell, the second lowest tenderer, but the Department would not accept this, and Williams began sinking the well in January, 1897, completing the contract in April.

In August 1896 the Warden asked the Department to supply buckets and ropes for the Government wells. "Hitherto the small community here have been using their own property for the purpose when required, but this ceases when many parties require the use of the same well to work their respective claims ..."[3] He asked for at least 6 buckets and 300 feet of rope for the four wells (Arltunga or Paddy's Hole, Star of the North, Wheal Fortune and Claraville) plus spares. He estimated the cost at £8, using 8 gallon capacity iron buckets, but it took some time for the Department to implement the request. When the items did arrive in August 1897, some of the buckets had been involved in the fire at Oodnadatta in January, 1897, and were leaky.[4] Replacements were sent up in February.

---

1. SAA 790/1896/37. In January J. H. Lloyd complained about the supply, he had "recently (come) over this track with 11 horses and we had no water from 4 o'clock one day until nearly 4 o'clock the next".
2. SAA 790/1896/546.
3. SAA 790/1896/389.
4. SAA 790/1897/459.

Just as the well and water supply situation appeared to be satisfactory, the reef gold at the White Range was discovered. By May, 1898, the claimholders were petitioning for a well, as they had to cart water 6 miles, over very rough country.[1] The Department was cautious about spending money on such a new area, and it was not until January 1899 that tenders were received, Sam Olsen winning the contract. By April 24th the well was 50 feet deep, but yielded only 40 gallons a day. The next 50 feet brought no increase, and Warden Mueller suggested the work continue, even though "miners don't like wells over 100 feet" deep. At 145 feet the supply improved to about 120 gallons a day, "which would, with careful useage, supply the present number of men with water for domestic purposes ..." The contract was completed in October 1899.[2]

The drought of 1900, plus extra men at the White Range put too great a strain on the well, and in June Louis Schaber contracted to deepen it.[3] The Warden had mentioned in April that the tenders were high, probably because Olsen "lost heavily" on his contract, the rock being so very hard. By August Schaber had sunk another 25½ feet, without any increase in water supply, so put in a drive of 25 feet. This was finished by September 14th, again without any improvement in supply, though in October the Warden thought it provided sufficient water for domestic purposes.

This was not very satisfactory for the White Range community, and during Mr. Geologist Brown's visit in May 1902, he was asked to select a site for another well, closer to the mines. It took some time to convince the Minister that the well was necessary, but the tender of John Byrne was accepted in July 1902. On 23rdJuly, Warden Mueller, in a report to the Department, pointed out the difficulties facing contractors:[4]

---

1. SAA 790/1898/258. There were 31 signatures to the petition, quite a concentration of men.
2. Ibid, further correspondence. In July the Warden mentioned 80 on the White Range.
3. Ibid, 23rd March, and report October 1900, SAA 790/1900/460 that Arltunga and Kangaroo Creek wells were watering all the stock and most of the miners on the field.
4. SAA 790/1902/228.

> "... I know of but one instance where the Contractors have done well, all workers were partners and worked from morning till night, combined with good luck. Others scarcely made ordinary wages, and some not that, as labour had to be hired. Wages at least 12/- per day for well sinking and then the work is not carried out so energetically".

By August Byrne was down 50 feet but struggling because of the hard rock and lack of labour. In November he transferred the contract to the storekeeper, John Wilson, but evidently continued working on the well because in January he died, apparently "from a chill caught when coming out of the well over-heated".[1] By February Wilson had decided that he could not afford to continue with the contract, so after much correspondence and delay, fresh tenders were called in October, 1903. The new contractors, Sutherland and McKillop began in November, and by December 1904 they had completed the second 100 feet. By now Sutherland had taken over McKillop's share, and was keen to continue the work, despite having lost "£40 on the present contract, with two workmen, stores and explosives".[2] His offer, at £7 per foot, was far too high, and the new contract went to Dupon and Schaber, at £6 per foot, in February, 1905. In June the well was 250 feet deep and still dry. No further work was done, and the lack of water at the White Range was as much a deterrent to its development as the lack of capital.

The last well on the field was sunk at the township site. It was begun privately, by Thomas Wardle, in 1905, but he could afford only the first thirty feet. The Warden reported favourably on the site as central for any business or residential blocks, and close to White Range where supplies were very low.[3] The well was continued at Government expense, and at 62 feet a good supply of 400 gallons per day was struck. When in May 1907 a horse fell down the well and "£2 (was) expended on cutting up and removing the carcase", the Warden asked that a fence be

---

1. Ibid, report by the Warden in February, 1903.
2. Ibid, report by the Warden, December, 1904 The tender had been £4/19/- per foot.
3. SAA 790/1905/292. Wardle was a storekeeper.

erected around the well, which was approved.[1] One other request for a well was made in 1905, by residents of White's Gully, east of Paddy's Hole. The twenty-eight men working there "each contribute 4/- per week for domestic water", which had to be carted.[2] Although the area had been worked for alluvial gold for two years, and experienced a brief rush at the end of 1905, no reefs had been worked, and the Minister was not prepared to spend any more money.

SUPPLIES

Past Oodnadatta, en route for the goldfield, there were stores available at Horseshoe Bend, Bloods Creek and Anna's Well. Some of the well off parties equipped themselves in Adelaide or Oodnadatta, the more experienced travellers preferring the latter. As H. V. Barclay said, "Messrs. Manfield & Co.'s long expertise of bush requirements (enabled) them to stock the class of goods suitable ..."[3] On the field, in the very early days, the nearest place for stores was Alice Springs, some 70 miles away - Mounted Constable Hillier mentioned in his report in December 1887 that men came to Undoolya (the station property closest to Alice Springs) for meat, and Alice Springs for mail. He also reported the appearance of a man named Palmer "with no less than fourteen camels, all loaded with intoxicants".[4] Palmer and his partner Stanley, came to Alice Springs about Christmas time every year, and no doubt thought they would make great profits with the additional mining population.

As the interest shifted to Paddy's Hole, and payable gold was found, business men moved in. Brown mentioned two storekeeper/butchers at Paddy's Hole in 1888, but the first official slaughtering licence was issued to Joseph Harding in September, 1890.[5]

---

1. SAA 790/1907/276, report by the Warden, 4th May.
2. SAA 790/1905/458. The petition was signed by 42 men, and said up to 60 had worked in the area, and £250 had been spent on water in the last year.
3. Barclay, H. V. Explorations in the Northern Territory 1878-1909, referring to his 1904 expedition.
4. SAA 790/1888/121.
5. SAA GRG Northern Licencing Bench, Licences, usually including sale of alcohol were listed here and another book of Registration of Licences, now in Darwin, contains quite different names, i.e. John Wilson T. Wardle etc. Chas South, T. A. & F. B. Wallis are the only names appearing in both.

Harding had been on the field for some months at least - he signed a petition opposing an application for a publican's permit, in May. This application, made by William Benstead, already established in Alice Springs, was approved by the Warden as a deterrent to sly grog selling; it is quite possible that Harding may have been involved in this very lucrative side line. Although Harding was not registered as having a Storekeeper's Licence, at least from Port Augusta, it is obvious from the spasmodic, occasionally acrimonious correspondence with the Department of the Minister for the Northern Territory that he was involved in several business enterprises on the goldfield. Warden South in 1892 describes him as storekeeper, and mail contractor, who needed to keep several horses for his business.[1]

There were two other licences for slaughtering granted in the early 1890's, one to D. Oliver at Claraville and the other to Edward Prosser at Paddy's Hole, and it seems likely that they carried out some storekeeping too.[2] Certainly the warden thought there sufficient publicans and storekeepers on the field in 1891 when he successfully opposed the granting of a licence to Frank Blackmore Wallis.[3] This did not stop Wallis, already established in Alice Springs - he finally began operations from Claraville in 1894.[4]

Although the storekeepers held positions of some power, they did face problems in 1894; Harding, the lessee of the Paddy's Hole well complained about the rent of £10:

---

1. SAA 790/1892/401.
2. SAA GRG 7. Oliver held his licence for two years from 1890, and Prosser for the same time from 1891. Other licences were granted in 1893 and 1897.
3. SAA 790/1891/387. Wallis had two convictions against him for illegal trading.
4. SAA GRG 7.

> ...Ever since the start of theses diggings it (the well) has been, with one or two exceptions, the rendezvous of unemployed men who not only have to be supplied with water for their horse, but my books will show with rations. I have assisted men with rations and tools and the use of my teams (to try and procure for them a living and help along the development of this field) to the tune of over £1,000 and in no case have I ever received a penny for water as the diggers are too poor...1

Twelve years later the White Range storekeeper, John Wilson, was asking that a Local Court be established at Arltunga, to save the time and expense of going to Alice Springs:

> "The credit necessarily given here in order to keep the population is very great. That all men are either working their own shows or tributors, which amounts to the same thing demand a much larger credit than would be necessary if work could be had for Wages. ...Therefore the men here are raising stone for Treatment and have to be supported till they can get a crushing and if that pans out badly when treated they must be kept going till they can get out another parcel. If all men were honest we need not worry but as it is if a man is a crook and in debt he simply if he has any horses clears out".2

Manager O'Grady agreed, and the local court was established in 1907.

The isolation of the field ensured that the cost of goods was high, and everyone associated with it re-iterated the necessity for plenty of cash. Brown's 1888 report mentioned that 20/- to 25/- per week was necessary[3], and this remained the average cost of living throughout the main period of occupation. A report in the Observer, on May 14th 1889 said that most of the prospectors kept themselves by working on the surrounding stations. "Very few, if any ... made wages..." although a group of six men "earned about 10/- per week and'tucker'". Fresh meat was a luxury on the goldfield - the lack of water, and often the lack of feed, made it difficult to keep stock, and the surrounding stations were not keen to supply the miners.

---

1. SAA 790/1892/401, op cit.
2. SAA 790/1907/156. Letter of November, 1906.
3. Brown, H. Y. L., op cit.

This did not stop a certain amount of illegal activity, and was one of the reasons behind requests for a permanent police camp of Arltunga.[1]

During the drought of 1900, storekeeper Harding decided to raise the price of fresh beef from 3d. to 4d. a pound, and the other storekeeper Wallis agreed to do the same. Partly as a result of this rise, and partly becuase of bad feeling between Harding and the Battery men, the Manager asked if they could run 50 goats on the Government Reserve around the Battery, to improve their diet. At the same time the men transferred their custom from Harding to Wallis, much to the former's disgust.[2] Apparently in retaliation, Harding tried to run his 350 goats on the Government Reserve, but was forced to desist under threat of police action, which "gave great satisfaction to the Government staff."[3] Harding then tried to get rid of the 50 goats by organising a petition amongst the miners, on the grounds that the goats would affect the water supply. The Manager took great pleasure in answering the several points of the petition, especially pointing out that the goats drank less than 7 gallons of water per day, a very minor amount when measured against the 1,000 gallons or more consumed by the mill.[4]

In January, 1902, before the discovery of rich gold at Winnecke's Depot, the Warden reported that "It was necessary to check the influx of men without the means to buy tools, rations, etc. ..."[5] Robert Frearson visited Arltunga and

---

1. SAA 790/1898/365. The subject is discussed in the general history section, p. 7.
2. SAA 790/1900/306, and 468 for Harding's reaction.
3. SAA 790/1900/306, letter of July 20th from the Manager.
4. Ibid, petition of July 17th and Manager's reply.
5. SAA 790/1902/77, January report. This was necessary because the Battery had to close down until the arrival of the new boiler, there was no wages work, and advances on ore from untried ground would have been hard to assess.



Copy of Govt. Battery requisition for provisions for six months from July, 1897.

Winnecke's in 1903 and found provisions 50% to 100% dearer in Adelaide. His Guide listed available foodstuffs and prices:

> "Flour, 200 lbs, 50/-; Meat, salt 5d. per lb; Meat, tinned, assorted, 2/- a tin; Jam, 1/3d tin; Tea 2/- lb; Preserved Fruits 2/- tin; Herrings 1/3 tin; Sugar 4d. lb; Salt 4d lb; Biscuits 1/- lb; Pickles 1/6 bottle; Tomato sauce 1/3 bottle Sardine, small size, 1/- per tin; Marmalade 1/6 tin, Kippered Herrings 2/- tin; Leibig Extract 2/-".[1]

The Battery Manager sent in a requisition for Provisions for the staff, for the six months ending January 1st, 1898, in May 1897 - allowing "ample time to have the goods forwarded so that they may arrive here by the end of July, when they will be required."[2] He referred to the flour available on the field as "of a very inferior quality", and suggested that such stores could be purchased as Port Augusta, thus saving on freight. This suggestion was not carried out: the food cost £92/13/9 and the cartage another £82/19/9, from Adelaide, and took a month to get from Oodnadatta to the Works.

Times of drought made it very difficult to keep up the supplies, especially as not all the storekeepers used camels. Harding refers only to horseteams, but camel teams must have brought supplies, certainly to Alice Springs if not so frequently to Arltunga. In Frearson's Guide there are two advertisments about the use of camels: Mrs. Bagot had camel teams leaving weekly from Oodnadatta for the Arltunga Goldfields, and F. B. Wallis of the MacDonnell Range General Store provided horses and camels for hire, as well as Mining Requisites, Provisions and General Ironmongery. This was the boom period of the field 1903, with hundreds of men trying their luck at Winnecke's Depot, and anxious to get to the gold as quickly as possible.

The rush to Winnecke's Depot also attracted more business men, to Winnecke's and to Arltunga. Those miners doing well at White Range and Arltunga tended to stay with their claims, with the White Range the centre of attention in the winter of

---

1. Frearson, Robert F., op cit.
2. SAA 790/1897/214.

1903. This interest encouraged the development of the "Township" site, at the Cross Roads, where the roads from Paddy's Hole, the Battery, Claraville and the White Range met. Although the White Range deal fell through, the potential of the Township area had been realised. In the rush year of 1903 there were several applications to the Port Augusta Licensing Bench for hotel licences at Winnecke's Depot, the Township area and the White Range. Not one of these got beyond the planning stage before the rush was over, and interest in Arltunga waned. The only slightly successful venture was that of Patrick O'Neil, who held a licence for a billiard table, from September 1903 for one year.[1] Charles South, who built a store at Kangaroo Creek well which was taken over as the Police Station applied for a licence to sell alcohol near the White Range in May 1903. There was no further mention of this application, but he was successful in 1906, over a similar matter,[2] and was probably at the Township. Henry Clark may have run a store in 1903 but does not appear on any register. Warden Gee referred to a storekeeper "lately arrived from the New Guinea Goldfields", but does not name him.[3] Thomas Wardle had settled there by April 1905 and remained until early 1908. It was about this time, as the goldfield was slowly winding down, that the Township area became the real centre.

The Wallises, who had run the Claraville store since 1894, moved to the Township in 1907 and remained there until 1916.[4] Sandy McDonald, who held a store and slaughtering licence at Winnecke's Depot from 1904 to 1910, opened the Glencoe Hotel at the Township in September, 1910. Joseph Harding had left Paddy's Hole in 1903, but his store was taken over by Fritz Klau, who continued until 1913. The White Range store continued until 1913. The White Range store continued under

---

1. SAA GRG 7, op cit. That this application was successful became important during the excavation at the White Range.
2. SAA 790/1903/251, and Ibid. South ran a store in Stuart (now Alice Springs) from 1893 until 1910.
3. SAA 790/1903/83, March Two sites secured by Adelaide firms, the rest locally.
4. AA(D) Registration of Business Sites and Licences.

John Wilson, until 1911; for another two years after that Frances Bignell held the licence, but there were no more than two or three miners at the most on the rich reef claims of the Range. Others appeared in the Township, but the field was slowly dying, and there were few rewards for the storekeeper and publican,[1]

CLIMATE

The three great problems of the goldfield were lack of water, lack of capital and a hot dry climate. The water supply was helped by the successful sinking of wells in most parts of the field, but the wells were affected in the drought years. No doubt the climate was one of the factors in discouraging capital, along with the isolation and uncertainty about the depth of gold. Very little could be done to negate the effects of extremes of heat, sudden and heavy rain, and long periods of drought. The lack of surface water, apart from Paddy's Rockhole, got the goldfield off to a very shaky start, and the search for gold was soon followed by requests for wells. The scarcity of water on theeastern, and richest, side of the White Range was an obvious deterrent to development.

The Government Geologist, H. Y. L. Brown, on his first visit in 1888 found "very few men on the field owing to want of water".[2] In May 1890 the Warden reported good rains, but most of the surface water had gone by June.[3] The dry climate encouraged the use of dry-blowers, but when they arrived in the winter of 1895, there was just enough drizzling rain to keep the soil too moist for their use, at first.[4] The private mills, operating

---

1. Foregoing information from both registers. Other names mentioned in the Darwin Register include R. H. Lake, 1910 to 1915, J. Baker in 1910, Turner, 1914-18 (with Sandy McDonald) J. Woodford in 1919, and L. Rosenbaum 1923-29.
2. Brown, H. Y. L., 1888 op cit.
3. SAA 790/1890/344 and 294.
4. SAA 790/1895/289 - Warden's report in July.

from 1890 until the Government Battery was opened in 1898, depended on a good water supply, not always forthcoming. In 1896 heavy rain during the summer flooded the Hale River, "securing at least 18 months supply for the Huntingdon Mill".[1]

When the news became public that the Government was to send up a public battery to Arltunga, there was a renewed interest in the field, and many arrivals. Unfortunately, the winter of 1897 was very dry, which affected men and stock, and by the spring of 1898 "alluvial digging was at a standstill".[2] Fortunately reef mining was on the increase, as the Battery had been working since February, and any miner dependent on alluvial would have been able to get employment on a reef claim. The dry weather continued, until by November 1899, the Warden considered it to be the worst year since the discovery of gold in 1887. The Battery Manager recorded temperatures of 102 to 107 F in the office, the coolest of the battery buildings.[3] The summer contined to be hot and dry, and in February 1900, after 34 days of 100 to 114 temperatures, a cool change "spoilt all chance of a thunderstorm".[4]

This drought brought the field almost to a standstill, as horseteams were unable to cart ore because of the lack of feed. It caused tremendous problems for the authrotities: the Battery Manager wanted to keep the Battery going as ore was being produced, and the Government could not afford to have the Battery employees idle. He suggested that camels be used to cart the ore,[5] but this provoked a strong reaction from Joseph Harding, storekeeper and owner of a horseteam. Harding did not want to lose the income from cartage, and was able to rally a lot of support through his position as storekeeper and creditor of many of the men. The Warden supported the miners

---

1. SAA 790/1896/16 - Warden's report, January 28th. The Huntingdon Mill worked much longer than the other two mills, which may have been abandoned by 1891.
2. SAA 790/1897/84 and 1898/46.
3. SAA 790/1900/7 temperatures recorded in November, 1899.
4. Ibid.
5. SAA 790/1900/308 Ibid, reports of May and June.

by allowing work exemptions if the ore could not be carted by horseteams, until directed by the Minister not to do so.[1] Enough rain fell in September to enable the horse teams to get back to work, and the crisis was averted.

Really good rains did not come until January 1901, and then "to some extent retarded work on the mines, including the cartage of stone raised, portions of some stacks having been washed away and workings repeatedly flooded".[2] Other rains in 1903 and 1904 had a similar effect, flooding mines and making roads impassable. The drought of 1900 was the worst experienced during the main mining period, but rapid changes from one extreme to another were common. By the end of 1904 "bushfires (had) been plentiful, burning many miles of the field at times endangering the camps."[3]

The extreme of temperatures in winter could be quite a problem. Warden Gee noted in his diary on May 1st, 1903 that it was "a very cold and bleak day."[4] During 1907 the police constable, as Health Officer reported that Europeans and Aborigines were suffering from colds.[5] In subsequent winters the Aborigines particularly were prone to influenza and colds. This may have been partly due to the decline in mining and possible employment for the Aborigines, leaving them without a regular supply of food.

The summer heat caused problems when anyone died. In January 1904, a Mr. J. Sutherland, J.P. wrote to the Department about the death of H. E. Luce on November 19th. Luce was found dead in the morning, and Sutherland and the constable, Nalty were informed. Nalty had not come to see the body by 11 a.m., so Sutherland "taking into consideration the hot weather ... and the state of the body ... decided to give a certificate to bury".[6]

---

1. SAA 790/1900/386.
2. SAA 790/1901/58, Warden's report in March.
3. SAA 790/1903/85, 1904/45
4. SAA 577, Handwritten diary kept by Gee in 1903.
5. Reports of the Health Officer, SAA 790/1907/28
6. Letter from Sutherland, 30th January, 1904, SAA 1904/105.

POPULATION AND PERSONALITIES

There were three groups of people on the goldfield: those employed by the Government, the miners, and the small but influential group of storekeepers, so very necessary to the wellbeing of all. The Government employees had certain powers, as well as the privilege of a regular income, and included the warden, the police constables and the manager and employees of the Government Battery and Cyanide Works. In general there was little community feeling despite the difficulties that everyone had to cope with, and most of the tensions and personal problems have been mentioned already.

The first official appointment was that of warden, absolutely necessary to the operation of the goldfield.

From 1887 until 1894, the Warden's duties were carried out by constables stationed at Alice Springs. In the very early days, when the ruby rush began which lead to the discovery of gold, the lack of knowledge on mining matters caused considerable confusion. MC Willshire was appointed Warden in June 1887, and MC Hillier became acting Warden in July.[1] Neither enjoyed the extra task, and MC South became Warden in 1888,[2] and did most of the work in the next six years. As the population on the goldfield and elsewhere in the district increased, so the problems of combining warden and police duties became too difficult. South recommended the appointment of J. F. Mueller, who may have been at Arltunga since 1887.[3]

Mueller seemed to carry out his duties reasonably well for little reward. His salary in 1895 was £100 per annum, which was soon found to be insufficient. In March 1896 he asked for an increase to £150, and as the Department took no notice, Mueller was forced to plead his cause in detail:

---

1. SAA 790/1887/512 and 923.
2. SAA 790/1888/169. Hillier continued as assistant Warden.
3. See page 4 of the general history.

> "... Owing to my stipend being so small I have hitherto done some other work where practicalbe without interfering with my Warden's duties, but this I shall have to discontinue, as Mining Operations increase,.... To enable me to carry out my duties I have to employ a blackboy in order to keep my horses within reach at all times, this invloves clothes and rations for him, and the increase of provisions owing to the drought is already in evidence. Horse shoeing is also an expensive item, from 8/- to 9/- is charged ..... In order to meet these necessary expenses I have alreadybeen obliged to make use of private resources...."[1]

It was only in January 1899 that he received an increase of £20 a year. By 1901, the increased pressure of work encouraged Mueller to ask for another rise in pay, as his "remuneration is still considerably less than any labourers wage on the field".[2] This was bad for his image on the field, as one of the Government appointed officers. The same argument, used in 1896, about the necessity of employing a blackboy, now full-time, and the high food costs were put forward again. The Department grudgingly allowed him another £10 per annum. Mueller must have hoped for more: although grateful for the increase, he wondered if he would be eligible for a food allowance such as the men at the Government Works received. The Department thought not.[3]

With the discovery of gold at Winnecke's Depot, the Department decided that the Warden's duties were not being carried out satisfactorily. Nothing was recorded in the correspondence files about disapproval of Mueller's shortcomings apart from occasional reports of drunkenness, and he kept his job, but L. C. E. Gee was appointed Senior Warden on £250 a year and ration allowance of 12/- per week.[4] Gee arrived at Arltunga on April 5th, 1903 and recorded in his diary that he found Mueller "rather drunk" and his camp an "unsavoury place".[5] However, when Mueller asked for sick leave in August, Warden Gee approved the application

---

1. SAA 790/1896/87, and 1895/184 for his original salary.
2. SAA 790/1901/523. He had filled the post for over 6 years.
3. SAA 790/1901/523. The increase was allowed from January, 1902.
4. SAA 790/1903/103, Gee appointed in February.
5. SAA 577. Gee also noted the presence of "black girls".

as Mueller had postponed taking leave in 1902 because of the press of business. "He has assisted me in my duties most loyally and is highly esteemed throughout the district", said Gee.[1]

Warden Gee may have had very good personaly reasons for publically praising his assistant as he had just asked permission to return to Adelaide. Winnecke's Depot was on the wane, the White Range was not going to be developed properly and one man could cope with the work. Mueller returned from his stint in hospital on December 6th, and Gee left Arltunga a few days later. No doubt Mueller hoped to retain some of the perks allowed to Gee, but this was not the case. He remained on his old salary level, with no food allowance, but after much correspondence was allowed to keep the extra horses bought by Gee and needed for the extra travelling to Winnecke's Depot. The Department had allowed Gee to employ a blackboy to look after the horses, but were not prepared to cover such expenses for Mueller. Finally, after much correspondence, another £20 was added to his salary to cover travelling expenses to Winnecke's Depot.[2]

After 1904 activity on the goldfield gradually slowed down, and correspondence between Warden and Department decreased. It is more than probable that the lack of work allowed Mueller to spend more time drinking; although there was no official reprimand, the Department found his work less satisfactory. Then, in August 1906, Mueller was sacked, and in November, in Port Augusta received six months hard labour for embezzling £42/9/1 some time in 1902 or 1903.[3] Very little information about the case appeared in the Departmental correspondence, but the Manager of the Government Works took over the warden's duties from August, 1906[4]. Despite all Mueller's hardships and

---

1. SAA 790/1903/485.
2. SAA 790/1904/103,278 and 341.
3. Report of the trial, Port Augusta Despatch November 30th, 1906. Mueller was 56, and the jury returned a verdict of guilty under extenuating circumstances, with a strong recommendation for mercy. Unfortunately there were no further details.
4. SAA 790/1905/281. The Manager's salary was increased from £275 to £320 p.a. to cover the extra work.

problems at Arltunga, he returned to the goldfield on leaving prison. An office memo noted a request from Mueller for the fare back to Arltunga; a second memo pointed out that the Sheriff provided a ticket home in such circumstances, which would get Mueller to Oodnadatta.[1] Nothing daunted, on his return, Mueller applied for and got a subsidy to prospect E.N.E. of Arltunga.[2] This was not successful as a gold finding expedition, and was the last reference to J. F. Mueller at Arltunga.

The next appointments were for the Government Battery; the men employed there received good wages and ration allowances, plus travelling expenses to and from Adelaide, if they stayed for at least one year. Wages ranged from £4 a week for the assayer/bookkeeper/storekeeper to 8/4 per day for a labourer, with the Manager on £4000 a year.[3] The first Manager, Woolcock, brought eleven men to Arltunga, but some were concerned only with the setting up of the plant and machinery. Once this task was completed most of the original staff returned to South Australia. The isolation and climate did not encourage long service on the field, and most men employed in the south remained for just their contract year. Whenever possible the manager employed suitable men already on the field. This was not always easy - in 1901 the Manager had great difficulty in finding a suitable cook, "owing to their incapacity as cooks, lack of cleanliness and unpunctuality'.[4]

Manager Woolcock stayed until September 1898 and was followed by E. L. Grundy for two years. H. B. Corbin took over as Acting Manager in September 1900, and was confirmed as Manager in November. He left in April 1903, and Grundy came back for another year, and was replaced by S. O'Grady who remained until

---

1. SAA 790/1907/277.
2. SAA 790/1908/108. Warden O'Grady recommended the subsidy because fo the "stagnation in mining here".
3. SAA 790/1896/474 and 475.
4. SAA 790/1901/467. The locally employed men usually worked as labourers, occasionally as engine driver.

1913 and was the last full-time manager. Grundy had recommended O'Grady for the post as he was "steady (which) makes a great difference when one in going to take charge in a place where liquor is plentiful and the temptations very great."[1] The men employed at the Works seemed to have kept very much to themselves, and to feel a cut above the ordinary mining population. This attitude comes through very clearly in the correspondence on the various problems in 1900, and again in the similar situation of 1911-12 referred to in the general history and other sections.

Finally, the Police Station was established at Arltunga in January, 1899, as mentioned in the general history. The first Mounted Constable was Charles Patrick Johnston, who came out with two native trackers, Jack and Wilkie.[2] Johnston remained until May 1902 and was replaced by Corporal Charles Nalty. In 1903 a small camp was established at Winnecke's Depot, with Mounted Constable Catchlove in charge, with one native tracker seconded from Arltunga. Another Constable, Pflaum, was sent to Arltunga, but he was recalled in January 1904 when Catchlove was transferred to Arltunga, and then back to Alice Springs. In 1905 Nalty was replaced by Mounted Constable Matthew Dowdy, who remained until his death in 1915, and was buried in the White Range cemetery. Although there was very little mining activity, the police station was kept open until 1943, when it was moved to the Hart's Range.

M. C. Johnston had objected to sharing the police buildings with Warden Mueller in 1900, on the grounds that "In an uncivilised place like Arltunga it is very necessary that the Police should hold themselves aloof from everyone".[3] Corporal Nalty did not hold such strong views. In February, 1905 Mr. H. Sutherland wrote to one of the Members of Parliament for the Northern

---

1. SAA 790/1903/58
2. SAA 790/1898/365. It had not been possible to send Johnston earlier, he had been excorting a lunatic to Oodnadatta.
3. SAA 790/1900/220, also referred to in section on buildings.

Territory, Mr. V. L. Solomon, complaining that Nalty had been drunk and incapable at the Arltunga Races:

> "He lay at the back of one of the sheds on the course with two blackfellows standing guard over him all the afternoon ...
>
> It was something disgusting one man laying drunk in the sand with his trousers down over his knees. I went twice and covered his nakedness. Others using disgusting language and no police officer to keep order, ladies could not come near the crowd."[1]

As Nalty was about to retire, no official action was taken, except that he was replaced in June.

There were no particular problems during the early years of Dowdy's service at Arltunga, until the troubled years of 1911 and 1912. Dowdy accused the Battery Manager, O'Grady, of sly-grog selling in partnership with the storekeeper, Robert Lake. O'Grady replied by pointing out that Dowdy and he had been friends until then, but someone had reported the policeman for insobriety, and Dowdy thought that O'Grady had been that person. The situation had worsened when O'Grady, as Warden, had asked several stockowners, including Dowdy, to remove stock from the Commonage Reserve, which was being used quite illegally. A report on the situation by Ronald MacPherson suggested that the police should not be able to hold mining leases or own stock, presumably on the basis that any such activity was prejudicial to their position.[2] Whatever the rights and wrongs of the situation, Dowdy remained on the field until his death, in 1915.

The storekeepers were so important to the field that they have appeared in the general history and the section on supplies in enough detail to show their position, power and problems. There is very little further information, apart from the fact that Joseph Harding moved to Oodnadatta in 1904, John Wilson tried to

---

1. Letter of 14th February, 1905, not sent on to Police Department until 11th May: SAA 790/1905/284. Nalty had also been reported for incorrect behaviour at the time of Luce's death in 1903 (see page 37).
2. AA(C) A3 12/1282 and AA(D) F144, 204.

commit suicide at Winnecke's Depot in 1903, and that T. A. Wallis stood for Parliament in 1899, without success.[1]

Information on the miners is rather fragmentary, often with names mentioned in various files of registers, so the footnotes have been left out. All the information came from the Department of the Northern Territory files or the registers in the Darwin or Adelaide archives.

Although the mining population was very small in the early years of the goldfield, it is suprising how many of the pioneers remained at Arltunga until they died. The small cemetery at the White Range contains twelve graves and some retain names and dates. One headstone has the words: Come unto me all that travail and I will give you rest; most appropriate for the extremely hard work done by the Arltunga miners.

Henry Luce was one of the first buried here (of the identifiable graves, anyway), in November 1903. From his letters, and signatures on petitions, he was an educated man, and became well known on the field. He was on the field by 1890, when he signed a petition in May against allowing a publican on the field. (He signed petitions in 1892, 97,98,99,1900,01 and 1902). By 1895 he, in partnership with Vilkson owned the Huntingdon Mill brought to Arltunga by the Wheal Fortune Mining Company. Vilkson had bought the Mill in 1893 in rather shady circumstances - paying £13 for plant that cost £700. The Mill was stationed at Claraville by 1895, and the two men had taken and opened up the promising McDonnell Range Reef. There was some correspondence about moving the mill and in 1897 Luce was allowed to use the Star of the North well. Unfortunately, the Government Battery took over the well late in 1897, and no doubt the coming of the bigger plant would

---

1. Harding took over the Transcontinential Hotel lease, SAA GRG 7 op cit. Wilson's suicide attempt was reported by Dr. Shanahan, SAA 790/1903/497, in September. Wilson had taken an overdose and slashed his elbows and throat, without success. Wallis is listed in Hughes, C.A. and B.D. Graham, Voting for the South Australian, Western Australian and Tasmanian Lower Houses, 1890-1964.

have made the Huntingdon Mill superfluous. However, about this time Luce had looked at the White Range area and realised its potential; by February 1898 he had pegged out his White Range claim. At his death he had interests in the White Range Boulder and White Range Extended blocks, all three were valued at almost £3,000 in July 1905. The White Range was the richest of all the White Range claims, and between March 1898 and August 1904 gold valued at £10,086.

Although Luce's death was reported by both the Warden and the Battery Manager, the most detailed account came from Mr. J. Sutherland, in a letter of complaint about Corporal Nalty's behaviour. The letter was written on 30th January:

> "On the morning of the 20th December about 7 a.m. Mr. C. Williams of White Range came to my place and informed me that Henry Luce had died sometime during the night. I asked him if any person was present when Luce died and he said no. He then said a Lubra (Black Gin) called him at daylight and told him Luce was dead.
>
> I then asked him if he had sent work to the police. And he said yes ..... At about 9 a.m. I went to Luce's camp and viewed the body. The police had not turned up ....."[1]

Corporal Nalty sent word that he would not come to view the body, so Sutherland, as a Justiceof the Peace, gave a certificate of burial. Luce had left only a very rough will, and the settlement of the estate was not completed until January 1906, when Mr. Henry Cadd bought the claims.

Joseph Hele, date of death unknown, was one of the pioneers of the field, and said to be, with his partner Isaac Smith, the first to find gold at Paddy's Hole. In 1892 a James Lamb suggested the two men would be suitable recipients for the Government programme of aid to prospectors. Lamb said that Hele had been a teamster who had sold up to prospect the field. The Warden also reported favourably, and thought he was an old and experienced prospector "the discoverer of several Copper Mines in ... South Australia". Hele was mentioned in Hilliers first report

---

1. SAA 790/1904/105. For settlement of Luce's estate, see 1904/305

on the Paddy's Hole claims in December 1887, and again in 1888 and 1889. He signed petitions in 1896, 97,99,1902 and 1904, by which time he was at the White Range. In 1901 he was found suffering from scurvy, so can't have made very much money for all his work.

Charles Williams who died in 1908, aged 46, was another pioneer of the White Range area. He pegged the Excelsior claim a month after Luce, plus the White Range South and West blocks, soon abandoned and takenup by others. By August 1898 he had formed a Syndicate to operate the Excelsior, with himself as Honorary Secretary, and four employed men. He retained his interest in the claim when it was floated into a public Company in March 1900, although a Mr. Waite became Manager. The results from the claim were second only to Luce's White Range, and Williams had interests in other claims on the Range as had most of the miners. In 1900 he was referred to as the proprietor of the West block. In the same year the Excelsior Gold Mining Company received a subsidy from the Government to drive a tunnel to test the reef. The Company anticipated driving for some 100 feet, but were stopped by the extreme hardness of the rock after 36 feet. In November 1901 the Secretary of the Company mentioned that over £1,000 had been spent on the claim over the previous 15 months. This must have exhausted their cpaital, for the Company asked for and got very generous exemptions from work, while attempts were made to raise capital in Adelaide.

The Company struggled on, suffering another setback late in 1904, when Robert Stuart, who had taken out an option over the Excelsior, suddenly died. His grave is the only one with a headstone which contains the information that Stuart was born in Boston, Mass., and was 55 when he died. He must have been a fairly recent arrival, with capital, for I can find no other references to him. In 1905 the Excelsior Gold Mining Company suggested that the Battery be moved to the White Range, as it hoped to amalgamate some of the claims. Neither move nor amalgamation took place, although in July 1906 the Excelsior and White Range South blocks were amalgamated, the £2 cost paid by Williams. In 1908 there was quite a lot of ill feeling among other White Range

miners when the Company requested extra work exemptions. Apparently Frederick May and four others had been working the claim but had left, hoping to force the forfeiture of the lease. The situation was complicated when Williams died in July, but by December 1908 the lease was forfeited to May, Louis A Garvon, C.A. Eales and Elizabeth O'Neil. In 1909 Williams' ¼ share in the White Range Extended Hock was transferred to Eales.

Frederick May came to the field in 1896 and was employed as engine driver at the Government Battery from December 1898. He resigned in March 1901, but was employed at the Battery on a casual basis in 1903 and possibly on other occasions. Otherwise he worked on Luce's White Range and the Excelsior blocks; in 1906 he took over F.G. Klau's ¼ interest in the White Range East claim. After the Excelsior lease was forfeited to him and three others, May remained at the White Range until his death late in 1912 or early 1913: on January 30th, 1913 his share was transferred to Robert Lake. He might be buried in one of the unmarked graves at the cemetery.

Patrick O'Neil was a relatively late arrival to the White Range, and probably came during the boom period of 1903. In August of that year there was a reference to O'Neil having been at the Range for the last five months. He was quick to seize any advantage if he had arrived in March, because by May Warden Gee had allotted him a business site near Wilson's store, where O'Neil could have a billiard table. The licence for the table was granted in September, but not renewed - no doubt the disappointment when Chalmers decided against investing in the Range claims affected the population and the cash flow on the field. However O'Neil continued to work as a miner, and Elizabeth or Betty O'Neil, married woman and presumably Patrick's wife was at White Range by 1904, if not before. B. O'Neil signed a petition in 1904, as did two other married women, Mary Murphy and F. Sutherland - probably the first white women to live on the field. Patrick O'Neil was one of thirteen miners (including Fred May) who petitioned against allowing exemptions to the Excelsior Company in 1908. As Elizabeth took over the one quarter share in the Company when it was forfeited in December, it is possible that

Patrick had died. There were no further references to either Patrick or Elizabeth O'Neil.

There were many other miners at Arltunga, but I have concentrated on the White Range population as my main interest centred on this area. There were many other White Range miners too, some of whom have been mentioned in the general history section. Frederick Messau could hold the record for time on the field: he had arrived by 1890, and was still there in 1913, and had moved to the White Range area soon after its discovery. William Perks was another long-time resident, from at least 1892 until 1908 and possibly longer. In the second half of the 1890's there was a considerable increase in the population, due to the depression and the South Australian Government's attempts to encourage the Arltunga field by establishing the Battery. John Thompson came in 1896 and stayed until 1904, as did James Pound; Louis Schaber was on the field between 1896 and 1905, J. Shanahan between 1897 and 1901, J. Hamilston from 1897 to 1902. J. Glynn and A.E. Barrand arrived in 1897 and remained until 1908. These dates might not be completely accurate, but the men were definitely at Arltunga at those times; they signed at least some of the various petitions circulating the field between those dates.

One other mine, to the north of the White Range area, was of importance. The Wheal Fortune was one of the first, if not the first, reef mine to be opened up. It was operating as a Company by 1889, with R.J.E. Warburton as the Secretary in Adelaide and a Mr. Parke as the Manager. In 1890 the Huntingdon Mill had started work, and by November the Department had agreed to a £1,000 subsidy to test the reef. By 1894 the Company was in trouble, mainly through the suspiciously sudden selling up of the Mill to M. Vilkson (see under H.E. Luce). John Smith was mentioned in connection with the mine in 1896, and was certainly the holder by 1899, and applied for a subsidy in September of that year. In approving the application, Warden Mueller referred to Smith as "a prospector and worker on this field from the first, and I think was the original discoverer of that reef". Unfortunately, Smith had a bad accident in November, and spent some

months in Adelaide. He was back at work in October 1900, and continued working with fair success on the mine. He was one of the few illiterate miners on the field, and always signed petitions with a cross. Maybe three or four others did the same, and there were occasional references to men unable to write, and there may have been more who weren't interested in signing petitions or taking part in the public life of the field, such as it was. Smith remained at the Wheal Fortune until 1908, when the whole claim was transferred to T. A. Wallis. Considering his long record on the field, and at the Wheal Fortune, it is probable that Smith had died.

MINORITIES

Given the difficulties of getting a varied diet on the field, it is surprising that the mines objected so strongly to the presence of a Chinese market gardener, in 1897. Warden Mueller wrote to the Department about the matter on December 1st[1] saying he'd issued the man with a Miners Right, but that he intended growing vegetables rather than searching for gold. The miner's objection was that more Chinese might come to field, although "his removal would mean living without vegetables so necessary to the health of the community, which we have hitherto had to do without".[2] Miners generally were very nervous of the presence of Chinese on fields, especially since the spectacular finds in the Top End of the Territory in the 1870's and 80's had attracted thousands. As the Chinese were prepared to work for less than Europeans, they were very unpopular. The problem became so great that "Asiatics" were eventually banned from holding a gold mining lease by the Act of 1895, although they could hold Miner's Rights and a claim. There had been fears of the Chinese miners moving down to the centre in 1893, but of the seven that came,

---

1. SAA 790/1897/460
2. The only other attempt at market gardening, according to the records, occurred in 1907, when a 5 acre garden area was registered for 2 years in the name of S. Riches. AA (D) Book of Registrations.

"3 only remained as cooks and gardeners."[1] The only other mention of any "alien" presence occurs in 1899 when a Chinese miner tries to work on the field, but aroused great anti Chinese feeling.[2] Although the Minister for the Northern Territory points out that he's allowed to stay, there is no other written evidence for any Chinese presence, so I presume the miners were inclined to take the law into their own hands.

There was another group on the goldfield that caused slightly different problems - the Aborigines. They had begun to take an interest in the European presence from the time of the ruby rush (M. C. Hillier, December 18th, 1887/121) "the Aborigines are very quiet in the whole of this district, about 100 wild ones have made their appearance at the Ruby fields during the last few days". The first definite mention of Aborigines working for Europeans came in 1896, in a report from Warden Mueller, August 20th: "Hitherto I have been allowing one claim to be held where a native has been working for the holders of Mining Tenements, as it is necessary to employ him for taking care of their horses, carting water for the camps and to make himself generally useful." The real problem is the "agitation against the employment of coloured labour throughout the colony ...." but as the Minister points out, "Australian aborigines are not to be classed with Asiatic labour".[3]

Although this was accepted, the Warden was still worried in February of the next year, about aborigines and Miner's Rights:

> "In the first place, Natives will not remain on a claim for more than 2 or 3 months at a time, before they will ask to be released or decamp without notice. Attempts will be made to remedy this by substituting other natives, which could be done should a stranger act as

---

1. SAA 790/1893/417, telegram from Warden in November.
2. SAA 790/1899/176.
3. SAA 790/1896/390, correspondence in August and September.

> Warden .... and this would give opportunities for jumping claims, besides the unlawful transfer of Miner's Rights. Secondly a native will not do a proper days work when on the mine ... A third reason is the objection of white labour to see blacks taking their places ...."1

Some of the unemployed whites had already complained, and Warden Mueller suggested that only "one or two natives be allowed to hold a claim each .....for looking after the horses and for water carting, etc".

Some years later the problems were of a different nature; in February 1900 the Warden received several complaints about food being stolen. As the Mounted Constable, Johnstone, was away taking prisoners to Port Augusta (which took him from 26th October to 18th February), his report took some months to reach the Department.

> "These men (miners) who with very few exceptions are a very low class, keep lubras about their camps to do washing, cooking etc., they go willingly to work for these men knowing that they can them get plenty of food and tobacco for themselves and their blackfellows who are usually camped close by. They steal the food and the blackfellows get the blame. I have repeatedly told the men that if they will keep lubras about their camps they must expect to lose their rations. They have never, as far as I can ascertain, ever stolen anything but food"2

There was an extra problem for the pastoralists in the surrounding district - the aboriginals killed their cattle, and gaol was no punishment. Johnstone said in this same report, that of 5 natives gaoled, 3 had again killed cattle since their release.

Sub-Inspector Clode from Port Augusta visited the field in 1905, and he gave quite a full description of the situation at the White Range:

> "....I saw and spoke to a number of Aboriginal natives and got the following information - over 100 natives in vicinity of White Range ....about 17 working for white people who in

---

1. Ibid.
2. SAA 790/1900/80, March 24th.

> payment....supplied them with food which they always shared with the Blacks not employed, especially the Old and Infirm, a scanty supply of clothing was given to those who worked, but not Blankets....
>
> The Old and Infirm, also, girls form ten to thirteen years of age were in a nude state. There were also two or three white men living with Black lubras,....these people have families of halfcastes growing up who are properly fed and clothed. But this may not last for long as probably the men may leave for some other state in which case he would leave the Lubra and Children, who would then be thrown upon the burden of the State. This shows a very immoral state of affairs.
>
> ....suggest blankets and food supplied and Depot established at Arltunga under Corporal Nalty..... I am of the opinion that if food and clothing were supplied to them it would be the means of putting a stop to many crimes now commited by them, especially cattle killing".1

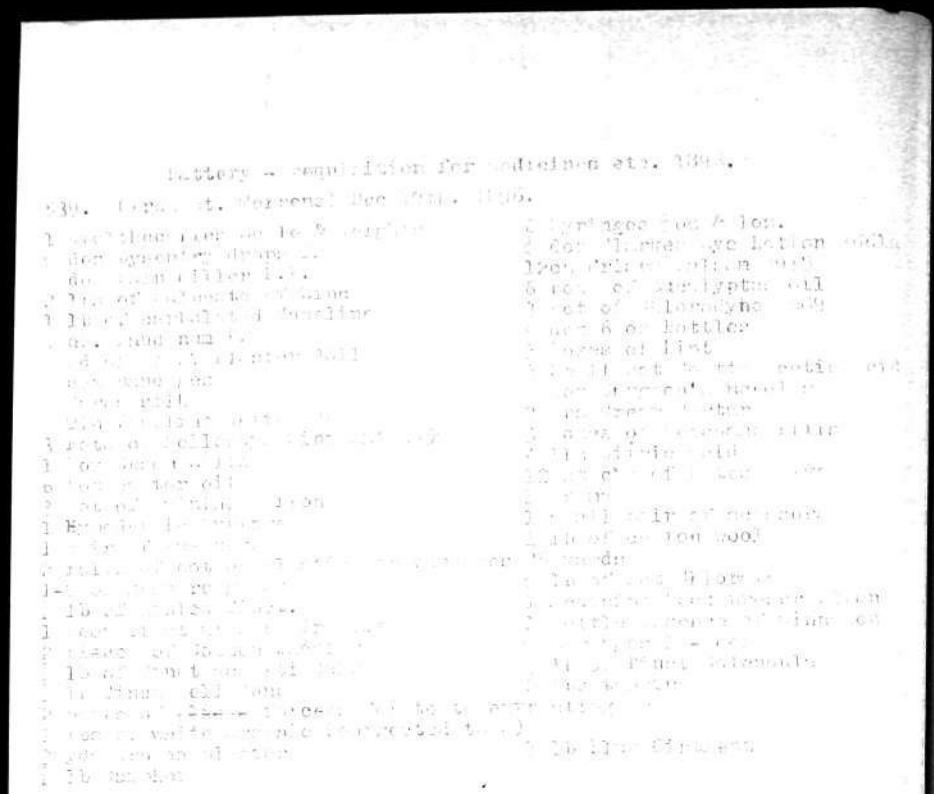
As usual, the Manager of the Works is asked to comment on this report, and does so in January 1906. He disagreed about the nudity, and about giving them food, because the natives would not work then. "A large number of native youths and men who are not too old to work are employed in various occupations by the "Whites" who could not get along without them, especially where homes have to be looked after, the women also find employment as water carriers, "laundry maids" and "goat shepherds". He did agree that blankets were needed but nothing further was done.

HEALTH & WELFARE

Otherwise, the aborigines are mentioned only in the reports of the Health Inspector (the local constable), apart from the very derogatory references by Dr. Shanahan during the great typhoid crisis of 1903.[2] On the whole, their health seemed good apart from colds and flu suffered in 1907, 1910 and 1911, when the Europeans suffered too. The 1911 outbreak was particularly severe. "Some (Aboriginals) are now lying in their camps unable to walk or hunt for food or game..." and the Constable asked the Department

---

1. SAA/790/1905/574.
2. SAA 790/1903/497, general introduction, P.12. The doctor considered the Aboriginal responsible for contamination in Alice Springs because of their filthy habits.



Copy of Govt. Battery requisition for medicines, 1896.

to provide medicine. This reference to hunting is interesting - did they hunt all through the mining period, or only when the mining population had declined - the numbers could have been as low as 30 by now. The earlier references to the women stealing food suggests that there wasn't enough "tucker" earned by the working Aboriginals, and that they would need to supplement their supplies by hunting.

Although the general health of the field was described as "good" in most reports, any medical problems would have been difficult to treat. When the Government Battery and Cyanide Works was being organised in 1896, the Manager put in a long list of basic medical supplies - including a book on first aid, and forceps for tooth extraction. By 1899 the Warden was asking for help as "I am frequently receiving applications for remedies..." and have to apply to Mr. Grundy (Manager) for some of his small stock which is nearly exhausted". Another stock, similar to the Battery's supplies was sent up, and arrived by June 1901.[1]

There were major hazards in mining, particularly reef mining, where explosives were used to extend shafts or drives. In 1899 John Smith of the Wheak Fortune mine was involved in such an accident. Manager Grundy reported, on October 26th "...(Smith) has gone to Adelaide suffering from a severe accident, through the explosion of a charge in his mine". Warden Mueller was a little more explicit in his report of November. "...the owner met with a severe Dynamite Accident, which badly lacerated his body".[2] Having survived the accident and the trip to Adelaide, Smith was back on the field in October 1900 "ready to commence working on the shaft". Another miner was not quite so fortunate: John Byrne, as mentioned in the section on wells, died "from a chill caught when coming out of the well over-heated".

Other deaths were mentioned, especially after the typhoid out-

---

1. SAA 790/1900/52.
2. SAA 790/1899/427

break, and great care was taken to point out that there were infectious diseases about. H. E. Luce, one of the better known miners and exploiter of the White Range, died on 18th December 1903, "death due to dropsy". In March 1906, the assayer at the Works, died suddenly from influenza. The Warden's report of November 1904 mentioned the death of Mr. R. Stuart and Mr. John Shanahan "neither from any contagious disease".[1] The graves still with names and dates at the White Range cemetery show that the men died between the ages of 46 and 52, and although not mentioned in the official correspondence, a common cause of death was "dust in the lungs". The ore dust was very fine, and the very primitive conditions in the mines, with no ventilation, would have made it impossible to avoid inhaling the dust. The miners called this "disease" pthisses, but my medical contact tells me the term refers to tuberculosis, and was incorrectly used. Liver complaints would have been farily common on the field, from the amount written on the problems of alcohol, and the number of broken bottles scattered everywhere.

Destitute miners were another problem. Warden Mueller's letter asking for extra medical supplies in 1899 pointed out the expense of getting sick people to Alice Springs, and accommodating them there as "generally these persons are without means."[2] In 1901/256; April M. C. Johnstone reported that Joseph Hele, one of the pioneers of the field, had been found in his tent suffering from scurvy.[3] In 1902, when water was scarce along the track from Alice Springs to Arltunga, the Warden reported in May that he "was obliged to get one man buried some time ago between here and Alice Springs whom I found perished....."[4] The hazards of mining were many and various. In 1904, well after the typhoid scare, there was request for another doctor on the field as "there are six families/white women with their husbands and children at White Range, and three others are leaving for Winnecke's

---

1. SAA 790/1904/45
2. SAA 790/1900/52
3. SAA 790/1901/256, report in April.
4. SAA 790/1902/30

immediately, while Alice Springs has a woman and child population of about 16.....".[1] Although nothing further was done about providing a doctor, this request is interesting because it was the first reference to white women on the field. In November of the same year, when the Government was petitioned to have polling booths at White Range (population 25), three married women signed it - Mary Murphy, F. Sutherland and B. O'Neil.[2] On the whole, the women folk were left at home, which was usually Adelaide. The general feeling of the men was expressed in a letter from F. Egan, employed at the Government Works.

> "By the time this reaches you, I shall have been stationed here at Arltunga Cyanide Works, as Fitter and Engine driver, for a period of 18 months. Being a married man the wife and family residing at Southwark near Adelaide, we are desirous that once again we should come together.
>
> This place, as you are well aware, being so far from any centre of civilisation does not offer the least encouragement to introduce a family with a view to settlement"3

---

1. SAA 790/1904/348.
2. SAA 790/1904/497.
3. SAA 790/1899/504. Letter dated 11th November.

PART II: THE EXCAVATION.



Plate 1: The White Range, from the air and north-east. The mines show up very clearly, and the main settlement area was in the area between the Range itself and the track (in the creekbed for the most part) which runs across the middle of the photograph, from right to left.

THE EXCAVATION

Introduction

The White Range settlement is scattered over the rough hills and gullies below the quartzite bluff of the Range itself which contains most of the mines. Other mines and buildings occur on the north and west sides of the Range, but for the purposes of this excavation, only the east side was explored. This particular area of the Arltunga goldfield was chosen largely because it was less exposed to the public than other sites, and contained a lot of building remains of different types fairly close together. And as I was more interested in the domestic side of the miners' lives, rather than the economic and working side, the settlement area was more appropriate than the "public buildings" of the Battery or Police Station sites. The latter areas presented greater security problems, too, being well frequented by visitors. I felt that the Territory Parks and Wildlife Commission were doing more than enough to support an "outside" excavation, without being involved in fencing off sites and helping with extra security. Since my first visit to Arltunga, with a view to excavation, in 1976, there has been a great increase in the awareness of everybody even remotely concerned with Arltunga of its importance, and any further excavation may well concentrate on the more public areas.

At the White Range, it became obvious that the stone remains were more numerous than realised at my first visit. Planning was made more difficult because of the undulating country, and natural outcrops of schist which often looked man-made from a distance. The full extent of the settlement was not



Plate 2: General view of the WRA site; the pavement area has been cleared as well as the interior of the stone building. The Range rises quite steeply beyond the store; the D site is away to the left.

realised until 1978 and finally planned in 1979. The remains have been described in the buildings section, and varied from single chimneys to low-walled rectangular or square "rooms" to the more substantial "house" structures.

On my first visit in 1976 to look at possible sites, I was taken to a comparatively open area, just below the quartz bluff, where a fine stone structure was identified as the store. Some fifty metres south was a group of stone remains, and I decided to investigate both these areas. The store would be the focal point of any settlement, and I hoped that the second group would prove to be a miners camp. There was a considerable amount of information about the storekeepers and the type and range of stores available, and I felt that excavation could substantiate the documentary evidence, or point to new avenues of research. Although there was a certain amount of information about the men at White Range, I was sure that it would not be possible to identify any "camp" as belonging to any particular person, but hoped that there would be sufficient difference in the artifacts to indicate that the second group was a domestic site. Both sites turned out to be a little more complicated, as the detailed report shows.

The store site was designated White Range A site, or WRA, and a two metre grid was laid out, with 50 cm baulks left along the north-south axis. I decided against leaving baulks around every square as I anticipated that the archaeological deposits would be shallow. This worked well on the WRA site, which encouraged me to excavate on an open

plan on the second site, designated WRD.* The A site had produced a suprising amount of structural information, and it seemed likely that the D site contained several related buildings, and I wanted to see them in their entirity. The base line ran east-west to the north of the three main structural remains, and the original area of 10 by 12 metres was extended as necessary.

The spoil jump for the A site was positioned at the NW corner of the excavated area, with subsidiary stone dump, for the fallen wall within the store, directly to the east of the store entrance. On the D site the main dump was to the NE, with a stone dump at the western end of the base line.

* I found it very difficult to stop volunteers from picking up surface finds near the camp sites, so labelled the nearby 1940s battery area as WRB, and the camp area as WRC. In this way I had some idea of the provenance of such finds.



Plate 3: WRA, stone building and pavement, with workers. From N.E.

WRA - the Store site

The importance of the storekeepers has been made plain in the historical introduction. The exact date for the setting up of a store at the White Range is not yet known, but I feel sure that it would have followed the discovery of gold very closely. John Wilson held the licence from at least 1902 until 1911, when his long time manager, Francis Bignell took over for two years. By 1913 the White Range was practically deserted, and the commercial and mining interests were centred on the Crossroads area.

The two most obvious features of the "Store" site were the stone building itself and the large paved area slightly to the north, twice the length of the building. The building is by far the finest in the White Range area, very well constructed although the walls are not quite at right angles. The door opening faces slightly north of east, and openings for two windows remain in the middle of the north and west walls. The building is rectangular, 4.6 by 3 metres with walls averaging 50 cms thick. While all the walls show signs of collapse, the long southern wall had suffered the most. Heaped along the outside of this and the western wall was a mound of small grey stones; as this would have no cooling value for the building, it may have had some structural use. When the interior of the store was cleaned out, removing the fallen wall stones and fine mortar, we found that the bedrock had been dug out, giving extra depth and possibly coolness to the building. The rubble mound may have been heaped around the outside walls simply because it was lying around.



Plate 4: (a) 2G, wind tunnel entrance, weeded. From S.

(b) 2G, wind tunnel entrance cleared, store in background. From S.E.



A closer look at the interior showed that the whole building had been very carefully planned. Three solid steps led down into the interior, and on either side, within the east wall construction were two small indentations. The one to the north of the steps was only very shallow, but that to the south obviously extended underneath the wall. It was situated on top of the bedrock (here some 25 cms deep), a space of 25 by 20 cm. Further investigations outside the store indicated that a mound of small and large stones three to four metres south east of the store entrance could provide an answer. Most of this mound was within square 2G, and the possible entrance, then covered by rubble, seemed to be in the south east corner of the square. (Pl.4a)

Once the surface weeds, small stones and some light brown soil of layer (1) were removed, two curving lines of stones were obvious from the centre of the square to the middle of the east baulk and to the south east corner. In the gap between these lines were several stones and light brown soil, layer (2). There was very little difference in the soil deposit, but the second layer came from within the entrance area only. When it was removed, to bedrock, the lines of stones were revealed as two small retaining walls leading into a tunnel. This tunnel was roofed with large flat stones - these could be seen at the entrance and later in a section through the tunnel in square 3F. (Plate 4b) The mound could have been formed from rubble from the interior of the store as there was no sign of further excavation into bedrock in the tunnel area. The wedge-shaped entrance faced down a small gully to the south-east, into the prevailing winds, and there can be no doubt that this was a wind tunnel to allow cooling winds into the stone building. Within layer (2) a square of wire mesh was found which may have secured the entrance from the incursions of small animals

and snakes.

There did not seem to be any point in excavating through the mound in 2G to check the line of the wind tunnel, but some excavation was done in 3F. The square contained very patchy deposits once most of the orangey-brown layer (2) was removed. Areas of light grey rubble appeared in the south east and south west corners, and along the western baulk, layer (5) which could have spread from the wind tunnel fill; the rest of the southern area was covered in light orangey-brown layer (3) over bedrock, greyish-red layer (4) in the north-east and light orange (6) in the north-west corner. Extending from the middle of both north and south baulks, but not meeting, were two areas of bedrock, and soon the line of the wind tunnel became quite obvious - a grey rubble fill over the tunnel. A small section was put down near the south east corner of the square to make sure that the tunnel did exist, and once the grey fill was removed, some of the large roofing stones were found. One of these was lifted, and apart from the skeleton of a small animal, the tunnel was free of blockages. It was quite easy to see the length of the tunnel, from either end, so the work had stood the test of time extremely well.

Some work was done in square 3E which covered the store entrance, largely to protect the surface finds. Although not completely excavated, the square gave no indication of further structural information, and as time was limited, was left. Some further work was done at the western end of the store where a small quartz filled hole in the middle of the west wall was investigated. It was possible that there was an " exit" wind tunnel, but a small section through the



Plate 5: 2A, 3A, 4A, excavated post trench along north of pavement, from W.

mound outside the wall gave no indication of any such feature.

The excavations around the stone building were carried out over a period of months, concurrently with excavations north of the store and around the paved area. The work in 4C and 5 C uncovered a post trench in the southern part of both squares, probably extending further east and west, and so it was decided to check all round the paved area.

Along the north side of the paving the sequence of deposits was quite straightforward, extending from 2A at the north-east corner, to 6A at the north-west. The paving ended in the western half of 5A, but the post trench continued just into the eastern half of 6A before turning south. The northern edge of the paving was not very straight - in 2A and half 3A it covered the southern 75 cms. of the square, broadening to 1 metre in 4A before narrowing again in 5A. Once the surface layer (1) was weeded and finds collected, the underlying deposits showed up as light orangey-brown, layer (2) along the northern edge of the squares, with a darker brown softer soil containing small stones, layer (3) closer to the pavement. In most cases the light brown was a shallow deposit, soon coming down to bedrock, but the darker brown (3) became the deeper trench, containing post-holes. In 2A there were two postholes within the trench, plus another half shared with 3A; 3A also contained three other postholes, 4A four and 5A two. The final posthole in 6A marked the north-west corner of the structure, which then turned south.

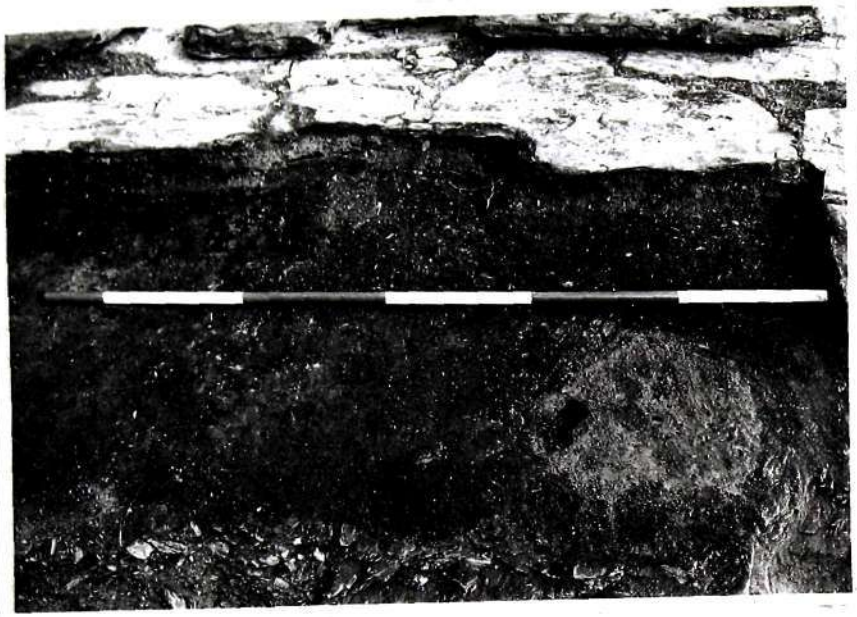


Plate 6: 4A, deposits beneath paving stones. Black deposit (11) at left, behind ranging pole; clay-like layer (9) at right are the most obvious. From N.

When layer (3) was excavated, although it continued from square to square without much change, it was obvious that it was not completely aligned with the paving. (Plate 5) In 2A and 3A the trench was slightly north of the paving, but in 4A and 5A it was right against it, and in 4A seemed to continue under the stones. On plan the stones within 4A and 4B looked larger than those in the rest of the paved area, and with the depth of deposit under the stones there, it seemed necessary to take a look. (In most cases, where it could be seen, bedrock was a bare 2 - 5 cms. beneath the paving stones).

Most of the paving stones were lifted from the southern part of 4A, and when the underlying soil was cleaned over, a variety of deposits were seen, particularly in the western area. Most of the eastern part was covered with a mixed brown and black, layer (4), with a light brown (8) over part of the western area. In the south-west corner, close to the remaining stones, was a well defined patch of orangey clay, layer (5), with layer (6) a light biscuit brown just to the east, and beyond that a small patch of orange-brown, layer (7). When these were removed - and all the deposits were very shallow - the western end of the square contained several small, well defined deposits.(Plate 6) Layer (9) was a yellowy clay with charcoal and layer (10) another area of biscuit brown clay, and along the southern edge in the eastern half was a more extensive deposit of soft black soil, very loose in texture.(11) The rest of the square was covered with a patchy brown to reddish brown soil. Layer (11) proved to be deeper than most other layers, being 12 cm. deep in the middle, although much shallower at its edges; it continued under the paving stones towards 4B. The darker reddish brown soil in the eastern half of the

square covered another posthole, just south of the post trench, but definitely beneath the paving stones. There did not appear to be any obviously structural deposits under the paving, and it may be that there was a natural hollow in this area which had to be filled when the paving was put down. Certainly there was a hollow in the northern part of the square, at the eastern end, which sloped down to the post trench. And the real southern section of the square shows a depth of 10 to 20 cms, as opposed to the 20 - 40 cms. at the edge of the paving. The final post-hole, and the slight difference in the size of the paving stones may point to differing dates for building in this particular area.

The southern post trench area was a little more complicated, with the trench some two metres south of the paving, halfway between paving and the stone building. And there were considerably more postholes, some associated with the post trench, some not. One difference, obvious almost from the surface, was a long, narrow very black deposit, stretching from the eastern edge of the pavement in 2C, to the western edge in 5/6C - almost 8 metres long and from 1 metre to 1.40 wide.

In 2C, most of the square was covered by a light orangey-brown soil, layer (2), with some small patches of ash in the north east corner. The solid black, layer (3) was very obvious in the north-west corner and there were two less definite but dark brown patches in the middle of the square, layer (4). Layer (3), when removed, was only 5 cms. thick and overlaid a patchy brown and gravel layer which in turn

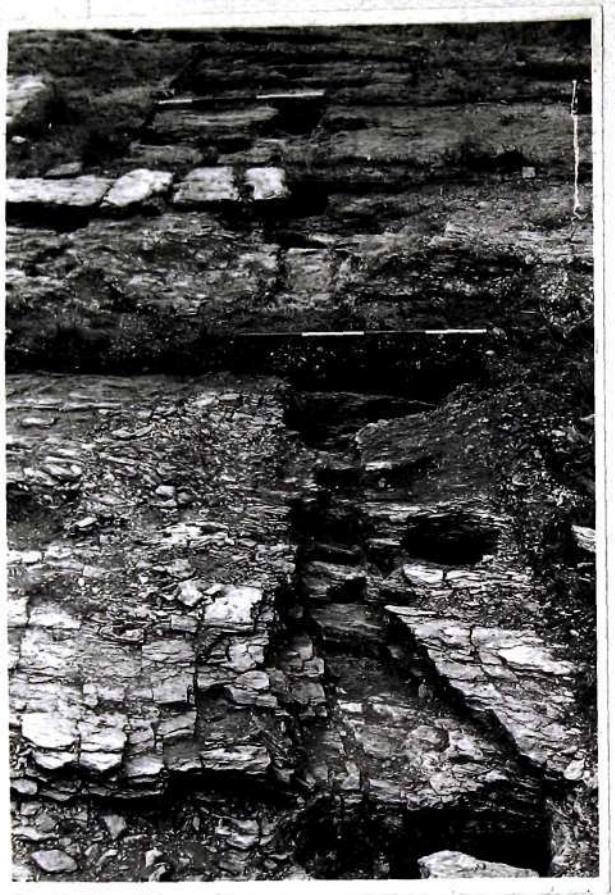


Plate 7: 3C,4C,5C,6C, southern post trench. From W.

covered the southern edges of two postholes, close to the north-west corner. In the middle of the square, running from west to east, layer (4) was the post trench deposit, running from the western baulk to a clover leaf of three postholes in the centre. The other patch of (4) became a single posthole between the cluster of three and the eastern baulk. There was a slight hollow extending from the central postholes north into the baulk, and a very narrow hollow extending to the southern baulk, which could have been natural.

In 3C the solid black layer was labelled (2), and extended along the northern third of the square. A light orangey-brown layer (3) covered most of the rest of the square except for the darker brown (4) of the post trench. When the black (2) was removed it was found to be shallow, as in 2C, with one extra feature - right in the north-west corner, above (2) was a tiny sliver of orange. This was very small, but continued into the western baulk and across 4C. In the southern part of the square, the post trench was found, extending across the square from 2C to 4C, and three postholes were excavated. The first, near the eastern baulk was just south of the trench showed as a dark brown area which then produced quite a lot of wood - the post remains, which stained the soil a darker reddish-brown. Around and under this rather loose, soft soil was a grey fill of small stones, found in most postholes on this site, as packing. The second posthole appeared well north of the trench, almost in the middle of the square, but the third was immediately south of the trench, like posthole 1, but near the western baulk. It contained some charcoal but no other post remains. The last posthole, or the southern half of it, was found on the northern baulk.



Plate 8: 4C and part 4B, possible post remains in and beneath layer (3). From W.

4C produced several suprises, especially in the northern part. Most of the square was covered with the orangey-brown of layer (2), with the solid black as layer (3), here divided into two by a 50 cm. wide deposit of fine orange, layer (4). This square was dug before 3C and 5C, and before the nature and extent of the black was realised, so some of (3) was taken off before it was seen that (4) was on top of (3). The orange was very shallow and sterile except for three tiny patches of a crumbly purple substance. Along the north baulk, the black (3) was particularly solid, and near the eastern end had quite a rounded look, similar to the last remains of a post. Other possible post remains were found beneath the main deposit, and planned. (Plate 8) . On the whole (3) contained very few artifacts, but between (4) and (3) there were a number of finds, labelled (5) to distinguish them from those within (3). Further work along the northern edge uncovered two postholes, half in 4B. The post trench continued through the southern half, and three postholes were found: one in the trench itself, and another "twin" immediately to the south, both near the eastern baulk, and the final posthole, also south of the trench, on the western side.

As the black deposit continued into 4B, this square was opened up. Only a very small area could be looked at, as the paving covered the northern two thirds, with one large stone extending across the eastern part of the square. The black, layer (3) appeared as a narrow deposit along the southern edge, most of the square being covered with the usual orangey-brown, layer (2). In the eastern area there was a soft textured whitish-grey deposit, layer (4), which gradually became (2) - the edges were not easy to find. This layer appeared to have extended into 4C, but was not noticed in that square. Apart from the postholes shared

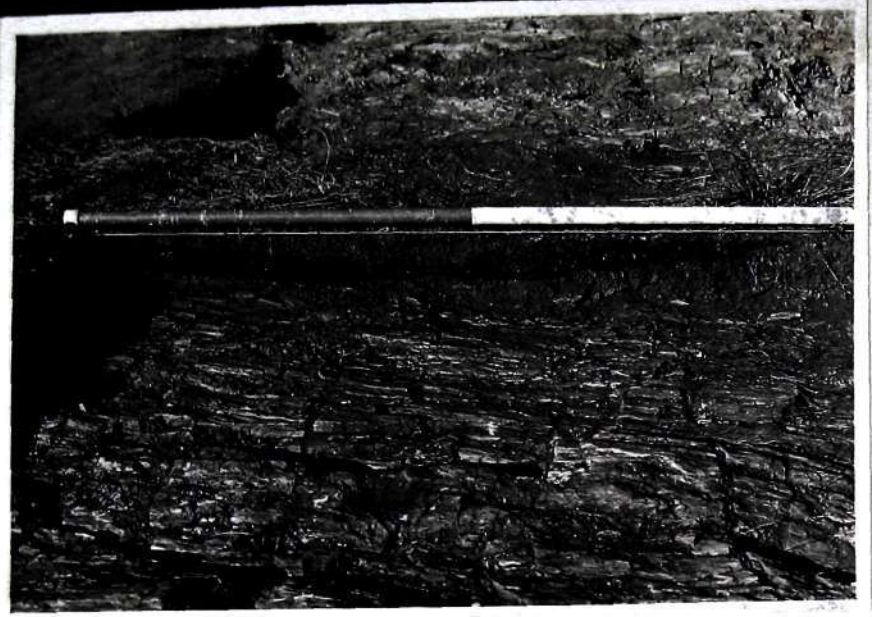


Plate 9: (a) 5C, east section, showing curve in black deposit (3), and softer southern edge.

(b) 5C completed, and 5B cleared. From S.



with 4c the deposits were not deep, bedrock appearing at 10 to 20 cms. below the surface.

In 5C most of the square contained orangey-brown layer (2), with the solid black (3) continuing along the northern side, partly covered by (2). The orange found in 4C did not continue, but it was felt that within (3) there was a change in texture from very hard to a soft, loose deposit. As this change could be planned, and became very obvious in section, the soft black became layer (3) and the hard black became (4). (Plate 9a) It is quite probable that (3) was the more worn and weathered edge of (4). A posthole was found beneath the deposit, close to the northern edge in the western half. In the middle of the southern baulk was a small ashy mound which continued into 5D. Also in the southern part the post trench continued, from 4C through to 6C. Posthole 2 occured within the trench, near the eastern baulk, and another was found just south of the trench near the western side. Much later, cleaning up the square during work on 5D, a fourth posthole was uncovered in the south-east corner, a twin for posthole 2 in the trench.

Again, 5B was opened up to check the width of the black deposit, and have another look at the edges of the pavement. As on the northern side of the pavement, this square was extended west into the 50cm baulk, to take in the area around the western end of the paving. Between the paving and the small line of black along the southern edge of the square the deposits were patchy and ill-defined: brown, grey and orange, with some black near the paving stones. Few finds and no deposits of any depth were found in this section, a more interesting area being revealed in the north-western quadrant. Here the pavement had been indented a little, and along the



Plate 10: Western post trench, 6C in foreground, 5B in middle distance, and 6A in background. From S.

short northern baulk were several colourful but shallow deposits. Layer (2), a pale orange, occurred in the middle of the northern baulk, overlying layer (3), a patchy grey-brown deposit running along the western edge of the pavement and extending across into the middle of the square. Partly beneath (2), but mostly under the western edge of (3) was another small deposit, of yellowy-brown (4), along the north baulk and in two other patches within the "indentation" of the pavement. Next to (4), between it and the pavement, was a soft black deposit, layer (5), quite narrow and some 7-8 cms. deep, as opposed to the 4 cms. of (3) and 2 cms. of (2) and (4). Along the western baulk was a dark brown deposit (6), which continued under the others, to the pavement edge. Beneath it was a posthole in the northern area. Both layers (3) and (6) continued along the western edge of the pavement and into the southern section of the square.

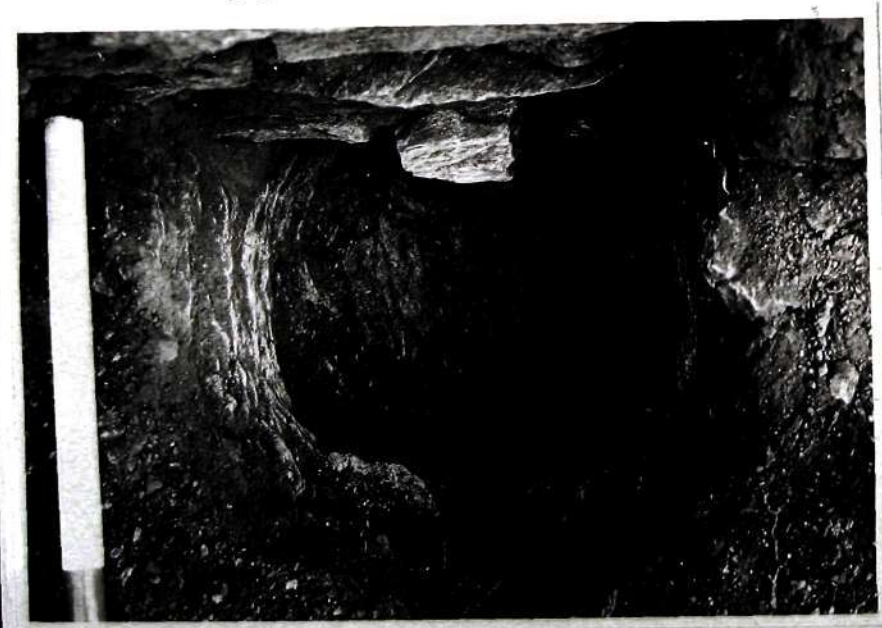
A particular feature of the "indented" pavement area was the concentration of artifacts: harness rivets, nails, tacks and some very unusual finds, mostly from layer (3). Unique to the excavation, so far, was a rectangular block pencil rubber, in such good condition that the manufacturer's label remained on one side - the Eagle Pencil Company of New York. A large teaspoon is one of the very few eating utensils yet found, while three pen nibs and a possible paper fastener were less unexpected, other nibs having been found around the pavement.

To return to the post trench running along the south side of the pavement: the south west corner post for the structure was found just in square 6C, with the post trench turning north; there was no sign of the solid black deposit.



Plate 11: (a) 3C and 3D, showing southern post trench and extra postholes in 3D. From SE.

(b) 5D Posthole 1 completed, showing position in relation to north wall of stone store. Above and N.



The baulk between 5C and 6C was opened up to check on this, and the black finished halfway across 5/6C, just beyond the western edge of the paving.

The appearance of postholes between paving and stone building did not end with the C squares - several more were found in the adjoining D squares, from 2D to 5D. These squares, for the most part, were uninteresting to excavate, containing a shallow deposit of light orangey-brown soil on bedrock. Unfortunately the bedrock undulated, and it was only while cleaning the southern section of 3D that the two postholes along that baulk were discovered. This lead to further investigations in 4D and the opening up of 2D and 5D. In all squares there were areas of darker brown, occasionally with some ash, covering small, loosely packed stones, just above the postholes.

The large postholes in 4D and 5D occur right under the north wall of the store. In the northern parts of squares 3D and 4D smaller postholes were found, while in 2D the northern posthole was much larger, and aligned with cluster of three postholes in 2C. No postholes was found in the northern part of 5D, but it is possible that it was missed. Because of time limits, the square was not completely excavated to bedrock. The same limits prevented the opening up of 6D or 5/6D, especially as at that, the north-west corner of the store building, there was quite a build up of the small rubbly stuff, heaped around the west and south walls of the building. The large posthole in the middle of 2D could indicate the eastern end of this structure. If

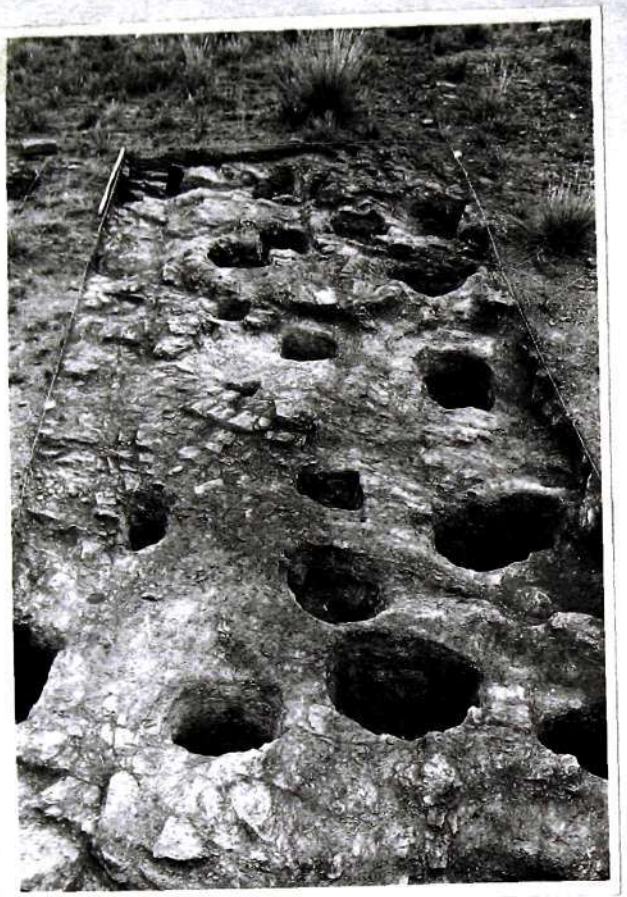


Plate 12: 1A,1B,1C, postholes completed. From S.

the postholes found do show the full extent of the building, the outline is closely related to the length of the paved area, and some of the postholes in the C squares.

This was not the end of the postholes. As the trench to the north of the paving extended into the eastern baulk, the squares to the east were opened up - 1A, 1B and 1C, to cover the probable area of building activity. Within these three squares were fourteen large and three small postholes, one posthole in 1A was filled with rubbish including the only whole beer or wine bottle from the excavation. Further work was carried out in 2A and 2B, to complete the postholes found on the north baulk of 2C, and more postholes and two small trenches were uncovered running north - south, along the eastern edge of the paving.

The three squares, 1A, 1B and 1C contained some features found nowhere else, apart from the number of postholes, and in general the bedrock was lower than in the nearby 2A, 2B and 2C squares.

Beginning from the north, in 1A the first clean over showed orangey-brown layer (2) over most of the square apart from the outcropping bedrock in the north-east corner. Although (2) remained in the south-west quadrant for some depth, in



Plate 1a: 1A, rubbish in Posthole 3. From E.

the north and down middle of the square it soon changed to (3) a darker brown with some charcoal (the post trench) while the south west area contained a patchy very dark brown deposit, (4) mixed with the remains of some layer (2). The post trench was soon excavated, and ended in posthole 1, with the outcropping bedrock to the east. There was no sign of the post trench turning south, but the line of the E. corner of the structure was well marked by post holes. The patchy black and brown deposits of (2) and (4) were bound by the post trench in the north and the line of postholes to the east, and was quite shallow. One unusual feature of the deposit was the discovery of three lengths of No. 8 wire, bent at right angles and driven into the underlying bedrock.

Posthole 1, marking the north east corner of the structure contained a soft brown soil indicating the area of the post, with a grey chip packing to the south and east. Nearly every posthole on this site contained this packing material, of small stones, obviously taken from the hole when dug originally. Posthole 2 was found south of posthole 1 while removing the rest of (3) and expecting to find another post trench. Again, charcoal and the soft brown soil indicated the original post position, with the grey chip packing around it. Posthole 3, slightly north east of 2, was covered with loose stones and contained a lot of rubbish and comparatively little soil. It must have been a mistake, refilled almost straight away; the discovery of such large finds, and so many, in one posthole was a great surprise as most produced very small and very few if any finds. The fourth posthole, near the southern edge was also covered by stones, and contained more small stones than usual within the fill - most of it appeared in the southern section. Another posthole, 5 was found, rather unexpectedly, just touching the south-west

corner of posthole 2. It was marked by some 10 centimetres of grey chippy fill on top of the usual soft brown post fill. The packing in this posthole contained orange soil as well as the grey chips. The complete excavation of this square was made more difficult by the presence of a thick, rather soft orange deposit (5), particularly obvious in the wouth-west corner. This seemed to be very closely related to bedrock, and although excavated in 1A, was left relatively undisturbed when found in 1B and 1C. Apart from the three lengths of No 8 wire mentioned above, and a small fragment of glass found near the top of the deposit, there were no finds.

In 1B, layer (2) was dark brown/black, obvious after the first clean over, along with light brown (3) and a very mixed whitish yellowy grey with chips, layer (4) beginning in the northern third of the square and continuing to the southern baulk, spreading towards the south west corner. All deposits were so mixed that boundaries were difficult to define, and during excavation it became more complicated as (4) appeared to be sandwiched between layers of brown/black (2). In fact the different layers of dark brown or black were very hard to differentiate.

Beginning in the middle section of the square, layer (2) was shallow and covered postholes 1 and 2, the first in the northern half, the second on the southern edge of the square, in line. Posthole 1 was quite deep, with the usual soft brown deposit from the post surrounded by grey packing. Posthole 2 was unusually shallow for such a wide mouthed hole, only some 25 cms. The removal of (3) in the north-east quadrant uncovered more of the dark charcoaly (2), obviously an extension of layer (4) in 1A - again both were shallow deposits. To the south of layer (2), the removal of layer

(3) uncovered more of layer (4) which extended into the western baulk in the south-west corner. The eastern quarter of the square was also a mixture of patchy dark and lighter brown along the edge of (4), with some of the dark patches extending underneath layer (4). Two more postholes were found in the eastern part, posthole 3 on the southern baulk and posthole 4 further north, more or less aligned with posthole 3 and the fourth posthole in 1A. Posthole 3 had dark brown soil near its surface, soon changing to the usual mid brown with small stones, and had a packing of mostly orange. Posthole 4 had some grey chip fill at the top, changing to mid brown and packing fill, and contained no artifacts. Further excavation in the western half uncovered two small postholes west of posthole 1, these were called postholes 5 and 6. By now the square was made up of postholes, bedrock and some of the soft, thick orangey soil, layer (5), as found in 1A, and was left.

The mixed yellowy-grey chip deposit, layer (4) in 1B continued into 1C as layer (2), very obvious after the first clean. This covered most of the northern part of the square except in the east and a brown patch in the middle. There was another, apparently separate area of this same deposit along the eastern baulk and a solid patch of black in the south-east corner, layer (3). Around the edges of (2) were patches of a dark brown/grey layer (5). A large number of nails and roofing nails had been found during the first trowelling of the square; these were left in place and planned. The next deposit of nails was also planned, and together show a large collection in the centre of the sqaure spreading mainly to the south-east corner.

The main area of (2) was removed first, and came down to the soft orange of 1A and 1B, with a suspiciously stoney area in the middle which became posthole 1. The small deposit of (3) was removed, proving it to be very shallow, and a further clean of the light brown (4) that covered most of the southern half of the square showed up some patches of pale grey along the southern baulk. These were very small and shallow and contained no finds.

In the centre of the square, posthole 1 appeared as much wider at the top of the bedrock than most others, but contained the brown fill in the middle, showing the post position, with a mostly orange packing. Just south and a little east of it, beneath the dark brown (5) and the greatest concentration of nails, was posthole 2, very large, almost double. To the west of it were posthole 3, somewhat smaller, and posthole 4 at the western baulk. More work in the eastern half of the square uncovered the southern edge of 1Bs posthole 2, and also that layers (2) and (5) were very mixed here, again similar to 1B. The removal of the rest of (2) along the eastern baulk uncovered posthole 5, and a final check in the north-west corner found a small posthole 6.

On plan, this bewildering array of postholes makes some sense. Posthole 3 in 1A can be ignored because of its apparent lack of use. This leaves a line of four postholes along the eastern edge of the squares - 4 in 1A, 3 and 4 in 1B and 5 in 1C. Next comes a line that could relate to the post trenches north and south of the paving - from posthole 1 in the post trench in 1A, through posthole 2, postholes 1 and 2 in 1B and posthole 1 or 2, or both in 1C. I would be inclined to chose posthole 2 in 1C because it is large, as befits a corner post,



Plate 14: 2B postholes in SW area, around edge of pavement. From W.

and fits in with the spacing of the other postholes. The three small postholes in 1B and 1C show no particular pattern, and it is possible that others could be found in the baulk between the 1 and 2 squares. Posthole 4 in 1C aligns with the southern post trench, which leaves posthole 5 in 1A and posthole 3 in 1C more or less in line, but for what?

The appearance of the four small postholes along the northern baulk in 2C indicated the need to explore this area more fully. Work began in 2B, which contained the south-east corner of the paving in its north west corner. At first, most of the eastern half of the square was very patchy, with orangey-brown (2), slightly darker grey/brown (3) and some grey ashy patches, (4). In the south-west corner the solid black (5), encountered from 2C to 5/6C, extended from the southern edge to the paving stones. Beginning in the eastern half, most of the grey ash, (4) was removed, without any finds, which left a patchy line for (3), running north south through the eastern side of the square, and another more continuous line a little further. At first it looked as if there were three or four postholes in the eastern area of (3), but they soon extended into a trench, extending from 2A into 2C. The other area of (3) also developed into a trench; this western trench was designated (3b) largely to keep the finds separate. There were no obvious post bases in the most easterly trench, but several appeared in or close to the second one. When the black (5) was removed in the south-west corner, it revealed another patchy area: a deposit of white gravel in reddish-brown soil in the corner, and patches of light and dark brown to the north and east. These patches turned into postholes and the second trench. (Plate 14)



Plate 15: 2A(background)2B,2C showing postholes and two small trenches in 2A and 2B, the most easterly of which should continue into 2C. From S.

Posthole 1 appeared as a dark brown patch with charcoal, became greyish-brown, and finally developed into the western trench. However there was a definite hollow in the trench, indicative of a post base, although shallower than most postholes within the post trench. The second posthole was slightly west, outside the trench, but the third posthole was north of the first, within the line of the trench, much deeper, and under the corner paving stone, which had to be removed. It was obvious that this second trench also extended into 2A. Meanwhile, back in the south east corner layer (6) was removed to uncover the northern halves of the two postholes found in 2C. Another two postholes were found close to the southern edge, in the middle of the square. Posthole 4 was quite deep and appeared at the point where the two trenches widened into one, and slightly north west was a slight hollow in the trench which could indicate a post hole, although no post remains were found.

By now it was obvious that 2A was incompletely excavated. The four postholes along the eastern and northern edge of the paved area needed further work; posthole 5 on the northern side had already been incorporated into the northern trench and now it was the turn of the old postholes 1, 2 and 3 to be incorporated into the two smaller eastern trenches. Posthole 1 disappeared completely into the most easterly trench, but postholes 2 and 3 continued, just slightly east of the main line of the second trench. Both trenches joined up with the main northern trench; the second, westerly trench joined the main one at posthole 4. (Plate 15).

As the postholes proliferated, it seemed possible that there

were several stages to the building of the store. Although there is no definite date for the appearance of a store at White Range, as mentioned earlier, I am quite sure that something would have been established very soon after the discovery of gold in 1898. The licence for the store was kept up until 1914, but because the period of occupation was so short, it is unlikely that the artifacts could help to date any building stage. However, I think it is possible to see some patterns which indicate three buildings, or three stages of development. It is also possible that more postholes could remain undiscovered, but I think this unlikely, except at the western end of the pavement where one square with part of the post trench, was unexcavated. To the east of the site the bedrock appeared as surface rock, or with a very light covering of soil, and a further extension of the structures to the east is unlikely. The baulks could contain some postholes, but with so many uncovered already, the buildings would have been very overcrowded with posts.

The paved area is not very closely aligned to the stone building, and I think the paving may have been earlier. The postholes in 2 to 5B and C not closely associated with the posttrench could indicate a separate structure, and if so, possibly the first store building. In the rush to take up White Range claims, the first business man could have put up a simple wooden building at first, and extended and improved his premises as time and money allowed. The first store might have had walls of canvas or corrugated iron and a roof of brush, canvas or iron. It is possible that the paving was put down next, as a good floor for the more perishable items. This would have taken some time to build, first collecting the right size and numbers of stone, and then levelling the ground. Although



Plate 16: (a) Pavement area, with little excavation done. From NW.

(b) Pavement with post trench and post holes almost completed. From NW.



I was usupicious that the larger paving stones across the 4A and 4B section pointed to several stages in the construction of the pavement itself, I think that if the larger stones were deliberate, they were used because a natural hollow in the bedrock needed filling, to level the ground surface. As I found when replacing the stones of 4A, it is easier to level up fewer large stones than several small ones.

One other problem with the paved area was that some postholes were found beneath the stones. Most of the postholes were quite large, and where it was possible to gauge the size of the posts from wood remains or stains, it was obvious that the postholes were larger than necessary. This may have been due to the rather soft bedrock, which tended to fracture and crumble around the edges, and might not have been a good support for the post. No doubt, it was safer to pack the posts with small rubble or a mixture of dirt and stones, and most postholes did contain such packing deposits. So it may have been possible for postholes apparently beneath the paving to contain posts that were set right at the edge of hole and paving. Another possibility is that the first structure may have extended out into the A squares, before the paving and post trench structure was built. This would explain the strange groupings of postholes in some areas, i.e. 4A, and those more or less under the paving. If so, the first store would have been quite large, almost 8 by 10.5 metres, which may have been pulled down or altered when the paving was laid down.

The postholes of 1A, 1B and 1C could be later additions. The most easterly line of four postholes may have been

hitching posts; most miners had a horse, and would be likely to ride when coming to stock up. This would leave the middle north-south line of postholes as the eastern edge of the structure. My main reason for suggesting an eastern addition at a later date is that a lot of roofing nails came from these three squares, which might indicate that this area was roofed with corrugated iron. Such roofing was expensive, and probably difficlut to get on the field, and the storekeeper may have had to wait until he could afford such material. Unfortunately a lot of roofing nails came from the 2C and2D squares, which does not support this theory entirely; and some roofing nails were found around the paving.

In effect, it is impossible to be sure of the order of construction. I think it reasonable to suggest that three stages were probable, even if the final building was completed soon after the original. Simply from the point of view of time involved, a wooden building could be put up quickly, followed by a more substantial structure over the paved area, and the very fine stone room appearing last. It is quite possible that all three buildings were retained; with loadings arriving every two or three months, there would have been a great deal of storage space needed.

The artifacts that helped support the identification of the A site as the store were the small rather mundane objects: pen nibs, the pencil rubber, and a very few paper fasteners. These are not very powerful supports, but the number of pen nibs suggests that they were kept in stock, or used for bookwork, and none have been found in the much larger area of the D site. The lack of vast

amounts of tin cans and broken bottles as found at WRD indicate a business rather than domestic use of the A site. A number of clear glass fragments, unusual in that all the pieces were flat, were found along the northern edge of the pavement. Some of the fragments are covered by a heavy white patination, but all were only 1.5 to 2 millimetres thick. At first I wondered if someone had put a window in one of the store buildings, but eventually decided that the glass was too thin, and must have been picture glass. Perhaps it covered a portrait of the King, or a Gibson Girl, maybe a print of the Stag at Bay.

I was surprised at the number of tin opener keys found over the site, but none of them had been used and obviously had fallen off the tins when being moved from the store. Most were found near the entrance to the stone building, or between it and the paved area. There was very little bone, wood or clay pipe fragments, and apart from several pieces of broken cooking pots, very little in the way of metal artifacts. The one Yale key came from 4C, and a lock plate and door hinge from 3F and 2D respectively. Generally there were fewer finds from the A site when compared with the D site. More detailed discussion appears in the section on artifacts.

Close to the WRA site, some eight metres east of the pavement, was a slight hollow, which I decided to investigate. When the grid was extended to cover this area, most of the hollow fell within two of the B squares, with the northern edge just into the A squares; they were numbered 10 (to the east) and 11, and 10B and 11B were excavated together. The deposits were quite straightforward - surface weeding and cleaning, a second layer of light brown soil, and a darker brown layer within the

hollow, Feature 1. In 10A and 11A only the hollow was excavated, and the darker brown deposit was layer (2).

The hollow proved to be a roughly squared circle, with very uneven edges and floor - possibly due to the soft friable bedrock. The deposit within it contained medium and small stones and gravel, as well as a high proportion of finds. Metal predominated, with tin cans (and many rusty fragments) tobacco tabs, wire and nails. There was one small concentration of wood in 11B, which may have indicated the position of a post, but the remains were very slight. There were no further clues to its original purpose, but it seems to have ended life as a small rubbish dump.

Slightly north east of the A site was a small chimney, very tumbled down, with a paved floor in front of it. It is possible that this was the home of the store keeper or manager, and was remarkable for an enormous scatter of rubbish to the west, north and east of it (the chimney faced south). It may be unfair to blame the inhabitant for all the rubbish, as there is some chance that one of the waggon tracks went from the store close by this structure and thence north east. Although it was not possible to look at the chimney area very closely, it was decided to investigate some of the rubbish scatter.

The site was designated WRG (two other small areas had been considered, as a check on the larger sites of A and D, but largely abandoned) and four two metre squares were laid out some 18 metres west of the chimney, on a north - south axis, with 50cm baulks between them. Only the surface finds were picked up, and the area covered only a very small part of the whole. The area covered in rubbish was mostly flat, except for a steep drop slightly west of the squares laid out. Although incomplete, the finds can be compared with those from the WRD dump; the amount of material from both areas made a complete comparison difficult, but the glass from both has been fully documented. On the whole there were fewer unusual glass artifacts from WRG, but this may be a result of the ease of access to casual visitors, who might pick up an interesting base, even if the bottle was broken. The WRD dump glass had the advantage of a good cover of rusty tin cans, which may have deterred all but the keener bottle hunters.



Plate 17: (a) The slate remains of the billiard or pool table.

(b) WRD general view from W, structure D in foreground, right, with chimney of Structure A behind it, then the "fireplace" of Structure B, and the isolated low stone "wall" of Structufe C in middle background.



WRD - Patrick O'Neil's Camp

Structures A, B, C, D, E, F, and G and Rubbish Dump.

This site was chosen in the hope that it would be a miner's camp, containing different information from that of the Store site. After two seasons of excavation, it was obvious that the buildings were too complex for an ordinary hard-working miner. The vital clue to identification came from the scatter of broken slate found mostly on the surface all over the site. I had not been able to think of any good reason for its presence, apart from a butcher's table, until a helpful visitor mentioned that billiard tables were made with a slate bed. Another look at the slate fragments revealed some with counter sunk screw holes and curved edges for pockets. Finally, with some help from Mrs. Jose Petrick of Alice Springs, I was able to discover that one Patrick O'Neil was issued with a billiard table licence in September, 1903. This was the boom year for the Arltunga and Winnecke's Depot goldfields, which encouraged much business speculation. None of the proposed hotels were built, and O'Neil was the only person issued with a licence. He must have been an optimist - the problems of bringing a billiard, or more probably a pool table, overland from Oodnadatta must have been enormous.

The identification of the D site as the camp of Patrick O'Neil helped in the tentative identification of some of the structures making up that camp. I was fairly sure that Structure B was a kitchen, but not so sure of the low stone walled Structure D. The suggestion from some visitors to the site was that this was an open summer kitchen, without proper walls and just a bough roof, if any. Apparently it

was the custom in the early days to have such kitchens for use when it was too hot to cook inside a building. I thought it unlikely that a man would worry too much about cooking in summer with the amount of tinned food available, and was sure that a woman was associated with the site. Much to my delight, the records showed that Elizabeth O'Neil, married woman, was at the White Range between 1903 and 1909, and it is reasonable to presume that she was Patrick's wife. She was one of only three women recorded at Arltunga during this period.*

It is possible to divide the D site structures into two groups, domestic and work, with the "Billiard Room" somewhere in between. Structures A, C and D seem entirely domestic, i.e. cooking and eating, living and sleeping areas, while structures E, F and G made a small work area of forge, ash pit and shed. Structure C I presume to be the billiard room - it is by far the largest room, and I think the only one capable of holding the table and the men playing it. This room may have been used for living/sleeping quarters when the table was not in use.

The domestic area

The three structures making up the domestic area were aligned on flat ground above a slope which continued down to a small dry creek bed. The slope was particularly steep south of structure D, almost a miniature cliff face,

* More detailed information about the O'Neils appears in the historical introduction, page 47.

which flattened out behind and south of structures A and B. The latter structures were only a metre or so apart, whereas the hot weather kitchen was four metres west of structure A.

Structure A, fireplace and paved floor, living area
Squares 19, 20P; 19, 20Q; 19,20R.

The fireplace and paved area indicated some sort of living room of quite substantial proportions. The paving, some 3 by 2.5 metres, extended north from a fireplace 2 metres wide, and still standing to a height of one metre.* The main reason for excavating around the pavement was to find out what sort of wall construction had been used. I was expecting a slab post wall, but we found a series of postholes, irregularly spaced out around the paving.

In squares 19 and 20P and 19 and 20Q, the first layer covered the weeding and surface finds, while the second layer contained finds from within the top 1cm. of soil, removed in the first cleanover. Layer (3) was a dark brown deposit, following the edge of the pavement, quite shallow apart from the postholes found within it, and containing a lot of small stones. These may have been used as packing for the posts. The postholes were small, usually

---

*The difference between a fireplace and a chimney is not very clear; the Oxford Dictionary defines fireplace as "a place for a fire, especially the open recess at the base of the chimney appropriated to the fire; a hearth". A chimney is "a fireplace or hearth", with emphasis on "the part which rises above the roof." For my purposes, considering the delapidation of most chimneys at the White Range, fireplace is probably the better word to use.



Plate 18: Interior of Structure A, pavement and surrounding post holes in 19 and 20P (Left) and 19 and 20Q. Fireplace out of picture to the right; part of 20R in top right corner shows some of the fallen stone found over the paved area. From W.

under 20 cm. in diameter, set very close to the pavement and quite often placed in a gap left in the edging stones. The postholes were slightly darker in colour than the surrounding deposit, and the soil was looser than in (3).

Outside layer (3) was a filling deposit of whitish-yellowy brown rubble, layer (4) and almost sterile. This extended along the eastern side of the structure, from 19R (where it was layer (3)) through 19Q and 19P, almost one metre wide. It turned west and continued across the northern edge of the pavement in 19P and 20P, where it narrowed down to 20-30 cm. wide. The deposit was not obvious along the western side, possibly because of the small bottle dump in 20Q and 20R, which had probably been disturbed over the years.

The setting in of some postholes, into the pavement, and the shallowness of the layer (3) deposit seemed to rule out walls made completely of wood, although a flimsy brush wall could have been possible. The later excavation of squares 19R and 20R produced some more substantial clues. The line of the paving in these squares had been a little blurred by the partial collapse of the chimney, and all the fallen stone had to be removed. It was then obvious that the paved area extended out at right angles from the fireplace, with corner posts at the SE and SW corners of the paving. Even more interesting, the final postholes were found right against the two arms of the fireplace, surely a most dangerous spot for any posts. This would rule out any timber walling, and canvas might have been dangerous too. The two postholes in 20R provided the answer. Posthole 1, adjacent to the western arm of the fireplace, retained part of a length of corrugated iron,

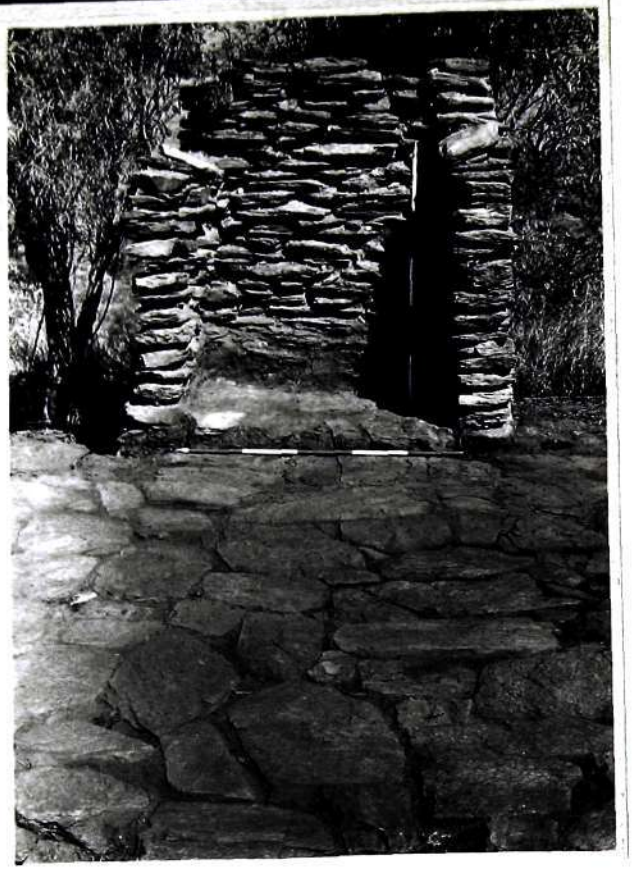


Plate 19: Structure A, most of paved floor and chimney cleaned out. From N.

which was placed vertically down the eastern side of the posthole. Another, similar length of tin was found set vertically along the southern edge of the post trench deposit (3), from posthole one to the corner posthole 2. I had thought that the ordinary miners would not be able to afford corrugated iron for building, but as further research proved, this site was not inhabited by an ordinary miner. The lack of corrugated iron above ground can be explained easily enough: such material was expensive to bring to the area, and would have been re-used by later visitors to the area. Another length of iron was found when clearing up the fireplace area. Although the remains are slight, I think they indicate walls and possibly a roof of corrugated iron for this structure.

Quite a lot of stone and mortar had fallen from the chimney walls into the fireplace, and when cleaned out it was found to be a plain hearth, slightly raised above the paved floor. There were no signs of internal ledges as seen in other fireplaces, but one substantial length of slightly charred wood found within the debris may have been the remains of a lintel post. Some of the paving stones in front of the fireplace had collapsed slightly, which encouraged the idea that there may have been a secret "safe" under the floor. This did not seem very likely, but one of the smaller stones was removed and it was felt that the collapse was probably due to the weight of fallen chimney stones onto the paving, with the extra pressure affecting the underlying fill material.

Comparatively few artifacts came from within the structure, the paved floor making to easier to pick up anything dropped inadvertently. But the surface finds from all the relevant squares contained masses of broken glass, often heat affected.



Plate 20: Structure A pavement in foreground, with Structure B fireplace background right. The dark feature of the slab post trench of B shows up running across 18Q and then turning east in 18 and 17P. From W.

flattened tins, tin ends and lids, many nails and some clay pipe fragments. As with structure B, some of the metal parts of a lamp were found, including a very nice regulator. Part of a hinge was found in 20Q, but no other keys or locks; such things seem to have been confined to structure B and the area between structures A and C. Several fragments of very rusty fine wire mesh were found, some quite large, again scattered over structure A and B; very probably from a food safe of some sort. Two tobacco tabs, a button and a possible hairpin add to the picture of domestic use.

The area between Structures A and B is discussed after this section on the "domestic" structures of the site.

Structure B, kitchen? Squares 17, 18P; 17,18Q, 17,18R.

The existing stone structure here was unusual in that it was rectangular, with a solid base and signs of three higher walls to east, south and west, around a hollow. The amount of fallen stone made it difficult to be sure of the original height and construction. The remains were situated within square 18R, but work began in the squares to the north, starting in 18Q. This proved to contain a very mixed deposit and soon, very obvious signs of a post trench, still containing some of the posts below ground surface. This trench ran across the square towards the north east, continued just into 18P, where it turned eastwards, running along the southern edge of both 18P and 17P and turning back south into 17Q. It continued into 17R, turning towards the west in the middle of that square and continuing immediately south of the stone structure in 18R. At the south west corner of the stone remains the trench turned north to meet the previously excavated area of



Plate 21: 18Q, post trench, with post remaining in south section. Deposit on either side of trench is the light fill material. From N.

17Q. The southern, trench had two deep postholes marking the eastern and western corners, and much of the trench was shallower here than anywhere else. Most of the post remains were found along the western and eastern "walls" and were very burnt on the upper surfaces; it is quite possible that whatever wooden building stood here was destroyed by fire. Another feature of this area was that within the post trench there were considerable signs of burning in front of or north of the stone remains. Most of the interior, particularly in 17Q and 18Q was a mixture of black and orange clay, so burnt that the underlying bedrock was blackened too.

When 18Q was cleaned over, the square showed a loose brown soil in the eastern third, layer (3), a mixed light and dark grey with some brown soil and some charcoal, across the middle, layer (5), and a yellowy-white rubble deposit in the west, layer (6). The brown layer (3) was the remnants of the naturally deposited topsoil, most of which was removed during the first clean as layer (2). When all the brown had gone, we found in the north east a small, roughly rectangular area of bright orange, layer (4), very shallow, extending from the northern and eastern baulks. Beneath the rest of (3) was another mixed dark grey and brown layer, similar to (5). This was left while the broad band of layer (5) was excavated. Along the western edge of the deposit the post trench was uncovered, containing some post remains. Archaeological deduction made easy! The trench was some 10 to 20 cms. wide, varying with the size and positioning of the posts. To the east of this trench (5) covered a whitish-yellow deposit, very similar, if not the same as the rubble deposit found west of the post trench, layer (6). Similar deposits were found either side of the trench in other squares, and around the outside of Structure A. It must have been a filling deposit; a large trench was dug for the clay plugged slab walls, and when the posts were in position, a lot of the trench had to



Plate 22: 18Q, top of post trench, with posts as they first appeared, in southern part of trench. From E.

be backfilled to support the walls. The size of the original post trench may have been so large because of the softness of the bedrock, which might not have given sufficient support to the walls. Very little of this rubble deposit was excavated.

Then the patchy layer (5) over the rest of the square was excavated. It proved to be a very shallow deposit, containing quite a bit of orange clay, just on top of bedrock. The north east corner which had contained the slight layer (4) continued to provide unusual deposits. When layer (4) was removed there was a very black patch over another small deposit of very hard-packed yellowy-brown, layer (7) and sterile. In the middle of the square, east of the post trench fill and under the darkest part of layer (5) was a layer of reddish brown soil immediately above the bedrock.

The post trench contained post remains, concentrations of charcoal where posts once existed, very dark brown soil and lots of lumps of clay, presumably the packing between the posts. It may be possible that the very obviously burnt areas, especially in 17Q and 18Q, inside the post trench show that some of the walls fell in during a fire. This does not explain the archaeological deposits over the burnt areas; another possibility is that the somewhat uneven natural floor had some of the hollows filled in with clay or even just dirt, that became very compressed with use. If the structure was used as a kitchen, some of the burning may have been the result of a domestic crisis.

In 17Q, layer (3) was dark grey/brown with charcoal, the

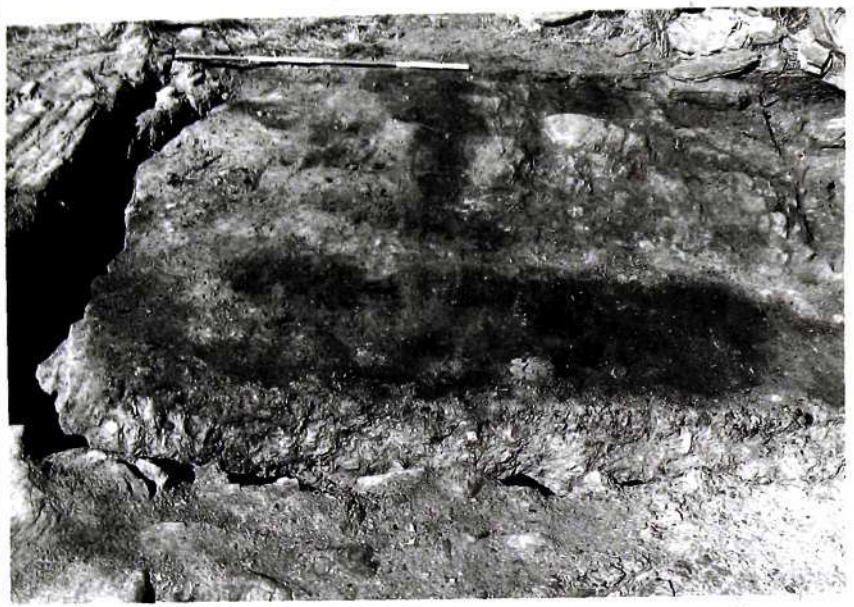


Plate 23: 17Q "interior" showing patchy deposit of black (6) and orange (4). From N.

deposit spread over the top of the post trench, layer (4) was an orangey mixed deposit, some lying over (3); layer (5) was light brown, similar to 18Q (3), and (6) was very dark brown beneath layer (5). This square contained only the eastern wall of the post trench, as the northern wall was just outside, in 17P. Once the brown (5) had gone, most of the square, apart from the post trench, was covered in patchy black and orange, on top of the bedrock. The orange, (4) and black (6) were so intermingled that it was impossible to separate them, or the few finds. Both deposits were very hard and often came away in large lumps; again the deposit was very shallow. The post trench was much the same as that in 18Q, but the most easterly wall was rather more straight than in 18Q, having been dug into a solid outcrop of bedrock which appeared at the edge of 17Q.

The north wall of the structure appeared along the southern edges of squares 17P and 18P. In 18P the post trench only was excavated, to find the north west corner of the structure, and the turn towards the east. The trench was not quite continuous - there seemed to be a rather narrow gap, possibly for a doorway, between the corner and eastern edge of the square. The trench continued into 17P, following the southern edge of that square, and turning south in the south east corner. The deposit within the trench was the usual soft very dark soil, containing clay lumps and charcoal, but few post remains. To the north of the post trench, in both squares, was a filling deposit, similar to that found in 18Q.

The excavations in 1979 completed the work on this structure, in squares 17 and 18R. In these squares there was less of the mixed black and orange deposit found in both 17 and 18Q, largely



Plate 24: 18R, the "fireplace" as it stands now. From NE.

because the stone "fireplace" took up most of the interior, especially in 18R. Here there was a narrow deposit, only 1.50 metres wide, between the north face of the "fireplace" and the northern edge of the square. (I use the word fireplace as it is easier than repeating the "remaining stone structure" in every second sentence. I do think that it was used as a cooking fireplace.) Within this narrow area, the usual mixed deposits appeared. The post trench deposit, layer (3), obtruded from the eastern edge of the "fireplace"; west of it was a small area of fine dark brown soil, (4), with a patchy dark grey (5) extending west of layer (4) to the eastern edge of the square. Layer (5) contained some areas of clay, as found in other squares, and extended into 17R as layer (4), ending at the eastern wall of the structure.

In 17R the deposits were complicated by the number of loose stones in the middle and western part of the square, which had fallen from the "fireplace". After the initial weeding and cleaning, layer (2) appeared as a dark brown deposit over most of the square, but with the addition of tiny circles of crumbly pale orange, labelled (3). When these layers were removed, layer (4) appeared along the northern edge, from the western baulk, to the beginning of the post trench deposit, layer (5). To the south of (4) were the loose stones, and when the top layer of these was removed, a fine light brown deposit, probably fallen mortar, layer (6) was uncovered. More of the stones were removed, along with layer (6), and underneath was another mixed deposit, very hard packed (possibly caused by the fallen stone) of grey and black, layer (7). When layers (4) and (7) were excavated, a uniform reddish brown layer (8) extended across the interior of the structure. Beneath this was a whitish-yellow fill deposit above bedrock.



Plate 25: 18R, posts in post trench, right against the west wall of the fireplace. From W.

The post trench deposit, layer (5) was similar to that of the other squares, and still contained some post remains in the northern part of the trench. However, it changed dramatically at the south east corner, which was marked by a deep posthole, and where the trench turned west, to make the southern wall, it was very much shallower than anywhere else. As it continued towards the western edge of the square, it became deeper, but with no greater indication of post remains than the brown wood stained soil which shows up in the eastern section of 17R. The trench continued into 18R, right against the back of the "fireplace", and the south west corner was marked by a deep posthole, similar to posthole (1) in 17R. The northerly turn of the post trench, still hugging the western edge of the "fireplace" was a return to the more usual post filled trench, in a line from the corner posthole to the northern edge of the sqaure. If the stone remains were used as a fireplace, the walls must have been very thick, to protect the slab walls so close.

One of the problems with structure B is that there is no well defined doorway. There is one possible gap in the corner of 18P, but it seems very narrow, and the other possibility is near the south east corner, in 17R, where the post trench was very shallow. The difficulty with both positions is that neither relates very closely to structure A, which I presume to be a living/sleeping room associated with the kitchen. Perhaps all the eating was done in the kitchen, at least in the winter, which would explain the lack of direct access between the two areas.

The artifacts seem to support the theory that this structure was a kitchen. The only large amount of earthenware found on the site was associated with the structure. This was



Plate 26: 18P and 17P, northern wall of structure B, with possible entrance at the north-west corner. From W.

reconstructed as a large jar, mostly grey glazed, with a brown glaze on the upper body, which probably held wine or whisky. All the fragments of earthernware found scattered over the D site were part of the same jar, and within the structure, fragments were found in deposits from the surface to bedrock, another indication that most deposits were laid down very close together. Some lamp glass, and various metal lamp components were found within the structure, in 17Q, 18Q and 17R (and similar pieces were found associated with structure A, in 19 and 20Q). The glass fragments were numerous, and many were misshapen and affected by heat. Several flattened tins, and tin ends were found, and part of a mincer; I was told that goat's meat was very tough, and that mincing would be the best way of dealing with it. Two padlocks indicated a need to secure foodstuffs, as mentioned in the historical introduction. Nearly all the roofing nails on the D site were recovered around structure A and B, which I think indicated that the roofs were of corrugated iron. A surprising number of tacks were found in 17R, but I am not sure of their significance.

Structure D, outside kitchen? Squares 22-23R, 22-23S

This low, loose piled stone structure still retained its square shape despite the collapse of parts of the walls, mostly on the southern side. The present height varies from 45 to 70 cms., and the walls may have been approximately one metre high originally. The main entrance seemed to be at NE corner, with another gap mid west wall. Quite a few stones had collapsed into the structure, so work began there. On the grid plan, 23S covered most of the interior, which was little more than 1.50m square, it was decided to catalogue all finds as from 23S.



Plate 27: (a) Structure D before work began.

(b) Structure D cleaned, some fallen stones still remaining. The dark brown shows up in the SE corner, and patches of whitish-yellow in western half. Entrance on left, in NE corner. From N.



During the first clearing and removal of fallen stones, it was noticed that large fragments of several bottles were coming from the SE corner. Other unusual finds included the metal part of a spade handle and a slightly squashed tin of the "new" type, complete with label. It was possible to piece together most of the bottle fragments to make 3 almost complete bottles: one green, one pale green and one blue rectangular Clarke's World Famed Blood Mixture. This was the only time that such conservation work was possible within the excavated areas, and was helped by the bottles being distinctly different, and most of the fragments being large. Another point - the finds were concentrated in the SE corner, with very few coming from the northern side of the interior. With the entrance at the NE corner, this would have been a passage area, where one would expect to find only smaller fragments.

The first clean over produced quite a variety of deposits: an ashy, charcoaly dark brown in the SE corner, and a fine whitish-yellow deposit in the SW and NW corners, and a mixture of grey (3) and orange in the western half. The eastern half mostly contained a light brown deposit, which became more orange close to the walls. This, and the whitish-yellow deposit were very similar in texture to the mortar remaining in the walls. Quite a lot of the mortar has been leached out, so it is not surprising that some have been deposited inside the structure.

Because of the cramped conditions within the structure, and the variety of deposits, the area was excavated in spits, keeping the finds from the different deposits separated as much as possible. After removal of the second spit, the



Plate 28: Structure D completed. From N.

charcoaly dark grey remained in the SE corner with other scatters of charcoal along the eastern wall (this remained so through to bedrock.) In the western half of grey ashy deposit had become widespread, with a dark charcoaly area right in the SW corner, plus two unusual squarish stones opposite the gap in the western wall. The NE area was mostly brown merging to orangey-brown (2) - changes between deposits were difficult to detect because of fallen stones within the layers. The next spit removal produced a colourful mixture in the western half: the ashy grey continued, but it now contained small scattered patches of bright orange, large areas of pale orange, and quite a lot of charcoal. This was scattered from the middle of the south wall in a curve avoiding the SW corner and extending just into the NW quadrant. Some of the charcoal near the SW corner was so dense, and contained wood fragments, so was called layer (5) - possible post remains. Further investigation showed that (5) became a dark grey deposit, overlying an unusual reddish orange that eventually was shown to cover all the SW quadrant.

In the NW quadrant the deposit was now mostly pale orange with patches of grey, but further excavation showed that the grey and orange were very mixed up. Finally the grey prevailed, covering most of the square just above bedrock. The rock surface was fairly flat and even in the northern part, but much more corrugated in the south, with the SE corner quite a bit deeper. This corner may have contained a post, which could relate to the possible post in the SW corner.

Another feature of this structure was that the two squares to the west contained a great mass of fine grey ash, which extended almost three metres to the west and beyond the NW

corner of the wall. Within thsi grey ashy deposit were a large number of finds, especially in the area closest to the gap in the western wall: lots of nails, and several clay pipe fragments. Such pipe fragments have been rare on the sites, but nine were found associated with this structure. A large number of buttons were found, too, a well preserved small buckle, and a small metal fork with wooden inlays on the handle.

It seemed likely that the stone foundations could have been the base of a small store room, and this was reinforced by the discovery of the unusual bottles, a number of tin cans, etc. However, the appearance of so much ash, not only within the structure, but spreading west in a thick deposit raised other possibilities, as did the number of clay pipe fragments found. I wondered if this was a smoking room, or if someone had set fire to it while having an illicit smoke, but a more likely reason was given by visitors to the site, who were quite positive that it was an outside kitchen. As mentioned in the introduction to the WRD site, it was quite common in pioneering days to have such a kitchen, without proper walls, for use during the very hot weather when cooking inside any walled and roofed building would be almost impossible. I understand that the appalling bushfires of 1939 in Victoria were started in one area by someone boiling his billy outside, because it was too hot in his little shack.



Plate 29: Structure C, general view from the NW. The eastern stone "wall" is in the background, and the dark feature of the west wall and some of the south wall appears in the foreground.

Structure C - the "billiard" room Squares 16, 17P, 16-21N, 16-21M, 16-21L, 20 & 21K.

The outline of this, the largest structure on the D site was not fully realised until the 1979 season. The original 10 by 12 metre area opened up in 1978 had taken in most of this structure because of the unusual built up floor in squares 16, 17 and 18M, and the low, loose stone "wall" extending through 16L, M, N and P. At first I was not sure if the "wall" related to a structure to the east or the west of it, but further excavation showed that the structure lay to the west. Apart from the stone "wall" at the eastern end, the building was of timber, but slightly different from the structure A building. This time the postholes were set out in a double line, and the smallest posts were positioned close together - twin posts. These small posts were barely 10 cm. in diameter, while the larger single posts varied from 15 to 40 cms. There were difficulties during the excavation of these postholes - one was the narrow opening, which made working in gloves difficult, but the frequent appearance of spiders within the postholes made the wearing of gloves advisable. The room was large, some four by almost ten metres; the stone "wall" may have been added at the eatern end for protection against the prevailing south-easterly winds.

It was while working in square 19N, where two small postholes were found, that the full extent of the structure was realised. The posthole and post remains in 19N reminded me of similar small post remains found in 17P, close to the western end of the southern section of the "wall"; by lining up the two sets of posts, the line of the southern wall could be envisaged. As the southern line was more or



Plate 30: Structure C, western wall, from 21N in the background to 21K. From N.

less parallel to the built-up section in 16-18L, all that remained was to find the western line, and fortunately this appeared in the westernmost squares of 21N to 21L. The north west corner was just outside the original area, but was found in 21K. The approximate lines of the building were made quite clear by the very dark brown or black deposit, some 50 cmm. wide which covered the postholes and post remains. This deposit was very shallow, barely 2 cm. deep in some places, and no more than 7 cm. (Plate 30)

From 19N the post deposit was followed to the south west corner in 21N, then along the western side to the north west corner in 21K and back through the L squares to the eastern low stone "wall". The deposit remained the same in all squares - very dark almost black soil, soft, with scattered patches of light grey ash and some charcoal. The postholes were easy to see - all had concentrations of charcoal just below the present ground surface, or the post remains. One small posthole, the third in 21M, was very small, but some 2-3 cm. from the bottom, just below the last remains of the post a long heavy spike, or very large nail had been driven into one side of the posthole, with the end jammed into the other side. The spike had been bent into a right-angle, with the lower half hidden in the side of the posthole.

In 19N, 20N and 21N, through which most of the southern wall of the structure ran, beneath the post deposit layer (4) stones were found, obviously set into the underlying soil. These "foundation" stones were not very large, but were not found along the western or northern walls, except as extra packing around the postholes. The post trench deposit was

Plate 31: Structure C, north wall, with built up area in 17N quite clear.

most obvious in 20N, 21N 21M, 21L, 21K, 20L and 19L becoming less clear than in the eastern part of 19L, and also in the eastern part of 19N. Along the northern wall, in 18 and 17L, the scatter of surface stones and the presence of the small retaining wall may have prevented the amount of soil discolouration from fallen timber that occurred in other areas. The depth of the deposit is too small to indicate a timber wall foundation, but posts, or more likely roofing timbers could have fallen along the line of the deposit. Another possibility, with the double row of postholes, is that wattle walls, of loosely woven small branches were used, which would have helped to cool the room, and would have left little evidence in the soil.

Not all the southern wall was excavated, but there were few surface indications in 18N and 18P, but somewhere in that area would have been the best position for a doorway, close to structures A and B. This would have not been so suitable for any public use, and I wonder if this room was built in two stages, the eastern half first, extended to the west to cope with the business engendered by the billiard table. The eastern half is more substantial, and along the western edge of 18M, in the northern corner, a group of stones included one set on edge into the ground. A similar but more obvious line of stones, set on their sides, was found along the eastern edge of 17M, also in the northern corner, and close to a posthole. These stones may have been positioned as extra support for the fill material found inside the structure, especially in this eastern area. The flat stone packing in 19-21N may have been put down to help contain the interior fill, as well as support the posts, or may indicate a different walling material used in the western half of the room.

Comparatively little of the interior was excavated, but it was obvious that it was largely made up of an artificial fill material, similar to that associated with structures A and B. While the natural ground surface was relatively flat in the western part, it have been necessary to build up the eastern end quite considerably, and to hold this in place with a line of retaining stones stretching from the eastern stone "wall" through squares 16, 17 and 18L.

At the eastern end squares 17M, 17N and 16N were excavated - the first two down to the fill deposit and 16N to natural. The latter was excavated in 1978, before the full significance of the structure was realised.

In 17M the initial surface collection and subsequent clean over had left several very patchy, ill defined deposits, with large areas of the underlying fill showing up. A small rectangle of brown soil, layer (3) appeared in the SE corner, with dark brown, layer (4) beneath it. Another very shallow deposit of dark brown, layer (5) was less easy to define, but from the middle of the southern edge of the square it spread almost to the middle, before turning west and continuing into 18M. There was a smaller spill of this deposit in the north west quadrant; another separate but similar deposit occurred right in the NW corner. The deposit was very shallow, barely 1 cm. deep. A small area of dark brown in the middle of the north baulk layer (6) was thought to be the beginning of a posthole, but petered out into a small hollow. However, a posthole was found, rather unexpectedly on the eastern edge of the square, which seems a rather awkward position, some 50 cm. from the inside of the eastern stone "wall".



Plate 32: Structure C, eastern stone "wall" in 16M and N. From N.

The adjoining square to the south, 17N, presented a similar appearance - very shallow indistinct dark brown or black deposits over the filling material, with bedrock apparent in the south. Here the shallow dark deposit was layer (3) and the brown was (4).

16N was one of the first squares excavated on the D site, and contained a variety of deposits. The deposits were complicated by the stone "wall" running through the square, dividing it into an eastern, or outside half, and the western or inside area. The first two layers were divided into a and b to differentiate between the two: 1a and 2a east of the wall, 1b and 2b west. The eastern half was excavated first. A dark greyish brown deposit, layer (3) appeared as two distinct patches east of the "wall", but the edges were difficult to define as the deposit merged into a slightly lighter brown along the northern edges, and underneath. Layer (7) lay east of (3), and layer (6) beneath, and all three were difficult to delineate, (7) being slightly lighter brown than (3), and (6) being a medium brown. Along the eastern edge of the "wall" was a very distinct layer (4), of pale orange brown, very shallow, which may continue under the "wall", and extended over the western edge of layer (3). The deposit continued into the northern baulk, but stopped short of the southern edge of the square. Another deposit that was clearly seen was a small ashy layer (5), on the southern edge of layer (3). Again, this was very shallow and partly covered some wood, 15cm. square; this may have been from a box as the wood was very thin and fragile. Beneath layers (6) and (7) the soil was the orangley brown rather soft decomposing rock found all over the site.

On the western side of the "wall" the deposits were packed

into a small space - just the easternmost quarter of the square. Once the remains of the surface soil, the orangey-brown of layer (8) were removed, in the south was a patchy orange and pale grey ash deposit, layer (9). When the suface ash and orange were removed, the deposit changed slightly, with grey ash mixed with dark brown soil; this did not continue to the eastern edge of the square, as a light yellow clay like deposit, layer (10) was found there. North of (9) and (10), in the middle of this area was a dark brown soil, layer (11) with most of the northern part covered in a light brown deposit containing some charcoal, layer (12). Some patches of dark brown, in the north west corner and close to the western side of the "wall" became layer (13).

The deposits were complicated by the "wall" running through the square, and there was no time to remove a section of the stones to check the continuity of deposits from one side to the other. However, I am sure that this was the case for some of the deposits, i.e. (3) and (13) were very similar, as were (11) and (6). The ashy layer (9) continued into 17N where it was layer (3) and was related to the patchy dark and ashy areas in that square and in 17M as the less ashy layer (5). The very patchy nature of the deposits make it more difficult to relate deposits in other than adjoining squares. As it seems very likely that this structure was the "billiard room" and probably built in 1903, all the deposits must have occurred within six or seven years (the last documented appearance of the O'Neil name is in 1909). All the deposits were very shallow, apart from the fill material which was not tested to any depth, which leads me to believe that the structure was comparatively flimsy one, possibly of posts and canvas. The concentration of broad headed tacks

may support the use of canvas, and two of the canvas rings came from 19N (out of 8 altogether).

Other finds of interest were a scatter of finer pottery than the earthernware jar of structure B, although not enough was found to piece the fragments together, and in the eastern part of the structure a few most unusual metal objects, quite small, some 4cm. long, of two parts, probably some sort of device for holding material together. Description is difficult, and I have not been able to identify them yet, but the photograph facing p152shows them in detail. Otherwise, there was a lot of broken glass, particularly on or near the surface, and much of it heat affected, and the usual nails, tin can fragments, wire and the occasional tobacco tab.

The area between structures A and C produced some very interesting artifacts - it is often the case that the majority of finds come from the edges or exterior of living areas; it is usually possible to keep the interior swept and clean. Less work was done on the area between structures B and C, so the area of interest is 19-21N and 19 and 20P. The southern half of all three of the N squares contained patchy light and dark brown deposits with a scattering fo charcoal and some area of grey ash. This was designated layer (3) in all three squares. The deposits in 19 and 20P were more clearly defined, in this exterior area.

In 19P the two deposits in the northern half of the square were a dark grey/brown layer (5), containing charcoal in the west, with a mixed pinkish brown, layer (6) to the east. It soon became obvious that (5) continued underneath (6), so the

latter was removed entirely to show (5) extending from the middle of the western baulk across to the eastern and northern baulks except in the two corners. In the north west corner the brown (6) seemed to dip deeper, while in the north east corner the underlying natural was exposed. Layer (5) was only shallow and when removed, the natural orangey-red decomposed schist was found. The deposit had spread a little over the filling material around the edge of structure A; this may have been caused by use of the area as a passage way, and because the deposit was slightly later than the construction of that structure. In 20P, the dark grey/brown layer containing charcoal was layer (4) and continued from 19P towards the middle of the square, ending more or less in line with the paved area. Towards this western edge of (4) the deposit was very shallow, barely 1cm. deep, and had been overlaid by the patchy brown and orange of layer (5) which covered the rest of the square i.e. the western quarter, not taken up by structure A.

From these deposits the unusual artifacts were: a cold chisel and wedge for splitting rock, found very close together in 20N (3); that part of a door fitting and lock that is attached to the wall from 21N (3), and from 19P (6) the metal part of a paint brush, which holds handle and bristles together. The chisel and wedge are tools that could have been used for mining or during construction of the various rooms of this camp, and unless they were lost towards the very end of the occupation, it is unlikely that they were used for mining, as such tools were essential and possibly not always easily available on the goldfield. Besides, the mines were some distance from the settlement area, and it is unlikely that even the comparatively small, light tools were carried from

camp to mine every day. Most mines had small rough stone structures close by, probably used to store the necessary tools. The lock part and paint brush are most interesting, showing that at least one of the structures had a stout lockable door, and the paintbrush indicates the use of white-wash at least. Again, if the brush was used, it could be another clue to the presence of a woman at this camp, although that may be considered a female chauvinist conclusion.

The very recent and chance discovery of a photo of a miner's camp in the MacDonnell Ranges shows an ordinary tent with what looks like a line of stones around the base. This may have helped anchor the tent and afford some protection against animals - the ground is often very rocky, which would make knocking in tent pegs difficult. It may be that the east "wall" of Structure C was adapted, if canvas was used there.

The work area

The three structures at the eastern side of the site, on top of the slope down into the gully, can be considered as a group. Structure E was a forge fireplace, with Structure F just south of it, the pit for ash from the fireplace, and Structure G, east of E, probably a shed for storing tools, etc.

Structure E, the forge fireplace Squares 14S, 15S, 14T, 15T

This structure was identified by one of the volunteers in 1978, Morric Stockdale, and subsequent investigation made the identification positive. There are many such forge fireplaces scattered throughout the settlement and mine areas of the White Range. Most of the forges are associated with the mines, and of the four found in the settlement, this one at the D site is most closely related to a domestic site well away from any mine. Two others are associated with unusual stone remains which may be blacksmiths and/or teamsters working and stabling areas. One possible explanation for the forge at the D site is that it was built towards the end of the mining period, when the blacksmith or smiths had left the White Range.

The forge was solidly built of stone some two metres square, its present height varying from 60 to 85 cm., situated on a slight slope. There has been a certain amount of displacement of stones, particularly down the slope on the southern side of the forge. It is quite possible that the front, or southern face was as high as a metre or more. There was no time to check the actual construction of the forge, but some

excavation was carried out around it. This was fairly superficial as the forge had been built almost directly upon bedrock, but I wanted to check for any signs of a light wooden superstructure, such as was seen around one of the forges amongst the mines. No signs of posts or post holes were found in the areas cleared.

Once the area around the forge was weeded and cleared of fallen stones and surface finds, it was obvious that the underlying soil was the usual light brown, layer (2), with some dark brown charcoaly areas very close to the forge itself, layer (3). This layer (3) appeared near the western edge of the forge in 15T, the only square excavated to any depth; in the southern part of 15T, and most of 14T bedrock appeared very close to the surface. 14S and 15S could not be thoroughly checked because of lack of time, but there were no surface indications of different deposits of any depth.

The artifacts were more helpful, and mostly on the surface. One that strengthened our identification of the structure as a forge, was found almost in the middle of the northern or back face of the forge - the tin attachment which held the handle and the bellows together. This is very rough, obviously made on the site, and retains three of the original 4 nails at the narrow end. (More detailed description in the artifacts section, p.134) Other surface finds included two squarish pieces of lead (in 14T and 15T), several lengths of wire rope (14S), several lengths of wire, mostly No.8 guage, a horseshoe, an unidentified tin cylinder, and several nails. Layer (3) in 15T contained a small wedge and a piece of iron. There was also quite a bit of broken glass, part-

icularly along the western side of the forge, in 15S and 15T. Among the common green and brown (wine or beer) fragments were many from a square brown Clements Tonic bottle. Most of this appeared on the surface of 15T, with more fragments in layer (2).

Immediately east of the forge, lay the remains of structure G.

Structure G, possible store room — Square 11,12 and 13S 11, 12 and 13T.

This was the most inconspicuous of the exisitng structures on the D site, and the most easterly. It is only some two metres from the forge, and I am sure the two structures were related in some way. The ground slopes from north to south, with a lesser slope from west to east and the deposit was shallow, with a lot of outcopping bedrock. The surface indications of the structure was a very loose grouping of stones, roughly square in shape with a possible entrance at the SE corner. In all squares the removal of the surface weeds and stones produced areas of patchy light and dark brown soil, and except in 13S and 12T, postholes marking the four corners of the structure. The two squares with the most information were 11S, with some interesting structural detail, and 12S which covered most of the interior of the structure.

Once 12S was weeded and cleaned over, a light brown layer (2) was found to cover most of the square except in the south eastern quadrant which contained a darker, looser

brown deposit, layer (3). This layer ended in a thick concentration of charcoal running towards the eastern edge of the square, some 60cm from the northern baulk. The removal of the loose surface stones and a further clean over removed the thin layer of charcoal, but left a larger area of dark brown. This was still very patchy with some dark brown, some very black and some charcoally deposits. There were some patches of whitish-grey deposit across the northern half of the square. The very black deposit in the south east quadrant, layer (4) was very similar to (3) except in texture and was slightly lighter, (3) now confined to the southern edge. Another soft black deposit along the middle of the eastern edge was designated layer (5), and a similar patch in the NE Corner became layer (6). Although slight changes in colour and texture between these deposits are obvious in plan and section, those in the eastern half were probably closely related, and certainly deposited within a short time. Apart from a small posthole and a hollow in the SE corner, the whole deposit was no more than 10 cms. deep. Layer (5) on the western side proved rather unusual in that it covered a group of well laid out large stones of some 50 cms. by one metre. Underneath these stones was a loose brown soil, layer (7), apparently filling in a natural hollow. Although there is quite a slope in this square, the hollow made the ground surface too uneven for convenience. The hollow and overlying deposits barely extended into the adjoining square 13S. The square contained the north-west post, on its western baulk, and two and a half much smaller postholes (without any post remains) in the south east quadrant. Posthole 4 near the southern edge in the eastern half was much less obvious than the two other small postholes and appeared within a slight hollow beneath a wider deposit of dark earth. A similar situation occurred in the SE corner of the square and it is possible that there could have been



Plate 34: Structure G, 11S, fallen posts. From W.

a small posthole in that area. Otherwise we are left with a post in the adjoining square 11S, which would give a trapezoidal shape to the post outline.

Square 11S produced some very interesting post remains beneath the surface "wall" stones, which had spread over most of the southern and western parts of the square. When the stones were removed, they disclosed two burnt posts and the slightly burnt remains of two post lengths, one lying on a north-south axis, and the other at rightangles, with one of the burnt posts as the NE corner post within the angle formed by the horizontal posts. Immediately north and east of these remains the soil was stained a very dark brown, and the deposit inside them was quite black. The remains of the second vertical post, near the southern edge of the square was unexpected, but may have been needed for extra roof support.

In 11T, apart from removing the loose stone "wall", only the NW corner was excavated. Here the black of 11S continued inside the structure, with some grey ashy patches. A post hole indicating the SE corner of the structure was found in the right place.

The black continued into 12T, but about midway across the square disappeared into a light brown deposit with some dark patches. This lighter brown continued into the SW corner of the structure, in 13T.

Generally, outside the loose stones, the deposit was a light orangey brown - the usual weathered rock deposit. Apart

from the first clean over very little excavation was done on the exterior. During the excavation of this area a kind gentleman with a metal detector ran his machine over some of this deposit to check for finds, so I resisted the temptation to look any further, on principle. More to the point, lack of time made such excavation low on the list of priorities, and the soil deposit was very shallow, with a lot of outcropping bedrock. The main reason for looking at this area was to investigate the structure itself, the wall area and interior, for clues as to useage.

Most squares had very patchy deposits beneath the loose stone "wall", and across the interior, of light and dark brown, loose black and small isolated patches of grey ash. Possibly the last signs of the floor or fallen roof timber, in reasonably good condition, were found in square 11S. A black deposit, occasionally containing charcoal and/or ash was found in all sections and in the appropriate parts of those sections. The southern edge and SW corner of the structure show the least signs of timber remains, and no sign of any "door" posts where the lack of stones could indicate an entrance. It could be that the smaller posts and postholes in 11S and 12S were internal supports for a bough roof.

The artifacts from the structure did not help to identify it. There was very little glass, apart from the Lea & Perrins stopper found in 12T. Pottery was equally scarce, one clay pipe fragment from 12S, and some eartherware from 13T and 13S which matched the jar found mostly around structure B. Some very small bone fragments were found in 12S and 12T, but the majority of the finds were nails, mostly

in very bad condition. Taken in conjunction with the forge fireplace, I am inclined to think that these very eaten nails may have been handmade on the site from No. 8 or other wire, when stocks of machine made nails were low. It is quite usual to find nails in almost mint condition alongside those in very bad condition, so it is possible that the latter were handmade. There are several examples of looped wire, some of which could have been used to hold horizontal and vertical posts together; interestingly enough, none was found in 11, 12 or 13T. Apart from a very rough rectangle of iron, some 10 x 1 cm., from 11S and a small wedge from 12S, and the nails, there are no other clues to the useage of the room. Some tin ends were found inside the structure, but the only sardine tins were found outside, so it is unlikely that it was used for eating or living. A storage or work room seems the most appropriate.

Structure F, the ash pit. Squares 14 & 15V, 14, 15, 16W.

On the surface, this was a low, loosely piled stone semi-circular structure, built up on the southern side because of the natural slope, with an opening on the north west. It was obvious that quite a bit of the original walling had slipped, especially to the south and south west. It was hoped that excavating the structure would help us identify many other similar structures scattered over the settlement area, close to the European camps. This was not to be.

Apart from surface weeding and clearing, the excavation centred on the interior of the structure, within square 15V. Stones covered almost two thirds of the square, though many



Plate 35: Interior of ash pit, showing stones fallen into pit area, and the stones set on edge on the left, indicating the westernmost edge of the pit; below this was the line of burnt wood. From S.

had fallen in from the "wall", which ran around the northern, eastern and southern perimeters of the square. Inside the "wall", the initial clean up showed a slight hollow with a light brown deposit, layer (1), with some small patches of fine grey ash, layer (2). Along the western side of the square appeared an orange chip deposit, layer (3); lack of time prevented the excavation of this obviously fill deposit.

Layer (1) disappeared very rapidly, and the grey ash (2) became the most important and extensive deposit in this square. It soon became obvious that the loose stones that had fallen inside would have to be removed as the deposit was excavated. In this way we were able to establish the original line of the "wall". Around the edge of the grey ash, especially near the wall and fallen stones were found some patches of pale yellow-brown probable mortar deposit, sterile, obviously used in the construction of the wall. Along the western edge of the grey it became necessary to remove two big stones, wedged in at an angle of about 60, between the ashy (2) and the orange-brown soil beyond. Beneath these stones was a line of very fragile fragments of sawn wood, extending from the south-west to the north-east across the interior of the structure. It was found to be just above bedrock, but further excavation proved that the wood lay on the western edge of a rectangular pit dug within the semi-circular structure, and some 50 to 60 cms. deep. It is probable that the pit was dug to hold ash from the forge, and that as the pit was filled, the stone "wall" was built up as protection from the prevailing south-easterly winds. The wood, possibly from a box or tea chest, may have been wedged along the western edge for the same reason, to allow more ash to be deposited. It seems a rather risky use of wood.

Within the grey ash there were some slight changes. In the NE corner a concentration of wood fragments may have been the remains of a post, but it seems unlikely that the pit would have needed a roof, or any such structural support. In the SE corner a slightly browner grey deposit was noticed and planned, but was not very large. The most significant point about this deposit, layer (4) was that within it were found some very burnt fragments that look like paper. Otherwise there were a lot of nails found within the grey, mostly very encrusted and fragmentary, quite a lot of bone fragments, two clay pipe fragments and odds and ends of metal. As it seems unlikely that any cooking was done on the forge, the bones may have been put into the pit with other kitchen refuse, to be burnt there. The dry and often windy conditions at Arltunga make it essential to contain any possible source of fire.

Plate 36: 24Y(b) working on the second layer.

The Rubbish Dump - squares 24W, 23 & 24X, 22-24Y, 22 & 23Z

The dump was contained within a small steep gully south of and behind the main WRD site structure, although a scatter of rubbish was found on the slope immediately south of those buildings. In the dump the material was so concentrated that each two metre square was divided into four, the NW Corner labelled a, the NE corner b, the SW c and the SE d. Not all the dump was looked at, there was simply too much material to pick up, much less sort out and record. At first, all the finds were cleaned and recorded, but as the volunteers became more aware of the categories involved, the cans were simply recorded on site and bagged. These were left in Alice Springs, which has caused some difficulties - in some cases a closer look has brought up details not always recorded on site. The rectangular sardine type cans especially will have to be rechecked on my return to Alice Springs.

The amount of material made it impossible to plan the whole dump, and as a compromise each of the squares was photographed with the planning frame. Any soil mixed up in the surface layer of finds was very soft,and had obviously been disturbed, so it is probable that bottle hunters had been through the whole dump. The only complete bottles were small, probably medicine bottles, and came from the deeper second layer (only some squares were investigated to this extent, and those not very deeply.) However, there were plenty of broken bottle in the dump. and many with brand names on the base or sides.

As a contrast, .some of the scattered rubbish was picked up, between the main dump area and the work area to the east of

the site. The finds north of a line from 16-22 W were picked up, and so labelled, without any attempt to subdivide the area and the finds into two metre square divisions.

WRII - a storage area?

Between the two main excavation sites, WRA and WRD, some thirty metres from both but further east, was a small flat plateau, artificially extended towards the east. Low stone walls had been built up, extending from the natural flat, and filled in. At first I wondered if this might have been some sort of unloading platform, somewhere for the waggons to pull up by and make unloading easier. This theory was squashed when we found that recesses had been left in the stone walls, for postholes. A cleanover of the interior, and some of the surrounding area produced very few finds, and three postholes in an east-west line, just slightly off centre, but aligned with another posthole in the outer wall on the eastern face. A section was put through the interior fill which showed that the small rubble on the surface was reinforced by a strong foundation of large flat sones, similar to those used in the retaining walls.

The finds were few - several different sorts of tobacco tabs, some wire and packing case tin, some nails but more broad headed tacks or clouts, as one of the volunteers told me, several boot nails including some left in the shape of the boot, and very little glass. It seems most likely that this was an extra storage area for the A site store, both for supplies and possibly as stabling for wagons and horses as necessary.

The area was divided in half, along the east-west axis, the A squares being north and the B squares south, and subdivided into four areas of 4 metres each, numbered 1 to 4 from the east. The structure itself is some six by ten metres, though the western edge is not at all obvious.

PART III: THE ARTIFACTS.

Metal

The biggest category in the metal section covers the tin cans, so necessary on the isolated goldfield, where fresh food was scarce. The history of canned foods reaches back into the early 19th century, although attempts to preserve food had been successful long before then. The Frenchman, Nicolas Appert is generally considered to be the "Father of preserved food", though he did not use tin containers. Appert began work on the problem of feeding Napoleon's army in 1780, and by 1791 felt that his preserved food was satisfactory. Tinplate containers seem to have been used first by the English firm of Donkin, Hall and Gamble, looking to the army and navy as their main market. The tinplate at this time was really tinned iron and very heavy; the famous cans taken by Parry to the North Pole in 1824 had instructions on how to open them with a chisel.

The cans at this time were very simple, a cylindrical body with both ends fitted over the body and soldered. As it was difficult to solder the top end on with the food inside, the hole-and-cap top became common. The top had a central opening, the food was put in, and a tin disc was soldered over the hole, with a vent hole left in the middle to allow steam to escape during the cooking process, which was later soldered over. Various methods were tried to improve on this simple manufacturing process, but none was successful until the turn of the century, when the American Charles Ams perfected his double seaming technique, which allowed the whole top to be attached to the can body after the food was put in. The old hole-and-cap cans continued to be made, but by 1920 the modern double seaming had taken over completely. Various improvements had been made in the tin itself, especially after 1879 when steel could be used instead of iron and was lighter and cheaper. Pasteur's experiments improved the quality of the food, as people realised exactly what heating and cooling did.

America was quick to take up the idea of canned foods, and Australia had an early canning industry, begun by Sizar Elliott in 1843. This was a very small operation, begun in Sydney, but he gave up the business some time after moving to Melbourne in 1852. The drought of 1840-43 spurred others into action in attempts to prevent the wholesale slaughter of sheep and cattle in any future drought. Israel Joseph established a business in 1847, the same year that the Dangar brothers opened their works in Newcastle. Neither was very successful, and ran into labour problems with the gold rush excitement of the 1850s. The gold rush may have had a bad effect at first, but it was soon realised how very useful tinned foods were on the fields. This lead to the

development of various food manufacturers and can makers. It is a particular feature of the Australian industry that the cans were made separately, and brought to the food manufacturer. This may have been due to the fact that tin cans had been used from the early days for such things as cheese, tobacco etc., and that there were plenty of tinsmiths already working. By the end of the 19th century cans had taken over as the greatest single users of tinplate.

The American canning industry had begun in 1817, and by the middle of the century was well established. Vegetables and fruit were very popular, and the canning of salmon really took off along the Pacific coast from 1864. In Australia the first successful firms produced jam and fruits; both Tasmania and South Australia have long established jam factories. In 1862 the McEwen's of South Australia established their Glen Ewen factory just outside Adelaide, using cans supplied by the firm of A. Simpson & Son, who set up business in 1853. Also in 1862, in Tasmania, Henry Jones was born, who became famous during the first World War for his jams. He worked in Peacock's jam factory before setting up on his own. Perhaps more important for real survival, various firms were set up interested in the preservation of meat. Early experiments in chilling meat were not successful, but the canners slowly forged ahead. The Melbourne Meat Company was well established by 1867, and several Queensland companies appeared in the last two decades of the century, particularly around Townsville and Brisbane. In 1871 the Central Queensland Meat Preserving Company Pty. Ltd. established a meat works at Townsville; the company had a very chequered career, with the works being closed, changing hands, suffering disastrous fires, and changing names. From 1880 it was known as the Central Queensland Meat Exploration Company, and in 1892 there was another change to Queensland Meat Export and Agency Company with works at Ross River, Townsville and at Brisbane. The only tin from the White Range excavation that can definitely said to be Australian has the manufacturers name on the base, but unfortunately there is a large hole in the base too. However, Queensland is quite clear, and what looks like A.M.E. Ltd., although the A is indistinct; and the town of manufacture could be Rockhampton, but only the pton remains. More research and excavation may solve this problem.

So far I have been less successful in researching the rectangular tins and their methods of construction, which tend to differ from the more usual cylindrical cans.



Fig 1a: MC24 rectangular Norvege cans.

Fig. 1b: MC 76, tin printed base, and similar top.



Rectangular cans

These vary quite considerably in height and construction, but the general shape remains much the same, the most usual base measurements being 10.5 by 7.5 cm. There are the low rectangles, commonly associated with sardines; medium rectangles, and the tall side opened probable meat tins.

The low, flat, sardine types seem to be of the "modern" construction, double seamed on the upper edge, and with the base and sides made from one piece. The main variation within the same dimensions has the top and bottom inside the body of the can. The more usual construction, of outside seaming at the top and bottom occurs in the slightly bigger cans, 3 cm. high, to 3.3 cm., and are of the "modern" type. The only "old" construction examples come from the taller cans, up to 10cm. high, which were opened from the side. Another group has the top of the can inside the body, with the outside seam at the base - also a "modern" type, and come in the low 2 cm. high, and medium 4.4 to 4.6 cm. high types.

"Sardine" cans usually 2.2 cm. high, base 10.5 x 75 cm.

There are small variations in height, particularly among the cans stamped NORVEGE on the base, from 2.2 to 2.5 cm. Some variations could be ascribed to the difficulties of measuring the more squashed examples. The cans are described as sardine because most are base stamped Norvege, and two examples retain some of their tin-printed labels, both of which mention sardines.

1. (MC24) 2.5 cm. high, usual base. Top remains in flat piece (key may have been lost). Base and sides in one, double seamed to top. Base slightly indented, plain except for raised lettering NORVEGE.

This example and 17 others came from the WRD rubbish dump.

One each came from WRD 13S(1), 11T(1) and 23S(1)

2. (MC76) 2.2 cm. high, usual base. Base and sides in one, double seamed to top. Most of top removed, leaving neat oval shape. Base and sides have faint remains of tin printed label: on base LYSEFJORD BRAND SARDINES, with the outline of a fish beneath; both long sides have SMOKED SARDINES.

This example came from the rubbish dump. Others without the label but with a similar oval shape when the top was removed

Fig. 2 MC77, tin printed lid, with similar base.



do occur in the WRG rubbish scatter: 4 examples including MC50, and one with the lid intact, showing how it was opened.

3. (MC77) 2.2 cm. high, base 10.5 x 7.6 cm. base and sides in one, double seamed to top. Although opened, top remains, with tin printed label in bad condition. Some words are clear: THE ... FINEST ... WORLD BRANDS SPECIALLY PREPARED ... NORWEGIAN SARDINES.

4. (MC14 MC19) Similar to MC77 with top rolled back to key.

These two examples, and one other came from the WRD rubbish dump, and two from the WRG rubbish scatter.

One less common category has small variations in dimensions and construction. This type has the narrow body inside the separate top and bottom:

5. (MC57) 2.2 cm. high, base 10.5 x 7.4 cm. In profile, the side is rather pointed at top and bottom and slightly indented in the middle. Base has raised line around the edge, otherwise plain.

6. (MC13) 2.1 cm high, 10.6 x 7.6 cm. base. Similar to above except that base has two indentations around outer edge.

7. (MC78) 2.1 cm. high, base 10.3 x 7.4 cm. Similar to MC 57, base has one raised line around edge, but retained lid has a small raised rectangle 3.8 x 2.7 cm. in middle.

8. (MC79) 2.2 cm. high, 10.5 x 7.5 cm. base. Top is rusty, but seems to be plain, base has one rectangular line around edge plus a small circle in the centre, diam. 3.5 cm.

In all cases there was a small protruding semi-circle in the middle of one short side, 3-4 mm wide, with blobs of solder at top and bottom. This would be the normal position for a key opener, but all four examples show signs of a tin opener, rather than the smooth lines of a key opener.

All examples from the WRD rubbish dump.

Another small group has the top flat on to the body, with an outside double seam at the base, which comes in two main sizes and two types.

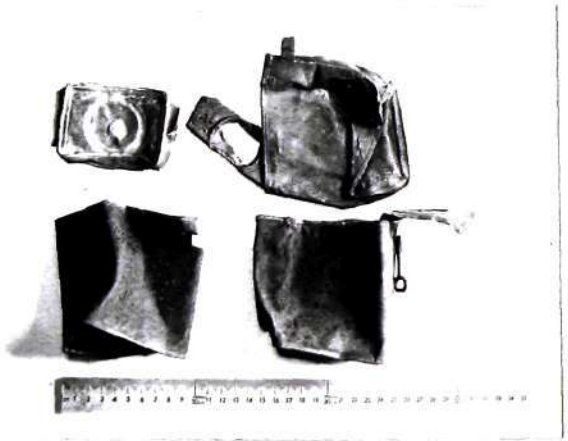


Fig. 3: Taller, side opened cans, MC84 bottom right, MC23 bottom left, MC23 top right.

9. (MC80) 2.1cm high, base 10.8 x 7.9 cm. has very faint indented rectangle with reversed semi-circles at four corners.

10. (MC81) 4.6 cm. high, base 10.8 x 8.0 cm., with similar rectangle on base as MC81.

11. (MC82) 4.4 cm. high, base 10.7 x 8.0 cm., plain with one slight indentation.

A third small group has the separate top and bottom double seamed to the body of the can.

12. (MC51) 3.1 cm. high, base 11.9 x 8.8 cm., with rectangular line near edge; top has been opened but retained and has a small rectangle in centre, as in MC78, No. 7 above. Body has no side seam on short side, but original position of key is obvious.

This example came from WRD 19Q (1) and one other from the rubbish dump. Seven tins of similar dimensions but with heights varying from 3 to 3.3 cm. also came from the dump.

Tall, side opened cans. These show the "old" construction, with a central disc and vent hole on the top. Height is difficult to judge because most have had the tip removed completely.

13. (MC84) Complete tin, even with key. 10.1 cm. high, base 8.2 x 4.9 cm. Rather battered, so measurements may not be quite accurate. Otherwise in good condition, with key in little tab on one short side. Tin opened at top but still attached at one end, and central disc and vent hole quite obvious. Base has one slight inner rectangle. From WRD dump.

14. (MC23) As above, attempt made to open with key, unsuccessful. Top gone completely. Also from WRD dump.

15. (MC53) 10.2 cm. high, base 8.4 x 4.8 cm., again tin opened at top, but has been flattened so measurement difficult. Central disc has gone. From WRG scatter.

16. (MC54) Correctly opened at side, base 8.2 x 5.0 cm., present height 7.5 cm. Flattened. From WRG scatter.

There were some variations in size:

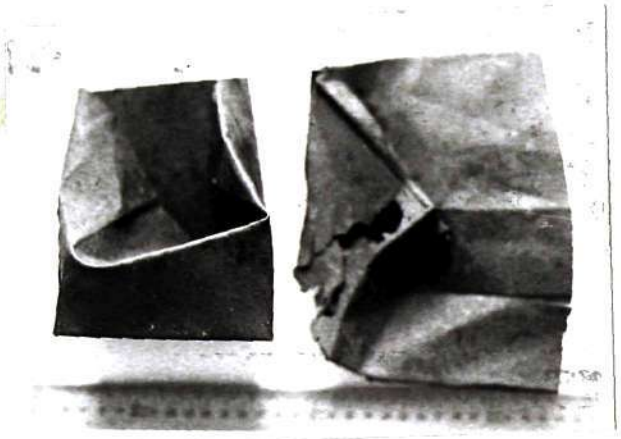


Fig. 4a: MC56, square cans

Fig. 4b: Milk cans, MC6, showing holes punched at one end.



17. (MC55) top only, sides of 1.2 cm., top 8.0 x 5.7 cm., central disc and vent point. From WRD dump, another from WRG.

18. (MC52) separate top and bottom, combined height 6.7cm., base 12.1 x 7.7 cm. Somewhat battered. Base has inner rectangle, top is similar with central disc and soldered vent point. From WRG scatter, plus another.

From WRD dump, two MC84 types (no. 13 above) with top removed, present height now 8 and 9 cm.

Fianlly, a surface find, but probably from another part of the WRG rubbish scatter:

19. (MC85) still with top, 6.2 cm. high, base 12.5 x 9.3 cm., side opened but not completely, top now has very large circle at one end.

Square tins

There were very few of these, only four altogether - they are square based but quite tall, side opened so that none of the top remains, unusual also in that body folds over the base, rather than having a seam at the side.

1. (MC56) Present height 13.6 cm., base 10.2 cm. square - not in good condition.

This example from 17Q (1), plus another from the same layer, one from 16P (1) and 14S (1) - the latter in quite good condition.

Round Cans

These come in all shapes and sizes, from small milk cans, to the large meat and veg. or jam tins. Nearly all are of the "old" type of manufacture, with the noticeable exception of a small group which has retained some most attractive labels.

Milk cans

These are small, 8.3 cm. high, base diameter 7.5 cm., and most have been punched at one end, which indicated that the contents were liquid. The modern condensed milk can is 8.2 x 7.5 cm.

1. (MC6) Base has one indented circle, as does top end. This came from the WRD dump along with 306 others.

One came from the WRG scatter, and one each from 20L(1), 20P(1) and 19Q(1).

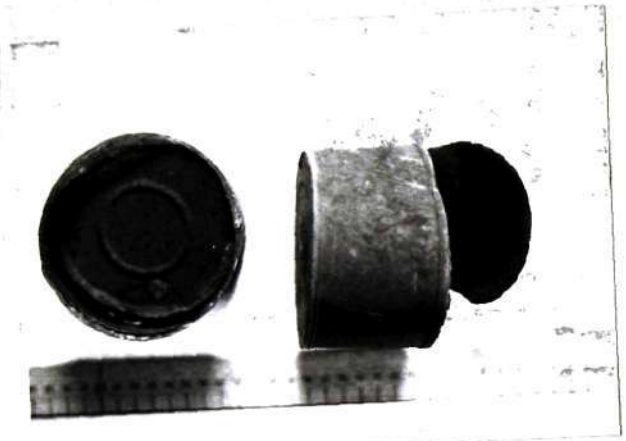


Fig. 5a Salmon or tuna cans, MC12.

5B: Camp pie type, MC9



One slight variation had two circles on the base:

2. (MC7) from the WRD rubbish dump along with 7 other examples.

It is possible that some of the above 306 examples may have the double base ring, but the majority of the cans were left in Alice Springs, and will have to be rechecked later.

A few of the milk cans showed the "modern" double seam.

3. (MC62) 8.2 cm. high, base 7.5 cm. This comes from the WRD rubbish dump, plus 16others.

Salmon or tuna cans?

These are small low cans, wider than the milk cans, all the "old" type.

4. (MC12) 4.5 cm. high, base diameter 8.9 cm., plain, slightly indented. This came from the WRD rubbish dump, with another 22 examples, and two came from the WRG scatter.

The modern cans vary from small, medium and large cans, the small size being 5cm. high by 8.6 cm.

Camp pie ? - low wide cans, side opened.

Most of these have been opened with the key, so are not complete, however one complete example is 6.2 cm. high, and the base diameter 10.6 cm.

5. (MC9) Base diameter 10.6 cm., top removed, present height 3.9 cm.

This example came from the WRD rubbish dump; 17 complete examples came from the dump, along with 94 bottoms and 55 tops; plus 1 bottom from 16M (1b) and 1 from WRG.

6. (MC45) is 6.7 cm. high, base 10.2; from WRG.

7. (MC46) incomplete, base 10.3, but squashed, also from WRG.

8. (MC48) is larger, now 5 cm. high, base 12 cm; no side seam, ends fit inside body - most unusual.

9. (MC67) is 7 cm. high, base 10.8 cm. approx., with end fitting inside the body, as in MC 48 above. This example and another (MC69 which is 6.7 cm. high) from WRD dump.

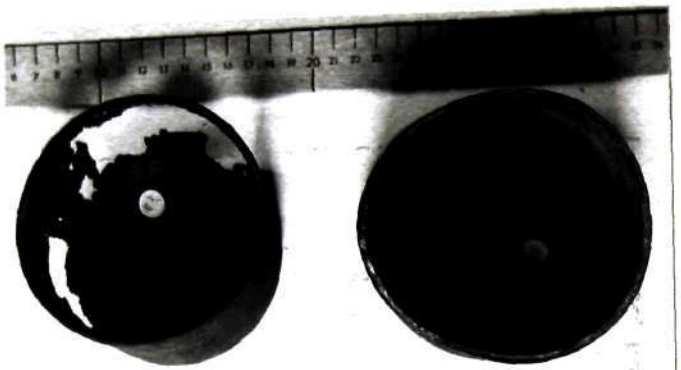


Fig. 6a: MC 64 on right, MC 70 on left.

6b: Tall round cans.



10. (MC64) "new" type, with body and end in one: 5.8 cm. high, base diameter 11 cm. From WRD dump.

11. (MC70) "old" type, but body and base in one; complete height 4.7 cm., diameter 11.2 cm.

Other low wide mouthed cans came from the rubbish dump, with slight variations in measurements:

1 at 3.9 x 11.5 cm.
2 at 4.5 x 12.0 cm.
1 at 4.7 x 10.8 cm.
4 at 5.8 x 11.0 cm.
8 at 6.6 x 10.0 cm.
1 at 6.6 x 11.0 cm.
2 at 7.0 x 10.0 cm.
1 at 7.5 x 9.0 cm.
1 at 4.5 x 11.5 cm.

Tall round cans

As with the low wide cans, there is considerable variation in measurement. Some of this is due to slightly squashed cans, and some to innacurate measuring; some allowance has been made to cover these possibilities.

All have a very obvious circle and solder point in the top end and plain base.

12. (MC4) 11.6 cm. high,base 9 cm. From WRD dump, plus 27 others
13. (MC3) 12 cm high, base 9.1 cm. From WRD dump, plus 1 other
14. (MC16) 11.5 cm. high, base 8.6 cm. From WRD dump, plus 7 others
15. (MC17) 11.6 cm. high, base 7.5 cm. From WRD dump, plus 5 others
16. (MC26) 11.7 cm. high, base 7.5 cm. From WRD dump, plus 5
17. (MC25) 11.8 cm. high, base 9.0 cm. From WRD dump, plus 2
18. (MC10) 11.6 cm. high, base 8.8 cm. from WRD dump.
19. (MC29) 19.1 cm. high, base 7.9 cm. from 17Q (1)
20. (MC32) 12.6 cm. high, base 10.1 cm. from WRG scatter.
21. (MC35) 12.3 cm. high, base 10.4 cm. from Mine 2
22. (MC39) 9.2 cm. high, base 9.0 cm. from WRD 19P(1)

Also from the WRD rubbish dump:

2 at 11.0 cm. high, base 7.5 cm.
1 at 11.0 cm. high, base 7.9 cm.
2 at 11.2 cm. high, base 7.3 cm.
4 at 11.2 cm. high, base 9.0 cm.
2 at 11.3 cm. high, base 7.5 cm.
11 at 11.5 cm. high, base 8.5 cm.
5 at 11.5 cm. high, base 8.7 cm.
12 at 11.5 cm. high, base 8.8 cm.
9 at 11.5 cm. high, base 9.0 cm.
3 at 11.6 cm. high, base 8.4 cm.
3 at 11.6 cm. high, base 8.7 cm.
90 at 11.7 cm. high, base 9.0 cm.

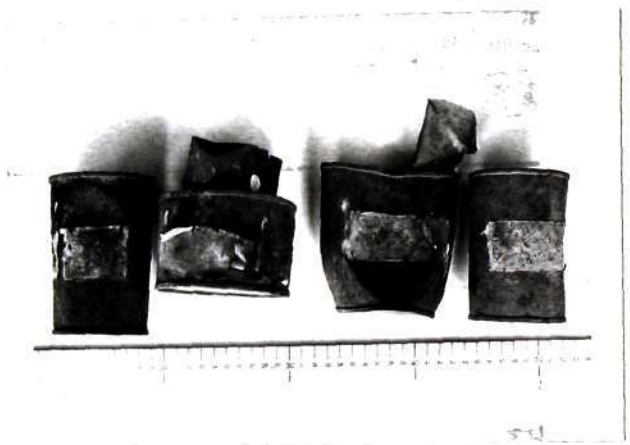


Fig. 7: MC60 on left, MC59, MC61 and MC18 on right.

26 at 11.9 cm. high, base 9.0 cm.
3 at 12.2 cm. high, base 10.2 cm.
1 at 12.4 cm. high, base 4.5 cm.
1 at 12.5 cm. high, base 7.8 cm.
6 at 12.5 cm. high, base 8.0 cm.
1 at 12.7 cm. high, base 8.3 cm.

These cans could have held meat and vegetables, fruit or jam, which may explain some of the slight differences. Modern cans still vary quite a bit.

"Modern" cans, mostly tall and narrow.

These cans are particularly interesting because many of them retain a thin label; tins and labels vary a little, but on the whole the labels are in French, the contents mostly peas, with one lower can containing beans. The peas may have come from Holland, the beans from Italy. Such tins are rather exotic in the rather poor hardworking confines of the White Range. This may be another indication that the O'Neil's who lived at the D site were quite well off. It will be interesting to see if other camps produce these particular tins.

23. (MC60) 11.9 cm. high, base 7.3 cm., interesting for the very plain label, incomplete. CONSERV ALIMENTAIRE
ETIT POIS
OYENS
with an H surrounded by a diamond in the middle between Petit Pois; the background is cross hatched. This came from the WRD dump, the only example, though MC27 has similar measurements, i.e. 12 cm. high, base 7.3 cm., but has not retained the label.

24. (MC28) 11.2 cm. high, base 73.5 cm. This has the best label, with CONSERVE ALIMENTAIRES curved around at the top, PETIT POIS MOYENS across the bottom, with flowers, wavy patterns and traces of gilt. Label is 8 cm. x 3.7 cm.

25. (MC18) 11.2 cm. high, base 7.5 cm., label gone. Base has raised letter X in middle. This and 18 others came from the WRD dump, 4 others with the X, 2 with letter O; any with labels remaining are similar to the MC28 type (n. 24 above).

26. (MC61) 11.5 cm. high, base 7.8 cm. Retains both ends, one opened. Label differs slightly from MC26 type - CONSERVE ALIMENTAIRES still curved at the top, PETIT POIS MOYENS in small panel in centre, in 2 lines, and below that DUTCH PRODUCE. This example came from WRD 23S(1), inside the possible outside kitchen structure D, the only one from the excavated area as opposed to the rubbish dump; one other example came from the WRD dump, and one from the WRG scatter.

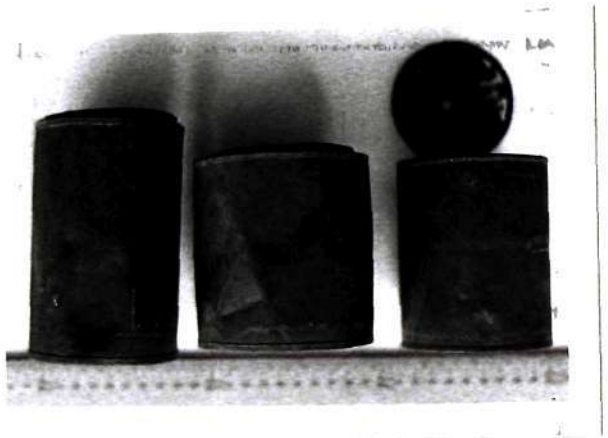


Fig 8: Three slip lid cans showing variations in size.

27. (MC58) 7.8 cm. high, base 9 cm., only slight remains of label. From the WRD dump.

28. (MC59) 7 cm. high, base 10 cm., with a plain label similar to that of MC61, (no. 26 above) but with the words HARICOT VERT MOYENS instead of the Petit Pois, and at the bottom, ITALIAN PRODUCE. This came from the WRD dump, with two others, without labels.

Other slight variations in size occurred:

1 at 11.2 cm. high, base 6.9 cm.
1 at 12.0 cm. high, base 7.3 cm.

and from the WRG rubbish scatter:

1 at 11.4 cm. high, base 7.6 cm.
1 at 11.6 cm. high, base 7.3 cm.

Slip lid cans, round

These varied considerably in shape, size and construction. The smallest was only 5.1 cm. high, the tallest 12.7 cm., they came in "old", "modern" and ends inside bodies types, and some retained some of their original contents, still being tested, that may have been coffee in one, and golden syrup in another. These sorts of stores would be expected in such cans.

1. (MC15) "Old" construction, 12.7cm high, 8.3 cm. base diam. Retains lid, diam. 7.5 cm. This came from the WRD dump, with another example which may contain coffee.

2. (MC1) "Old type, 11.5 cm. high, base 9 cm., lid diam. 7.9 cm. From WRD dump, with 4 others.

3. (MC74) "Old" type, 10 cm. high, base 8.3, lid diam. 7.4. Retains some of contents, possible golden syrup. From WRD dump, with 3 others.

4. (MC73) "Old" type, 9.9 cm. high, base 9.5 cm., lid diam. 8.1 cm. From WRD dump with 8 other examples.

5. (MC22) "Modern", 13.4 cm. high, base 8.5 cm., lid gone and opening 6.3 cm. Base obviously indented. From WRD dump with 3 others; plus 3 cans, old type, same measurements.

6. (MC72) "Modern" type, 8.5 cm. high, base 7.8 cm., lid gone and opening only 5 cm. diam. From WRD dump.



Fig 9: Lids - Muckarts Preserved Potatoes, Robur Tea
Bidwell's Axle Grease.

7. (MC44) Constructed with ends inside body; 7.3 cm. high, base 8.5 cm. Lid gone, opening 6.6 cm. diam. From WRD 16L(1).

8. (MC71) The smallest, "old" type, 5.1 cm high and broad, with lid diameter 4.6 cm. May have contained baking powder?

Other variations in size, all of the old type, from WRD dump:

6 at 12.6 cm. high, base 8.2
4 at 11.0 cm. high, base 9.0
2 at 10.0 cm. high, base 9.4

2 at 6.0 cm. high, base 9.4
1 at 5.8 cm. high, base 10.9
1 at 5.7 cm. high, base 10.0

An important addition to the slip lid category remains only as the slip lid, occasionally with the top of an obviously large square tin:

9. (MC91) Round slip lid, with around the edge MUCKARTS PRESERVED POTATOES and across the middle PATENT. Most of the inner part of the lid is a red colour: at either side are the remains of two small rectangular clamps, to keep the lid on. From WRD 20N(2) - others from 19P(1) and one from the WRD dump.

Other slip lids, complete with part of tin top were found:
From WRD dump - 1 top 16.3 cm. square
1 top approx. 20 cm. square, lid gone
1 top cut to 22 x 25.5 cm., lid gone
2 complete tops, 26.5 x 22.5 cm. "old" type, with lid, one corner cut out, and 2 holes near central slip opening, one with a harness rivet through it.
1 exactly the same, from WRD 16N(4)

Miscellaneous tins, with some lettering.

1. (MC20) "Old" type, round now 8.4 cm. high, base 7.2 cm., bad condition, part base gone, but what remains shows lettering: QUEENSLAND curved around one side, and A?M E CO. LTD around the other, with PTON across the middle.

Although there was a meatworks in Rockhampton, Queensland from very early in the meat canning industry of Australia, the company's initials do not seem to be correct.

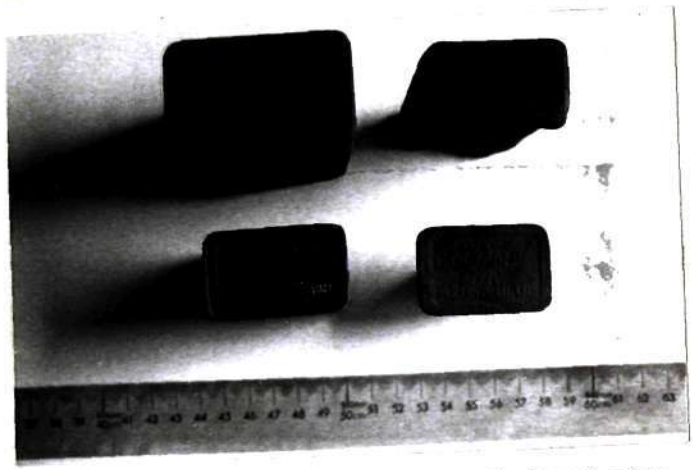


Fig 10: Robinson's Groats and Colman's Starch tins.

2. (MC86) Tall, rectangualr, cut off sides, base inside body, now 11.6 cm. high, base 8.1 x 5.1 cm. with ROBINSON'S PATENT GROATS on indented base panel. From WRD dump.

3. (MC87) Small rectangular, cut sides, now 9.8 cm. high, base 6.2 x 4 cms., inside body as with MC86, with lettering COLMAN'S NO. 1 STARCH. From WRD dump, 2 other examples.

4. (MC88) Similar to MC87, now 9.3 cm. high, base 6.3 x 3.9 cm., and "old" construction, base outside body, and plain. From WRD dump.

5. (MC89) Lid, 6.4 cm. x 4.3 cm., recessed panel with USE COLMAN'S NO. 1 AZURE BLUE. May have fitted onto MC88? From rubbish dump.

I was quite convinced that a woman was associated with the D site when the starch tins, although I may be maligning the miners' standards; again, only further excavation will show if such items were standard.

Other stamped lids were rather more appropriate for a mining community:

6. (MC94) Oval lid, 12.3 cm. long, 8.3 cm. broad, not in good condition, with Robur NUMBER 1 GRADE TEA. From WRD 16N(1), with 3 others from WRD dump, 2 in better condition.

7. (MC95) Round lid, diam. approx. 10.5 cm. but very battered, BIDWELL'S AXLE GREASE. From Min 2.

8. (MC96) Square top from oil can, 13 cm. square with round opening in one corner unused. Top has been removed, probably so that the rest of the can can be re-used (and not for dancing in). Small handle remains near the middle, close to the pouring hole. AMERICAN OIL SONS & FLEMING ? IMPERIAL GALL'S WORKS WHITE ROSE 150° TEST OIL.

9. (MC102) Rectangular match box, 1.9 cm. high, base 7.2 x 3.9 cm. Lid is hinged, with central oval containing trade mark BELL & BLACK curved at top, TRADEMARK across the middle, with a bell, and LONDON curved at bottom; a bigNo. 4 on either side of central disc. Inside, along the back is a small rectangular tab which slots into the shorter sides, to prevent the matches moving too much, and accidentally lighting.



Fig. 11a: Matchboxes.

11b: Probable tobacco tins.



From WRD dump, in good condition; 7 others from dump; 1 from 21M(1) lid only, fragments from WRA 10B(1) and 3 from WRG.

10. (MC106) Matchbox, similar to MC102, but probably earlier - trade mark says R. BELL & CO. curved at top, LONDON across the middle, and ESTABD. 1832 curved at the bottom. Still No. 4 grade. 2.4 cm. high, base 6.6 x 3.7 cm. In the middle of the front long side is a small nob, corresponding to a slight hollow in the lid. The hinged back is separated into five sections as against 1 central hinge in MC102, and there is no sign of an inner tab.

This was a surface find, picked up by some "collectors" who did not want it. It would have been very useful to know the precise location, as I had not seen this type of matchbox on the excavated sites.

While on the subject of matches, quite a few small round tobacco tins were found - some were still nailed to the rough boundary markers. They were useful for protecting the enclosed licences; the bottom was nailed onto the post, and the top screwed on to keep it weatherproof. Some of the more recent 1960s prospecting rights were found on boundary markers up on the Range.

11. (MC103) Round lid with sides, 8cm diameter, 1.1 cm sides, made in one piece. From WRD 17Q(4); another from 17Q(5), 18Q(2), two from Mine 2, and 1 from WRG.

12. (MC104) Round lid, 7.8cm. diam., sides 1.5 cm., in one piece. The bottom side edge has regular vertical markings - for better grip? From WRD 20Q(1), another from 23S(1), one each from WRA 6C(Ph2) and 11B(2).

13. (MC105) Round lid, 7.2 cm. diam., sides 1.2 cm. and stepped out halfway down, to help it screw onto base. From WRD 21M(1).

Tools

Shovels

1. (M65)WRD 23S(1) Metal part of shovel handle, blade gone, but the three rivets remain, that held the wooden handle.

2. (M54) Mine area. Blade and metal part of handle, in good condition except that handle part has been twisted away from the blade - which probably explains why blade shows little sign of wear. Blade is 23.5 x 24.5 cm. Handle retains the three rivets, and near topmost one number 2 and ANDOW STEEL.

3. (M55) Mine area. Well used shovel - blade is 24cm. broad but only 17.1 cm. long in the middle, which is curved in. Part of the back of the handle has gone. As with M54, high on the handle have the number 2, but lettering more difficult to decipher STEE? Handle part 23 cm. long, ends in definite point.

It is surprising that something as large and useful as a shovel would be left around, unless it was no longer useful. The first shovel remnant was found in the outside kitchen area structure D; a shovel would have been necessary for taking coals from the cooking fire to the ash pit, and probably an old shovel, no longer so useful in the mine area, would have been consigned to such domestic duties, which may explain why only the handle part remains.

Pick head

4. (M53) Mine area. Quite good condition, pointed at one end, flat the other, 31cm. broad. Stamped
?ADES C$\frac{O}{37}$ 3½LBS

Again, it is unlikely that such a necessary part of a miner's equipment as a pick would be found in a domestic situation.

Buckets

Two examples have been seen, associated with mines. The best example came from Mine Complex 3, a tall comparatively narrow ore bucket. Unfortunately, when photographed at the site, the measurements were not noted, and that film seems to have been lost. Another bucket, from Mine 2 was more the ordinary type:

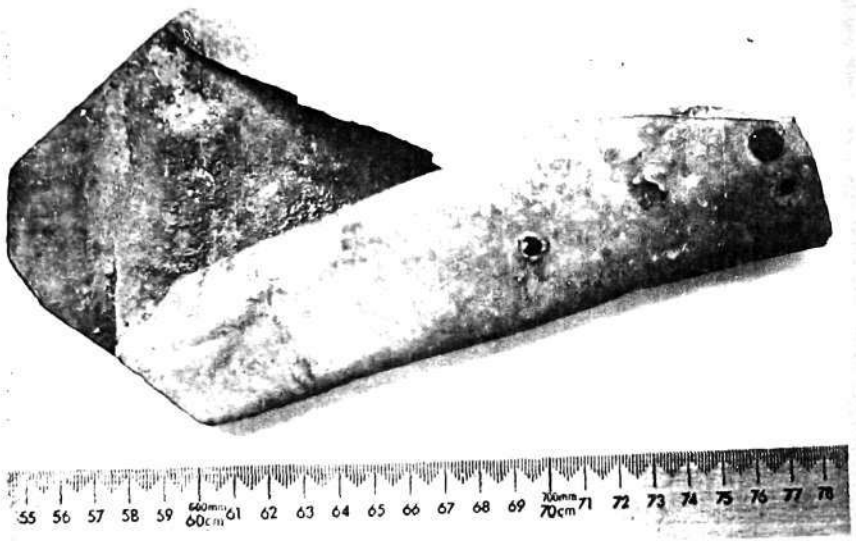


Fig. 12: The tin part of a bellows? M85 opposite.

5. (M56) Rather battered, height 29.5 cm., diameter at mouth approx. 31 cm., but slightly out of shape; base 24cm. The base has an extra metal attachment, like a collar, all round, 4 cm. wide, which at one side has a twist of wire, added as an extra handle to make it easier to empty the bucket. The real handle has gone, plus one of the side attachments, and the top of the bucket is very rusty - it had a rim rolled over wire for strength.

Smaller tools

1. (M78)WRD 20N(3) Cold chisel, 15.5 cm. long, with flattened, well used head, and pointed end; and a heavy iron wedge, used for splitting rock, 15.4 cm. long, head diam. approx. 3.5 cm., round shaft ending in 2cm. broad wedge. Both found very close together.

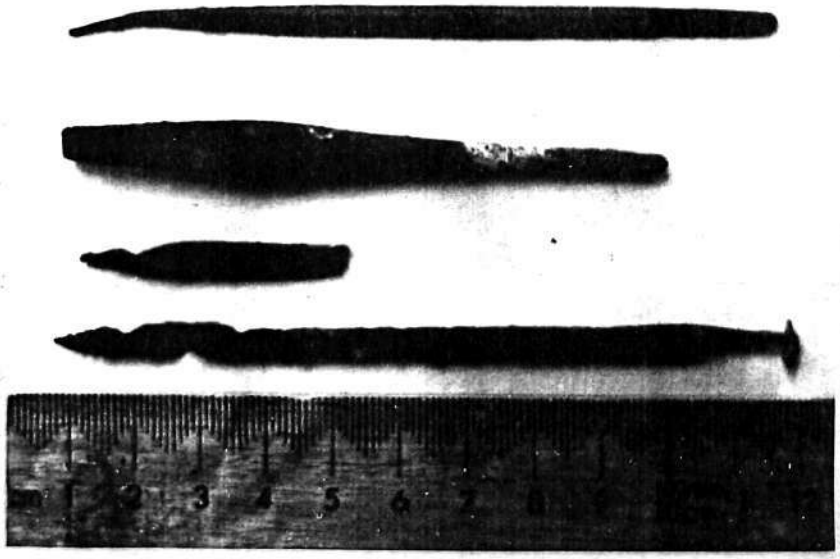
2. (M52) Mine 2 Iron wedge, also for splitting rock, rounded head with squared upper shaft becoming rounded then flattening out into wedged bottom. 8.3 cm. long, head diam. 2.3 cm.

3. (M85) WRD 14S(1) Tin part of bellows? roughly triangular in shape, folder over at one end (approx. 3.8 cm diam.) where it is held by 1 tack. Two other tacks and another hole show that this piece was attached to another, presumably the nozzle part of the bellows. There are two other roughly punched out holes at this narrow end. Flares out to being 12.5cm wide, with very little overlap, then the single back piece ends as a slightly curved triangle, which would support the bag part. The whole thing is very rough, probably made on site.

4. (M59) WRD 19P(6) Metal remains of a paintbrush, very fragile, 8.1 cm across, 5.2cm wide, with the two sides 1.2 to 1.8 cm apart. At the handle side, part of a nail or rivet remained, going from one side to the other. At the bristle end there were two rows of nails or rivets, one row of 10, the other of 11. Most of these have been broken, but seven remain from one side to the other.

5. (M33) WRA 1A(4) Awl? rusty, with small round bronze piece attached to the squared end. 11.5cm long, diameter .4cm.

Fig. 13: Small tools, M33 and M34 plus triangular file and bit?



6. (M34) WRD 17Q(5) Part of an awl?, now only 4.2 cm long.

7. WRH 10J(1) Three sided file? pointed at one end, 11 cm long.

8. WRD 24Xd(2) Bit?, squared at one end and .4cm thick, flaring to shoulder, .8cm thick, then becoming rounded and sloping to .4cm thick again, though end may be broken.

Although not exactly a tool, some lead was found, mostly on the D site and much of that around the forge fireplace. The latter pieces were flattish, had been cut on two or three sides but with very irregular fourth sides, and had small circles punched out of them, along with the indentations of more small circles, not removed.

9. WRA 4C(2) Length of lead, roughly circular, with the ends crossed over.

10. WRD 16N(1) 1 piece of lead.

11. " 18Q(2) 1 lumpy piece of lead.

12. " 19Q(2) 2 small pieces

13. " 24S(2) 1 small piece

14. " 14T(1) 1 medium piece, flattish, signs of circles

15. " 15T(1) " " " "

16. " 15T(2) " " " "

17. WRH " " " "

Also difficult to fit into any category were the three lengths of corrugated iron found:

1. WRD 20R(1) 89.4cm long, 10.4cm broad, with 4 corrugations. Ten holes down one side, plus one at the end, 7 holes near the other side, but along the corrugation. Found within chimney fall.

2. WRD 20RPh2 42cm long, 8 cm wide, with three corrugations, two holes on one side, one still with a tack approx. 2cm long on other side. This piece was found down the eastern edge of the posthole.

3. WRD 20R(3) 91.5cm long, varying from 8cm to 22.5cm broad, with one side very much cut about. At the broadest point there are 8 corrugations, with 1 tack approx. 1.8cm long; three other holes along the long side. This piece was set into the edge of the post trench deposit, between postholes 1 and 2.



Fig. 14a: M37 at top, M39 bottom, M38 on right.

14b: M14, possible drain cover?



Two large iron finds might be part of a waggon axle; they came from the wind tunnel entrance in 2G.

13. (M35)WRA 2G(2) with flat end, sides sloping awaybut broken, one shorter than the other. Both sides divided by a rounded hollow down the middle. Now 6.7cm long, 4.2 across flat end, 4.5cm at other end. All four sides flattened off at the corners.

14. (M36)WRA 2G(2) Solid cylinder, flat on one side, 14.4cm long, tapering from 2.7cm to 2cm diameter. It fits the hollow in M35 now, but might not if M35 was complete.

Other rusty iron objects, and some not so rusty, may also be part of waggon or harness, but has not yet been positively identified:

15. (M37)WRD 16Q(1) Curved piece of cast iron, very smooth, possibly to hold reins on a cart; 13.3 cm long, 2.2 to .9cm broad, 1.3 to 1.9cm thick.

16. (M79) WRD 20N(3) Large rectangular piece of iron, 17.5cm long, 3.4 cm broad and 1.1 to .9cm thick. Certainly broken at one end, but the other has been sloped slightly. Possibly used as a strengthener on a waggon or cart.

Less definite, but still very rough, possibly forged on site:

17. (M82) WRD 21N(3) Rough triangular shape, curved and slightly waisted in the middle; one large hole at the top, two smaller holes at the base, one still retaining a bolt. 6.9cm high, base 7.3cm, .5cm thick.

Also unidentified, but probably more domestic in use:

1. (M38) WRD 19P(5) Round, hollow, with square nut on top and twist of wire. The round part narrows from 4.4cm across to 2.4cm across, and the lower part has 7 grooves in it.

2. (M39) WRD 17Q(3) Six fragments, very rusty, thick round handle, or cog - one longer piece seems to join the middle of the round part. (This may be part of the mincer, the bit of which was found in 17R(5)

3. (M14) WRD 18P(2) Possible drain cover? - quite like a buckle in shape, 5.6 by 4.4cm, with two cross pieces, a twist of wire at one end and a small hollow attachment at the other.

Domestic equipment

1. (M40)WRA 3C(1) 3 pieces, probably from the same cooking pot, one is a base fragment with most of the side and showing the top edge, approx. 18cm high. Body is well curved, with shoulder half way down; edge is rounded. On the base, incised, FIRST QUAL No. 10.

2. (M41)WRA 3C(1) Two joining fragments of cooking pot, 13.9 cm high. Sides are much flatter than M40 and high up CLARK & Co. 6PINTS is stamped within a circle; on the base & C CLARK & C NGLAND.

3. (M42)WRA 4E(1) Cooking pot handle, now pushed out of shape.

These could well have been supplies kept in stock, although the broken cooking pot pieces may have been returned by a dissatisfied customer.

4. (M84)WRD 17R(5) Part of a mincer? heavy round piece, with spiral, with a narrow attachment piece.

Found inside Structure B, probable kitchen.

There was very little evidence for the actual cooking and eating of food, which is not surprising as most utensils were of iron or tin and unlikely to break. The only utensils found were a small spoon from the A site, and a small fork from the D site.

5. (M62)WRA 5B(3) Spoon, now 10.8cm long, but the handle is broken, and a chip has been taken out of the end of the bowl, which is 5cm long and 3cm broad. On the back of the handle, SILVERITE W P & Co is stamped.

6. (M77)WRD 23R(2) Small iron? fork, with 3 tines now broken; now 14cm long, 1.7cm broad at shoulder. Handle is recessed with two wooden panels still in place. The fork was found wedged down against the outside and north wall of Structure D.

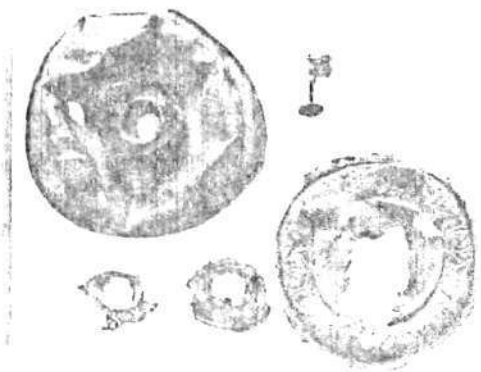


Fig. 15: The metal lamp fragments.

Lamp fragments

The metal parts of a lamp or lamps were found associated with structure B, except for one piece from 20Q (1).

1. (M1) WRD 17Q(1) Plain lamp base, now pushed out of shape, but originally circular, with two small ridges around the base. In the centre there is a hole, with a circle of raised tin around it; another higher circle surrounds that, and this outer circle has two semi-circular holes at the base plus a small U shaped hole at one side on the upper edge of the tin. This probably held the regulator. On the main metal base was another circular hole at one side.

2. (M2)WRD 20Q(1) Part of lamp base, in bad condition, originally circular, with a raised pattern around the outer side of the piece. This could have been attached to the bottom of M1.

3. (M3) WRD 18Q(1) Small circle of tin, with raised edge, cut out pattern, less than half now remaining. This would have protected the lamp wick.

4. (M5) WRD 19Q(3) Similar piece to M3, wick protector. This has been flattened, but is larger than M3, with a larger and simpler cut out pattern - possibly from a bigger lamp.

5. (M4) WRD 19Q(1) Lamp regulator handle, with two inter-locking wheels at one end. Handle is 3cm. long, and end is 1.55cm. in diameter, with a pattern, possibly trade mark.

6. (M63)WRD 17R(5) Plain metal part of lamp which held the wick, complete with handle, with the letters J E ? on it. The surround is plain, with elongated circles.

7. (M64)WRD 17R(5) Part of a lamp, similar to M63, probably a funnel part. Just over 3 cm. high, widest diameter 5 cm.

Peter Cuffley's Complete Catalogue and History of Oil and Kerosene Lamps shows that the raised pattern on M2 was very popular at the beginning of this century for bracket, table or hanging lamps. The open patterned wick protectors or glass holders, M3 and M5, remained fairly standard.

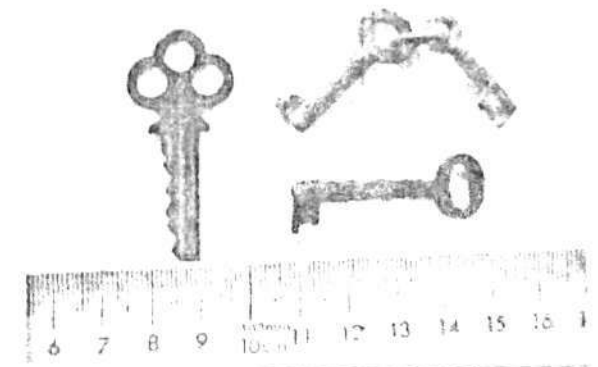


Fig.16: Yale and barrel keys.

Door fittings, locks and keys

Keys

1. (M6) WRA 4C(5) Yale key in good condition. 5cm. long. Trefoil end is stamped Yale, Stamford Conneticut Oct 8 1878 Patented Nov 8 1880. According to H. R. Towne, in Locks and Hardware (1904). Yale began in October 1868 at Stamford, with Henry Towne, who took over when Yale died in December. The original flat key of Yale was replaced by the improved corrugated key with trefoil end in 1882, and this was replaced by the "Paracentrix" key with rounded end in 1892. This would date the key to between 1882 and 1892. It is quite possible that stocks of keys could take some time to disperse from America to Australia and thence to Arltunga. Its presence does indicate an early date for the store at the White Range, and may indicate that Joseph Harding, on the field from 1890, may have opened the store, as the most likely person to have a stock of such keys. Most miners would not be in a position of needing such a key, so any stocks would last for some time.

2. (M9) WRD17Q(1) Small bacrel key, to lock small chest or trunk, 4.1 cm. long.

3. (M13)WRD17N(1) Two small keys, bound together with a ring of wire, similar to M9, 2.8 and 3.2 cm. long respectively.

Such keys may have been used to lock up food stores or personal valuables.

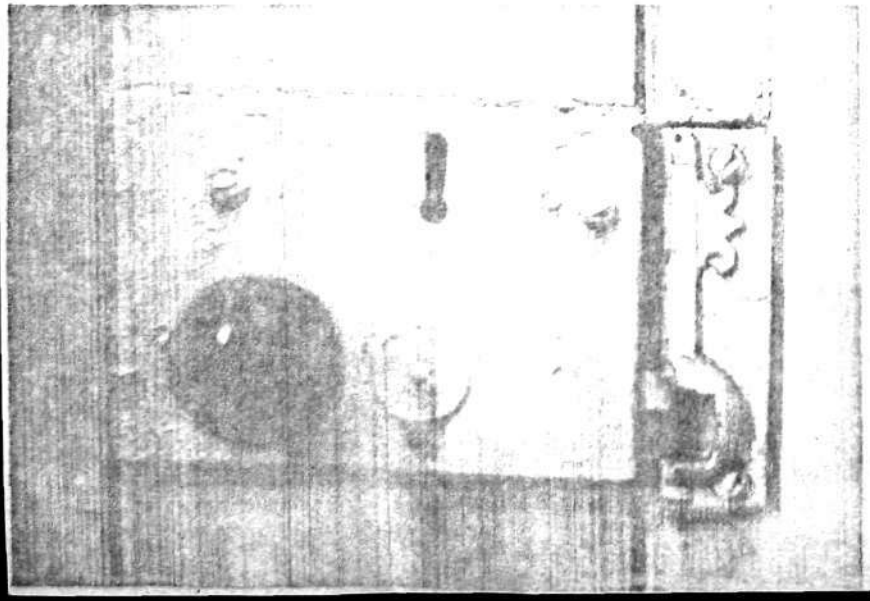
Locks - Padlocks

4. (M10)WRD 17Q(4) Small padlock complete with plates for attachment to door and wall; padlock has been locked, which has kept the two sections together. Wall attachment is rectangular, 3.5 x 4.8 cm, with 3 holes; lock piece 7.2 cm. long. Door attachment is irreg. hexagon with 2 holes. Padlock has slightly curved sides, varies from 2.6 to 3.1 cm. broad, 2.8 cm. high, 1 cm. thick. Around the lock is the manufacturers name, difficult to see: LEVER TIGER .... According to Lassetter's 1909 Catalogue, this lock was made by the Miller Lock Co. of Philadelphia, Pa.



Fig. 17a: Lock plates and fittings, and padlocks.

17b: Showing correct position of M81 fitting.



5. (M11)WRD 17Q(4) Large padlock, rounded shape - rather like a face with two rounded ears, with lock in the middle bottom. The curved locking piece has been rusted into the padlock. Altogether 7.1 cm. long, body 4.8 to 5.5 cm; 5.1 at widest point, and 1.6 cm. from front to back face. Lock is 1.65 to 2.1 cm. long. None of the barrel keys fit the lock, it is too big.

Lock Plates

6. (M7) WRA 3P(3) Basic rectangular shape with partly rounded base to take key hole; two small circles and thin rectangles cut out on either side of key hole; rectangle cut out in left hand upper corner with another small rectangle cut out off centre towards right hand side. 5.5 cm. wide, 4.8 to 3.75 cm. long, approx. 1mm thick. Keyhole 1.6 cm. long

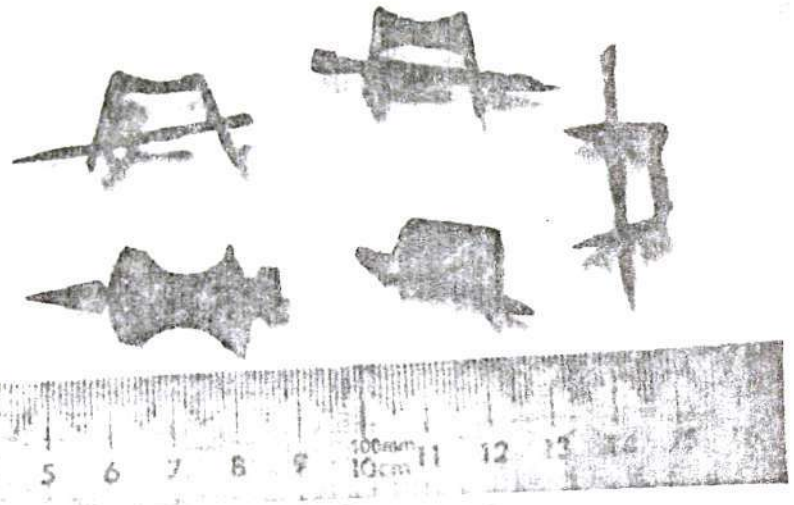
7. (M12)WRD 18M(1) Rectangular lock plate with flared ends, small holes in centre and plain key hole down the centre. 6.2 cm. long, 2.7 to 3.5 cm. wide, 2mm thick. Keyhole 2.8 cm. long.

8. (M70)WRD 24S(L) Possibly from a small box or chest - this is not really a lock plate, but the metal piece with small keyhole. The long rectangle has been broken into two pieces, was approx. 14.4 cm. long, 2.1 cm. at broadest point. On the longer piece there are three rivets or studs which have retained remnants of other metal attachments. Not in good condition.

Lock fittings

9. (M81)WRD 21N(3) That part of the lock and/or door handle fitting that is set into the wall, which corresponds to the door fitting or lock. Two pieces of iron, at right angles, with one piece having an extra fancy addition containing the words Carpenter Manufacture.

I identified this find after visiting my aunt, when I noticed a similar fitting in her bathroom. The WRD Piece has lost the curved part from the lower side of the front piece, but the additional manufacturers trademark showed clearly on the in site example. I have found the manufacturer, Carpenter



Illus. 17c: The mysterious metal "fasteners"

mentioned but have not yet discovered if the firm was English or American.

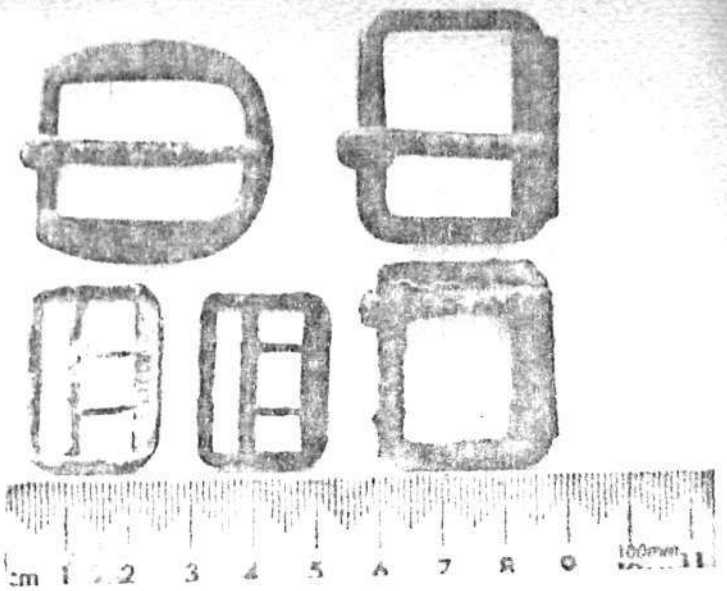
Hinges

10. (M8) WRD 20Q(1) Part of a door? hinge?, broken so that only part of one side remains, and one of possibly two hinged section. The flat rectangular part has one hole, 6mm in diameter. The flat is 5.6 cm. long, 2.6 cm. broad, while the hinge is 3.2 cm. long.

11. (M60)WRA 2D(2) Double hinge of brass or bronze, good condition, each side having three holes set in a straight line, and the hinge in 6 sections. The flat sides are 3.9 x 2.3 cm., the holes 3 mm. in diameter, and each hinge 6.5 mm. long.

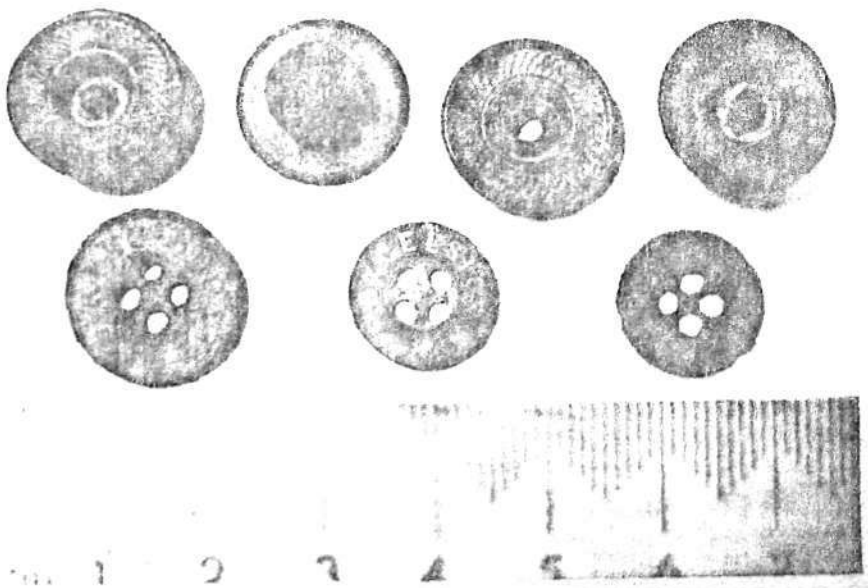
Probably not related in any way to the above items are the small metal "fasteners" for want of a better word, in two pieces, found at the eastern end of Structure C - for some reason they bring to mind upholstery, and visions of comfortable armchairs, and the many people asked for suggestions for their use have not come up with any ideas. The illustration opposite is clearer than any description.

They were found in 16N(3), 17N(1), 17N(2) two and a half, 17N(3) also produced two, 18N(2) and 17P(5)



Illus. 18a: the five buckles.

b: The all metal buttons.



Personal items

These mostly relate to clothing - buckles, buttons and shoe or boot protectors.

Buckles:

1. (M15) WRA 5C(2) Plain, badly rusted so that the tongue has corroded onto the bottom edge. 2.9 by 3.3cm.

2. (M16) WRA 10B(2) Plain, but in good condition, although the tongue has rusted slightly. Small groove in outer buckle edge, where tongue fits, and the tongue itself is slightly curved. 4.2 by 3.8cm.

3. (M75) WRD 23S(3) Smallish pale grey buckle, in very good condition, and rather elaborate, with double tongue, and the letters PARIS in raised lettering along one outer edge - this part is quite thin and flat, and decorated with fine cross hatching. 3.1x 2.2cm.

4. WRD 17N(3) Similar to M75 above, but very rusted.

5. WRD 21R(1) Similar to M15 above, but larger and in good condition, 3.9 by 3.4cm.

Buttons were more common, and quite varied, coming in all metal, metal base for cloth covered, and bone or plastic types.

The metal buttons all had a sunken centre with their own shank, but some were quite plain apart from cross hatching on flat obverse:

1.	(BU5)	WRA 5/6C(2)	diam.	1.65cm
2.	(BU12)	WRD 19M(1)		1.7
3.	(BU13)	" 16L(2)		

Others had some lettering around the edge, no shank:

4.	(BU6)	WRA 10B(2)	BEST RING EDGE,	4 holes	1.7
5.	(BU7)	" 5A(1)	SUSPENDER	4 "	1.4
6.	(BU18)	WRD 23S(3)	EXCELSIOR	4 "	1.4

There were several metal bases for cloth covered buttons, some still retaining some of the cloth:

7.	(BU1)	WRA 2A(3)	some cloth		1.7
8.	(BU4)	" 2B(2)		2	1.4
9.	(BU9)	" 2C(1)		2 "	1.4
10.	(BU14)	WRD 19Q(1)		2 "	1.6
11.	(BU15)	" 21Q(4)		2 "	1.2
12.	(BU16)	" 24R(1)		2 "	1.1
13.	(BU17)	" 24R(1)		2 "	1.1

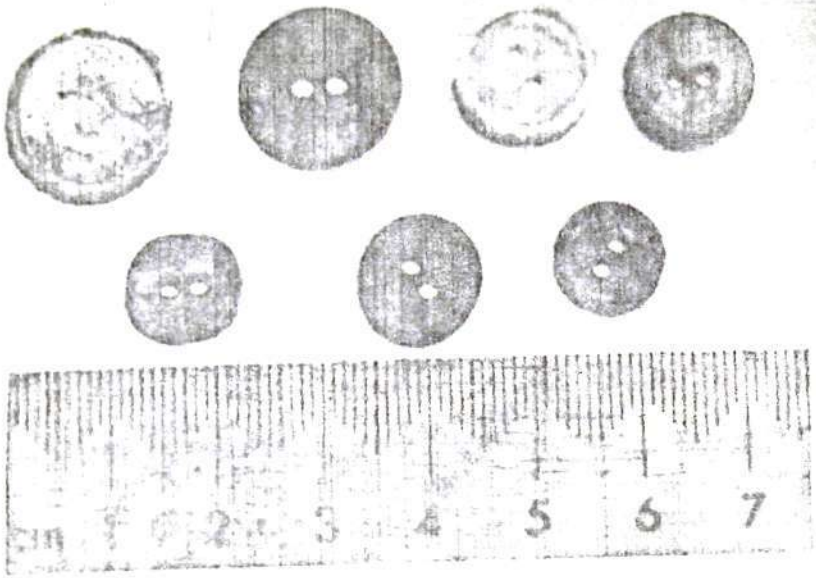
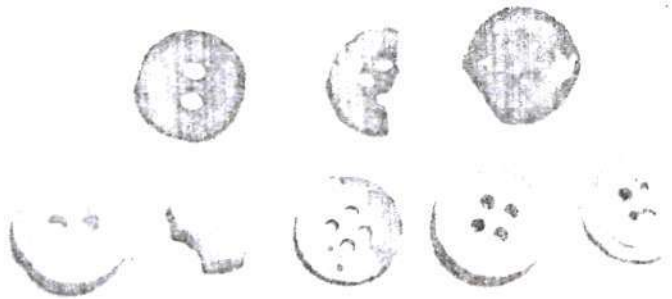


Fig. 19a: The metal bases for covered buttons

19b: The bone and pearl buttons.





There was one brass button, with rounded head and shank, very rusty:

14.	(BU11)	WRD	18Q(1)		1.5

The rest were bone or plastic:

15.	(BU2)	WRA	3C(3)	most, poss. pearl 4 holes	1.15
16.	(BU3)	"	2B(2)	fragment, similar BU8 below	
17.	(BU8)	"	5B(1)	plastic? 2 holes	1.2
18.	(BU19)	WRD	23S(3)	burnt 2 "	1.1
19.	(BU20)	"	23S(3)	most, burnt 4 "	1.1
20.	(BU21)	"	23S(3)	most, burnt 4 "	1.1

A very few studs, with rounded heads and shanks were found:

21.	(BU10)	WRD	16Q(1)	four	1.7cm long .85
22.	(BU22)	"	24R(2)	one, similar	1.5cm long .75

Boot protectors

These were small semi-circles, some solid, and some like small horseshoes, to protect the toe and/or heel of boot or shoe: First, the "horseshoe" type:

1.	(M22)	WRA 6C(2)	Half, approx. 6.4cm long, possibly 8cm wide, with two complete nail holes and a broken one in the middle, holes .4x.25cm.
2.		WRD 24Xc(2)	Almost complete, 5.9cm long, 7.7cm broad; holes very spaced out, 5 altogether, .5x.2cm. rounded ends.
3.		WRD 24Xd(2)	Half, approx. 6.6cm long, broken at middle; holes .4x.25cm, ends rounded.

The solid semi-circles:

4.	(M31)	WRD 16Q(1)	Complete, with 5 holes in 2 rows, base 6.1cm long, rise of 2.8cm, hole diams. approx .35cm.
5.	(M32)	WRD 19P(6)	Similar, but in bad condition; base 3.1cm, rise of 3.1, holes almost rusted away. This is slightly more curved than M31, one corner has been bent.
6.		WRD 24Xd(2)	Similar, good condition, base 6.9cm, rise 3.15cm, 5 holes diams approx. .3cm.
7.		WRD 24Xc(2)	Smaller, slightly rusty and with small nick in shoulder. Base 5cm, rise 2.25cm, 3 holes diam. .3cm, two retaining the screws.
8.		WRD 23S(3)	Less than half, very rusty.

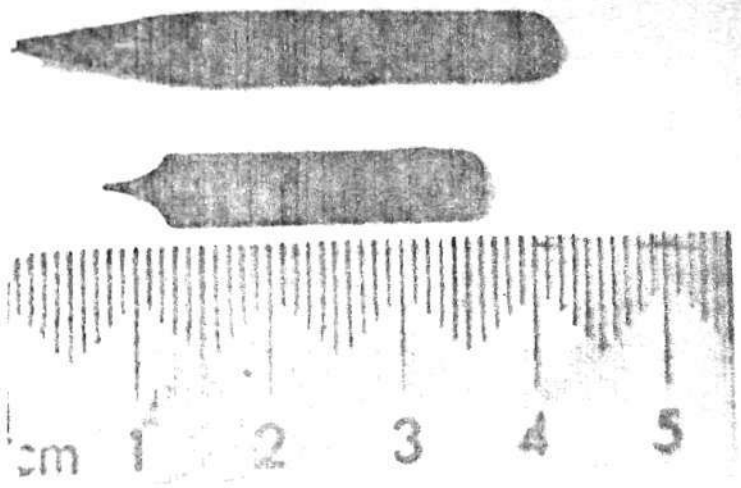


Fig. 20. The Esterbrook pen nib, M17, and the more usual type, M18.

The metal small finds cover quite a range, from the inventoried pen nibs, cartridge cases and possible watch parts, to tin opener keys, fine wire mesh, harness rivets,tobacco tabs and canvas rings.

Pen nibs

So far these have been found only on the A site.

1.(M17) WRA 4B(1) Well preserved, rather square nib, with short point, possibly broken; ESTERBROOK & CO'S RELIEF lengthways on the nib,with 5 1 4 across the point. 3cm long.

Such nibs were available by 1906, as Lassetter's Commercial Catalogue lists the type.

2.(M18) WRA 5B(3) Very rusty but complete, long tapering point, rounded shoulders cut back into a rectangle. 4.4cm long, 1.1 to .7cm broad

3. WRA 5B(3) Similar incomplete nib.

4.(M19) WRA 5B(3) Similar nib, but point and shoulders more in one piece. 4.35cm long, 1.0 to .7cm broad.

5. WRA 5A(2) Incomplete nib, points broken, either M18 or M19 type.

6.(M20) WRA 4B(1) Part nib, most of points gone, plain rectangle, with rounded shoulders. Now 3.3.cm long.

7. WRA 5B(3) similar, also incomplete.

In a similar category, i.e. stationery supplies was a small brass fastener:

8.(M21) WRA 5B(3) Rounded head, squashed onto two small pointed "feet", head diameter .75cm, 1.1cm long.

The concentration of nibs, the fastener, and the pencil eraser, amongst other things, in 5B was most unusual. The finds came from the indented area in the western edge of the pavement, and it may be natural that such things collected around the edge of the pavement; anything falling onto the stone floor would be easily seen and picked up, but anything falling into dirt would be more difficult to see.

Cartridge cases were rare, but found on both sites.

1.(M43) WRA 4C(5) Good condition, 1.75cm long, diam. 1.1cm and around the top ELEY.



Fig. 21 : Cartridge cases.

2.(M48) WRA 11B(2) Good condition, 3.3cm long, diam. 1.3cm, around the top W.R.A.Co. 44 W.C.F. Made for Winchester rifle.

3.(M44) WRA 5E(1) Slightly squashed, 1.65cm long, diam. .9cm, with SB 320 around top.

4.(M49) WRD 16N(9) Smaller, 1.1cm long, diam. .65, with letter H on top.

5.(M47) WRD 18Q(3) Slightly squashed, 3.4cm long, diam. 1.9cm.

6.(M50) WRD 18N(1) Part only, now 2.5 cm long, diam. 1cm.

7.(M61) WRA 3E(1) Slightly squashed, 1.1cm long, diam. .7cm.

Two very small finds were small wheels or cogs, possibly from a watch or clock.

1.(M45) WRA 2APH1 Very small wheel?, diameter 1 cm.

2.(M46) WRD 21L(2) Slightly larger, cog? 2.4cm in diameter.

Tin opener keys were found all over both sites, most of the unused keys coming from the A site. As keys were used to open sardine type cans and the taller round and rectangular cans, those retaining any part of the can have been sub-divided into the two types (sardine cans left the wide can top on the key, the side opened cans left only a thin strip).

Unused keys:

Area	Long	Short
WRA		
1A(2)	8.5cm long	
1B(1)	8.9	4.1
2G(2)		4.2
3A(3)	8.4	
3C(3)		4.1
3D(2)		4.1, 3.5
3E(1)		2 at 2.4, v. eaten
3F(5)		4.1
(6)	8.5	
(F1)		2 at 4.2
4C(2)	7.2	4.1
(5)		3.8, v. eatern

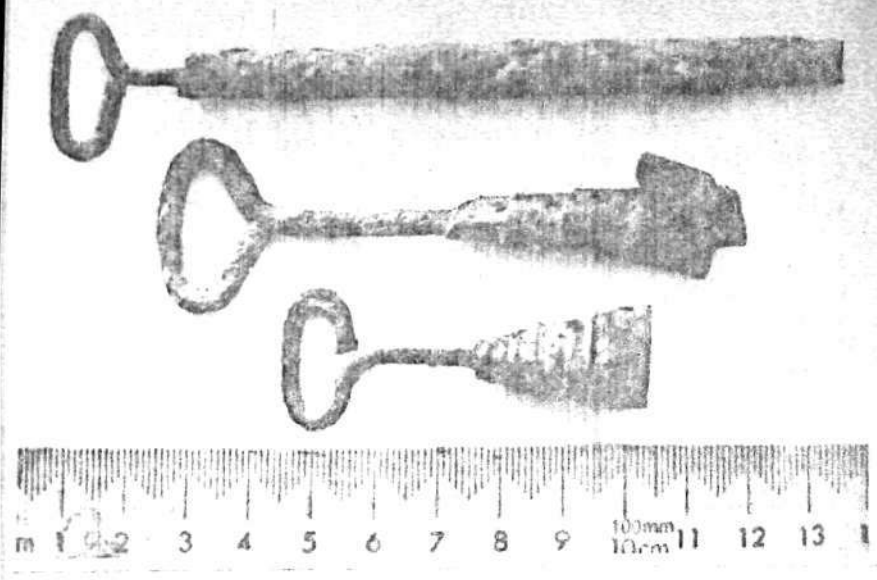
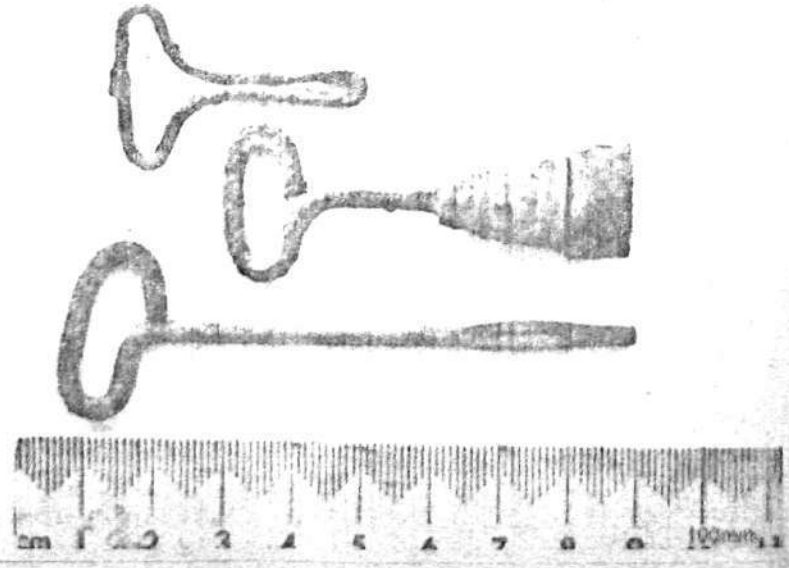


Fig. 22a: Tin opener keys with different thicknesses of tin.

22b: Keys, showing different example from WRA 3D(2).



Area	Long	Short
4E(1)		3.4, very eaten
5D(4)	6.8, rusty	
5C(2)		4 at 4.1, plus a half
6C(2)		4.8
WRG		
10L(1)	9.5	
WRD		
21L(2)	8.5	
24Yb(2)	9.3	
24Xd(2)		4.2

Keys from sardine cans, or similar, all from WRD:

18P(1) 9.3 long, including tin
11S(1) 9.8 " " "
24W(1) 11.8 " " "
23Zb(1) 9.4 " " "
24Xd(2) 9.6 " with just the beginning of the can top.

Keys from side opened cans:

WRA

2G(1) 5.9 long, including tin

WRD

21Q(4) 8.4 " " "
24Xa(2) 2 at 4 cm long, " "
24Xd(1) 3.8 long " "
(2) 2 at 3.9 long " "
23Zb(1) 4.1 " " "

WRG

10J(1) one at 7cm, 1 at 4.8, 1 at 4.1, 3 at 4cm, with tin.
10K(1) 4.8 cm long, with tin
10L(1) 4.0 " " " "

There was one unusual key, if it is a key, made of wire with the two ends joining along the top, from WRA 3D(2).



Fig.23: Tobacco tabs, showing different shapes.

The next largest category were the tobacco tabs. These had caused me some problems in identification, as the most common ones had IXL on them, which for some reason I associated with jam. However, one of my helpers gave me the clue, and in Alice Springs I was able to see similar tabs still being used with plug tobacco. The tobacco is cut into small squares within the main block, and to keep it together until required, these little tabs are attached by the small triangular points. Most were round, either IXL or Conqueror brands, with some rectangular, one double round, and one diamond shape:

Area	IXL	Conqueror	Double	Rectangular	Diamond
WRA					
2A(2)	1				
(3)					1
3F(2)		1			
4B(1)		1			
5A(2)	1				
5D(4)	1				
6A(2)	1				
10A(2)	1				
10B(2)	1				
11B(F1)	1				
WRD					
21L(2)	1				
(4)		1			
19P(6)		1			
20P(5)	1				
19Q(3)	1				
20QPh3				1	
21Q(1)	1				
23R(1)		1			
(2)		1			
24R(1)		3			
25R(1)				1	
12S(4)		1			
24S(3)		2			
25S(4)		1			
15T(1)	1				
WRH			1	1,PANTHER	

I am indebted to Mr. D.R. Wills, Managing Director of W.D.& H.O. Wills (Australia) Limited who was able to tell me that his company was first formed in 1904 as the British Tobacco Company Limited, and that one of the founders was Mr. Hugh Dixon who owned the Conqueror factory, and that W.D. & H.O. Wills produced the IXL brand. In 1909 the sale of plug tobacco accounted for 79% of sales, and now only three brands are sold, accounting for only 0.5% of sales. The Conqueror and IXL brands were last produced in 1924. Mr. Wills also produced a list of plug tobaccos manufactured in 1909; four brands were imported, Victory, Derby, Diadem and Lucy Hinton, while the rest were made in Australia:

HAVELOCK	
EUREKA	CONFINED TO SOUTH AUSTRALIA
YANKEE DOODLE	
CHAMPION	
SIGNET	CONFINED TO NEW SOUTH WALES
CHALLENGE	
CONQUEROR	
HAZEPPA	CONFINED TO NEW SOUTH WALES
RED SEAL	CONFINED TO NEW SOUTH WALES
SUNOL	CONFINED TO NEW SOUTH WALES
MY PET	CONFINED TO NEW SOUTH WALES
CONFIDENCE	MOSTLY VICTORIA
STARLIGHT	CONFINED TO VICTORIA
LUXURY	MOSTLY QUEENSLAND
KEYSTONE	CONFINED TO QUEENSLAND
MASCOTTE	MOSTLY QUEENSLAND
ARMY & NAVY	CONFINED TO NEW SOUTH WALES
HOME RULE	CONFINED TO NEW SOUTH WALES
AMERICAN EAGLE	MOSTLY SOUTH AUSTRALIA
TIP TOP	CONFINED TO WESTERN AUSTRALIA

Most of the wire mesh came from the D site, and was fine, probably from something like a meat safe, but one coarse piece came from the A site:

1. WRA 2G(2) Rough square of open mesh, which was probably used to close off the wind tunnel entrance, to prevent access by unwanted animals.

The fine mesh came in small and large pieces; 8 strands to 1cm.

2. WRD 19M(1) 1 small piece
3. " 16N(7) 1 medium piece
4 " 20N(1) 1 large piece 17.2 by 12.2 cm
5. " 21N(1) 2 small, 1 large approx. 28 by 16cm.
6. " 18P(1) 1 medium piece.
7. " 21P(1) 4 small and 2 medium pieces.
8. " 20Q(1) 2 small and 1 medium pieces.
9. " 20Q(2) 1 small piece.

The small harness rivets were scattered over both sites, and came in three forms: complete, with shank and washers at both ends; incomplete, with shank and one washer, and just plain washers.

Area	Complete	Incomplete	Washer
WRA			
2B(3)		1	
4A(2)			1
4C(2)			1
(5)		2	1
5B(3)		15	4
5/6C(2)		1	
10B(2)	1		
WRD			
20K(1)	1		
21N(3)	1		
13S(1)	1		
24S(1)	1		
12T(1)	1		
14T(1)			1

I think it is reasonable to presume, from this distribution, that the rivets found around the A site were from the stocks kept at the store, and that the complete rivets from the D site were lost from harness.

Reinforced rings or eyelets for canvas were rare, but all were 1.8cm broad. They were found in 21L(1), 19N(1) and (2), 17Q(3), 24R(2) and 15V(2), which hardly supports my theory that Structure C was canvas covered.

Nuts and bolts were fairly rare too

Area	Nut 6.2x2.3	3.9x2.5	2.3sq.	+ screw	1.35sq	+ screw
WRA						
2A(3)	1					
3A(2)					1	
5D(1)					1	
11A(2)						1
10B(1)						1
(2)						2
WRD						
16Q(1)			1	1	1	
20Q(1)		1				
(2)		1				
21Q(4)		3				
20P(2)					1	

Found around Structures A and B were some rectangular pieces of tin, possibly from the corner of tea chests or similar packing things. They were 12.8cm long by 4cm broad, with 2 holes at each end and 2 near the middle. Some were complete, but obviously the tin was usually folded in the middle, and so quite a few "halves" were found.

Area	Complete	Half
WRD 19P(6)		2
" 17Q(1)		1
(5)	2	
" 18Q(3)	1	1

One group of metal finds have been labelled packing-case tin, as strips of tin, in varying widths, usually with some holes and occasionally some nails, were found, particularly over the D site, and the rubbish scatter of WRG.

Area	1.0	1.1	1.2	1.3	1.4	1.6	1.8	2.0	2.1	2.2
WRA										
1A(1)					1					
(2)				1						
2G(2)				1						
3A(2)		1						1		1
3E(1)			1	1						
4A(1)										1
5A(1)	1									
5B(1)										
5DPh1				1						
11B(2)										1
WRD										
18K(1)								1		
19K(1)								1		
20K(1)								1		
21K(1)	2									
16L(4)				3						
20L(1)										
21L(1)		1								
16M(2b)										
18M(2)							1			
20M(1)				1						
16N(8)				1						
(12)			1	1						
18N(1)										
19N(1)			1							
17N(3)			3							
20N(3)				2						
21N(3)				1						
18P(2)			1							
19P(2)				2						
(3)				1						

Area	1.0	1.1	1.2	1.3	1.4	1.6	1.8	2.0	2.2	
17Q(5)								1		
18Q(3)								1		
(5)			2						1	
20Q(1)		3	1							
(2)	2	1								
(4)	1									
21Q(1)			1							
(3)	1									
(4)	2	1							1	
25R(1)							1			
12S(1)										2.5
13S(1)		1								
15S(1)					1					
(2)			1							
23S(1)			1							
(3)										2.6
WRG										
10I(1)		2		1			1			
10J(1)	2	2	4	2						
10J/K	2	1		1				1		
10K(1)	1	4	4	3		2	1			2.9
10L(1)	2	2	5	4			1	3		

As well as the plain tin, there were three lengths with two rows of raised bumps, one from 18L(2) which was 1.8cm wide, plus two others from 20N(1) and (2), the same width. One unusually narrow piece, only .7cm wide, was found in 13S(1).

Also very widespread over both sites was the appearance of wire, mostly No. 8 gauge, and obviously one of the most useful things to have around the camp. The wire is usually looped, twisted or hooked, and the looped examples, plus some of the twisted ones often have a small circle at one end. At first I thought these circles may have been used for holding candles or as hooks, but finally decided they were far more likely to have been the result of straining the wire as tightly as possible around the posts it was holding together. Most of these twists and loops are quite big and often in a figure 8 or S shape.

Area	Twist	Hook	Circle	S shape	Loop	Bent	Straight
WRA							
1A(5)						3	
PH4					2 tog.		
1C(6)	1						
2A(2)	2 tog.						
2B(3)			1				
3E(1)		1					
3F(F2)	2 tog.						
4A(1)				2			
(2)				2			1
4B(1)				1			
4C(1)	1						1
4E(1)						1	
5A(3)			2				
5C(1)							1
(2)	2 tog.						
6A(1)				1			
6C(2)	1						
Ph2				1			
11B(F1)			1				1
WRD							
18K(1)	1		1				
19K(1)	5						
20K(1)	1						
16L(1)	1						
19L(1)	1		1				
(4)	1						
Ph3	1						
20L(1)					1		
21L(1)					1		
16M(1b)					1		
(2b)					1		
18M(1)	1						
20M(1)					2		
(2)					1		
21M(1)		1			1		

Area	Twist	Hook	Circle	S shape	Loop	Bent	Straight
16N(1a)		2					
(8)		1					
17N(1)				1	2		
18N(2)	1						
19N(1)					1		
(6)					1		
20N(1)					1		
21N(1)			3				
(2)	1						
17P(1)					1		
18P(1)			2				
21P(1)					1		
19QPh1			1				
20Q(1)	1	1					
Ph1							1
19R(2)			1				
20R(1)			1				
21R(1)	1						
23R(1)	1						
24R(1)							1
(2)							1
25R(1)		1					
11S(1)			2				1
(2)		1			2		
12S(1)	2 tog.						
(2)			1				
13S(1)	1		1				
14S(1)	1						
15S(1)	1						
23S(3)	1	8					
25S(1)			1				
13T(1)	2 tog.						
14T(1)	2 tog.						
15T(1)							1

Some of the wire was considerably finer, often just twisted or looped, but some examples were shaped like hairpins:

Area	Twist	Loop	Hairpin?
WRA			
2C(2)		1	
5D(2)	1		
5/6C(1)	1		
WRD			
19L(2)	2		
20L(1)	1		
21L(2)	1		
16M(2b)		1	
19Q(1)			1
11S(2)	2		
14S(1)	1		
14T(1)	1		
15T(3)			1
14V(1)	1		

As well, from 17P(5) came some finer wire that looked very like a spring, possibly from a mousetrap?

Wire rope came from a very few areas:

WRA

2D(1) 11 strands,

WRD

13S(1) 12 strands

14S(1) 4 lengths with 12 strands, one with 11, 2 with 10.

Finally, from 18R(1) were two lengths of No.8 wire, or possibly thicker, looped into the shape of a cooking pot handle.



Fig. 24: Round shafted, flat headed nails.

Nails were profuse on the site, mostly round shafted with a flat or rose head, with some square shafted nails, the very occasional triangular shafted nails, horsehoe nails, roofing nails and a very few floor nails. Their condition varied quite considerably, even within the same deposit, but it seems likely that the nails were all machine made, although it was occasionally necessary to manufacture some roofing nails by adding rough squares of tin to ordinary nails. Small tacks or clouts were also very popular, with their broad heads and short bodies. The nails are listed according to shaft and head type, indicating which were bent in any way which could indicate use; there were some variations in shaft diameters, usually between 25 and 40 mm. Although the nail lengths varied considerably, they are grouped into the metric equivalent of the old imperial divisions of a quarter of an inch.

Most nails fell within the 1½ to 2½ inch limits round, flat head:

Area	2.7	3.3	3.8	4.4	5.1	5.7	6.4	7.0	7.6
1A(1)			1b	1b					
(2)				1b 2	1b 1	1b			
(4)	1b								1b
Ph4			1b						
1B(1)			1		1b 1				
(3)					1	1b			
(4)				1b					
Ph2			1b						
Ph3				1b					
1C(1)				1b	1b	1			
(2)					1	1b			
(5)					1				
(6)					1	2b			
Ph2			1			1		1b	1b
2A(2)			2b	1b	2		1b		
Ph1			1		1				
2B(1)			1b	2b	2b				
(2)		1b	2	2b	1		1b		
(3)									1b
Ph1					1b		1		
2C(1)		1b 3	3b 2	2b	1b 2		3b	1b	
(2)		1	1b 2	1b	1b 3		1b 1		
(3)				1	3				
2D(1)		1b 2	1b	2b				1b	
(2)		1b 1	1b	3b			1		1
Ph2						1			
2G(2)			2b	1	3	1b 1			
3A(2)			1	1b	3b 1				
(3)				1	1b 1				
Ph4							1b		

Area	2.7	3.3	3.8	4.4	5.1	5.7	6.4	7.0	7.6
3C(3)		1	1	2b 3	6b 1	1b			
Ph2					1				
3D(1)	1	1	1		1b 1		1		
(2)		3	2b 2	1	1b 3		1b		
3E(1)	1b 2	1	3b20	2b 9	1b 4	1b	1		
(2)			2b 4		3	1			
3F(1)					4				
(2)		1b 2	2b 3	1b			1b 3		
(3)					1				
(6)			1b	1	1				
(4)				1	3	1b 1			
(F1)			1		1				
(F2)			1						
4A(1)					1				
(2)			1	3	1				
4B(1)		1	3			2	1		
4C(2)		2	2b 1	4	5				
(5)			1						
4E(1)			1b 1	2	1b				
5A(1)				2b	1				
(2)			1b						
Ph2			1						
5B(1)			1b 2						
(3)	1		1b	3	2				
5C(2)					1		2		
5D(1)				4b	2b	2b			
(2)		5	1	5b 2	1b				
(3)						1b			
(4)	1b 1			3b 2			2b		
5E(1)					1				
5/6C(1)							1		
(2)			1			1			
(4)				1					
6A(2)								2	
(3)					1		1		
6C(1)									1
(2)	3				5	1	6		
10A(1)					1b				
10B(1)						1	1		
(2)			2	1			2		
(F1)					1				
11A(1)		1			1				
11B(2)			1		2		1		
(F1)			1	2	1				

From the WRD site:

Area	2.7	3.3	3.8	4.4	5.1	5.7	6.4	7.0	7.6
16L(1)	1				3b				1b
(2)					1b				
17L(2)				1b	1b 2				
19L(1)			1	1b	1b 1				
20L(2)				1b					
16M(1a)				1					
(2a)					1b				
17M(2)		1b 1	2b 2		2b				
18M(1)		2b			2b				
(2)		3b		1b	1b	2b			
19M(1)				3b 1	3b	2b			
(2)				1b 1					
20M(1)				2b	1b 1				
(2)		1b	4	6b	2	1b			
21M(2)					1b			1b	
16N(1a)				1b		2b			
(2a)			1b	7b 3					
(3)		1b			4b	1	1b 1	1b	1
(5)				1					
(6)	1			7b		1b	1b		
(7)			2b	1b	1b 1				
(8)	1		1		1				
(12)			2b		2				
(13)		2	2b	1b	1b 2				
17N(1)				2b*	2b*	1b	2		
(4)			1b 1	3*	1b* 1*		1b		
18N(1)		1b 1*	1*	1b* 1*	3	1b 1	2		
(2)	1b				2b				
19N(1)				1b	1b				
20N(1)				1b 1	3b 4			1b	
(2)			1	1b 1	1b 1				
21N(1)			1b 1		2b				
16P(1)					2b				
(2)					1b 1				
17P(1)			1b	1b	3b				
(3)			2						
(4)					4				
(5)					10b 2		2b		

*blunt end

Area	2.7	3.3	3.8	4.4	5.1	5.7	6.4	7.0	7.6
18P(1)	1		1		1b 1		1b		
(2)			1b		1b		1b		
(3)		1b			3b				
(4)					3b 1				
19P(2)					1		3		
(3)			1						
(5)		1b	2b	10b 9	11b12	2b 4			
(6)				1b			2b		
Ph2					1				
20P(1)		1			1b	1b			1b
(2)			1b		2b				
(3)			1b 3	8b	4b				
(5)	1		1	1b	2b				
16Q(1)				1b 1	2b 2		1		
17Q(1)			1		3	2	1		
(2)							1		
(3)				1	2b 3	1b	1b		
(4)			3		1b 6	1b			1
(5)		3	2b		2b 9	1b	1b		1
18Q(1)				2b	1b	1b			1b
(3)		1	2b 1	2b 4	4b 4	1b			
(5)		1							
(6)		1b		1b					
19Q(1)			6b 4	3b 1	2b	1b	1b		1
(3)				2b					
20Q(1)		1b							
(2)	1	3b12	3b 8	2b10	7b16		3b		
(3)					2				
21Q(3)	1b								
(4)			3b 2						
18R(1)				1b					
(2)			1b		3b	1b 1			
20R(1)			3b 3		2		2b		
23R(1)			3b	3b	2b	1b	1b		
(2)					1b				
24R(1)		1b 1	3b 1	3b 1	3b 3	1b	2b		1b
(2)		2b 1	1b	1b	3b 2				
25R(1)			1b	2b	1b 1	1b			
11S(2)				2b	4b	2			
12S(2)					2b 3	3	2		
(3)					1b				
(4)					1				
(5)				1b	3b	1b 1	2b 1		
(6)					1b				
Ph1					5b				



Fig. 25: Very small nails, at least 3 pins.

Area	2.7	3.3	3.8	4.4	5.1	5.7	6.4	7.0	7.6
13S(1)			1b	1b 1	12b28	12b 1	5b 8		
14S(1)				2b	1b 4				
23S(3)					1 3				
(4)					1 2				
24S(1)					1 2b	1b			
(2)			1b						
(3)			1b 1		1b				
25S(1)			1b						
(2)						2b			
(3)		1							
(4)				1b	1b 1		2b		
11T(1)					1				
(2)			3b 2	2b 4	1		2b		
12T(1)				1b					
(2)		2b 1	3b 3	10b 9	1b 5	2b	1b		
13T(2)					1b				
(3)				1b	1b				
(4)					1				
15T(1)							1b		
(2)					2b				
15V(1)				1b					
(2)					2b 1	1b	1b		
24Xd(2)			1b		4b	1b		1b	

There were some very small nails, probably pins, 2.1cm long:

WRA 4C(2) produced one, shaft only 2mm thick.

WRD 20P(5) produced two, 3 and 4 mm thick
17Q(5) had one, 3mm thick, and
20Q(2) the same.

At the other end of the scale there were some very large nails:

WRA 1CPh2 had one bent nail 8.7cm long
5/6C Bedrock had one 11.8 cm long

WRD 18N(1) had one 9.2 cm long
24R(3) produced two, one 8.8 and the other 10.1cm long.

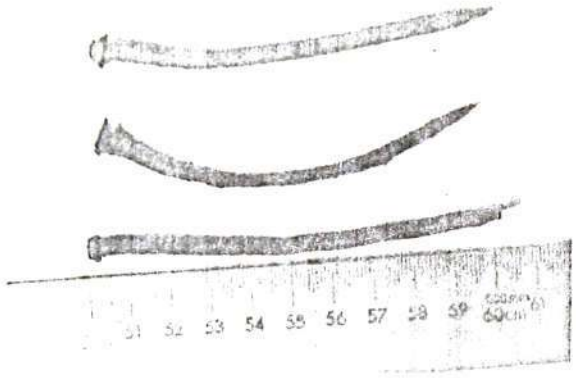


Fig. 26: Rose heads, in good and bad condition.

The other most common type had a round body with a thicker head, usually called a rose head:

Area	3.3	3.8	4.4	5.1	5.7	6.4	7.0	7.6	8.2
WRA									
1A(1)		1b	1						
(2)		1b							
(3)				1b					1b
(4)			1						
Ph1									
PH4				1b 1				1	
PH5					1b				
1B(1)		1b 2	2	1b					1b
(3)		1	1b						
(5)				1b					
Ph3				1b					
1C(1)				1				1b 1	
(2)								1	
(6)			1	1					
Ph2				1b 1					
Ph5			1						
2A(2)	1b		1b 1	1					
(3)				1b					
Ph1								1b	
								1	
2B(1)	1	1		1b 1					2b
(2)		1	1						
Ph1			1b						
Ph2		1							
2C(1)		1	2b 2		1b				
(2)	1		1b 1		1b		1	1b	1b
Ph1		1b					1		
2D(1)		1b		1b					
(2)		3	2b	1b					
Ph1		1							
3A(2)		1b							
(3)		1							
3C(3)	1		1	1	1	1b 2		1	1
3D(1)				1b 1					
(2)		2	1						
3E(1)		1	2	1b 4		1		1b	
(2)			1b 1						
3F(2)			1b 1		1b				
(4)				1					
(6)				1					

Area	3.3	3.8	4.4	5.1	5.7	6.4	7.0	7.6	8.2
4A(1)				1	1				
(2)		2							
(3)							1		
4B(1)				3					
4C(2)	1				1	1		1	
(5)			1						
(6)								1	
4E(1)		1	1					1	
5A(1)								1	
(2)				1b					
Ph2								1	
5B(1)			1						
(3)		1			1				
Ph1								1	
5C(2)					4			1	
(3)				2				1	
5D(2)			1b	1		1			
5E(1)		1							
5/6C(2)			1	1	1				1
Bedr.								3	1
6A(2)		1		1					1
Ph1								1	
6C(2)	1			1	1	3		3	
Ph2								1	
10A(2)					1b				
10B(2)				2				1	
11B(2)	1	1							
(F1)			1	1					
11A(2)				1					

Some of the nail heads were more like the modern bullet head nails:

3A(2) 1 1

2G(2) produced one only 2.7cm long.

Rose heads from the WRD site:

Area	2.7	3.3	3.8	4.4	5.1	5.7	6.4	7.0	7.6	8.2
16L(1)									1b	
20L(1)					1b 1					
21L(1)					1					
(2)			1b		2					
16M(1a)									1b 1	
17M(1)						1b				
18M(1)	2b		3		1b					
(2)		2	2		3b 1		1b			
19M(1)					2b					
20M(1)			1					1		
(2)		1			2b					1b
16N(1a)					1					
(3)					1					
(4)									1b	
(7)					1b					
(9)	1b			1b 1			1b		1b	
(12)	1		1	1b	1b					
(13)							1			
17N(4)	2		1		1					
18N(1)		1	1b 2							
(2)			1b 1		2					1b
19N(1)			1		1		1			
(2)			1b				1b			
20N(1)			1b							
(2)			1			1b				
21N(1)			1b 1							
16P(2)							1b		1b	
17P(1)						1b	1b		2b	
(2)									1b	
(3)					1	1b*			1b	
18P(1)							2b			
(3)							1b		1b	1b
19P(2)				1b					1b	
(3)			2		1b		1b			
(5)				2b 3	5b					
(6)			1b 1	1	2					
20P(1)					1b 1					
(2)			2b							

Area	2.7	3.3	3.8	4.4	5.1	5.7	6.4	7.0	7.6	8.2
16Q(1)			1b				2b			
17Q(1)							3b 1		2b	
(2)							1			
(3)					1b		3b			
(4)									1b 1	1b
(5)					2b	1b	2b 1		3b	1b
(6)			1		1b		1			
18Q(1)			1		1b	1b		1		
(2)								1b		
(3)					1b		2b 1		1b	
(5)							1b		1	
19Q(1)			4b 7	1b 4	3b 1	2b 1	1			1b
(3)				3b		1b 1				
20Q(1)									1b	
(2)			3b				1b 2		3b	1b
(3)				1		1b				
21Q(1)							1b			
(4)					1b					
17R(1)					2b 2		1b 1		4b 1	2b
(2)					6b 3		3b 1		1b	
(5)					2b 2		1b 2			
(6)					i				1b	
(9)					1		1		1b	1b
(10)									1b	
18R(2)					3b		5b 2		7b	
Ph1									1b	
(3)									1	
19R(1)			1b				1b			
(2)				1b			1b	1b		
(3)					1b					
20R(1)			2	2b			1b 2		1b 1	
23R(1)					1	1b	2b		2b	1b
(2)					1	1b				
24R(1)		1b			14b 2	1b 1	5b 1	1b	7b 1	1b
(2)			1		2b 1				3b 1	
25R(1)					1b 1		1b		2b	
11S(1)					1		2b			1b
(2)					9b		1b		1	
12S(2)					2b 1			1b		
(4)					1b	1b 1	2			
(3)				1b	3b			1b		
(5)					1b 1			1b		
(6)									1b	
Ph1					1b					

Area	2.7	3.3	3.8	4.4	5.1	5.7	6.4	7.0	7.6	8.2
13S(1)					4b		1			1b
14S(1)					1		1b			1b
23S(3)									1b	
(6)					1b					
24S(1)					1b 3		1b		1b	
(2)					2b	1b 1	2b		1b	
25S(1)				1		1b			1b	
(2)				1b						
(3)				1b	1					
(4)				1b	1					
11T(1)					2b					
(2)					5b	2b				
12T(1)					2					
(2)					2b	1b	1b	1b		
13T(2)					2b					
(4)			1b		3b 3					
14T(1)					1b					
15T(2)		1b		1b						
15V(1)			1b	1b	1b		1b			
(2)					1b		1b			

Again, there were some bullet heads found on the D site:

16N(7)					1					
19Q(1)						1				
24R(4)					1					
11S(2)									1b	
12S(3)							1b 1			
(2)					1b					
(6)									1b	
Ph1							1b			
13S(1)						3				
11T(2)						1b				
12T(2)							1b			
13T(4)							1b			
14T(1)					1b					
15T(1)						1b				

Some of the rose head nails were longer than those already listed:

	3¼"	4"	4½"	5"	5⅝"	6¼"
Area	9.5	10.2	10.9	12.8	13.3	15.9
WRA						
1A(1)		1b				
2A(3)		1b				
2B(1)					1b	
2CBedr.	1	1b				
2D(1)		1b				
3E(1)				1b		
3F(3)		1				
4A(2)		1				
4C(1)			1			
(6)		1				
5C(3)				1	1	
5/6CBedr.				1		
11B(F1)		1			1	
WRD						
17L(2)		1b	1			
18N(2)		1				
19L(1)				1b		
19N(1)		1b				
20P(1)					1b	1b
(3)		1				
16Q(1)		1b				
17Q(5)		1				
18Q(1)		1b				
(2)		1b				
20Q(2)		1b				
21Q(4)		1				
18R(2)	1b					
19R(1)		1b				
20R(1)	1b	1b				
24R(2)		2b	1	1b		
(3)		1b				
25R(1)		1				
24S(1)		1b				
25S(1)		2b				
(2)		1b				
15V(2)		1b	1			

Square shafted nails were less common, and mostly had a flat head:

Area	3.3	3.8	4.4	5.1	5.7	6.4	7.0
WRA							
1B(1)				1	1b		
2A(3)						1	
PH1		1					
2B(3)						1	
2C(1)				1*			
(2)					1		
3A(3)			1b		1		
3C(3)						1b	
3D(1)						2b	
3E(1)				1		2b	1
3F(2)				1		1b	1
(3)			1	1b			
4A(2)	1*			1			
4B(1)	1*						
4C(2)		1					
4D(2)			1*				
5A(1)					1b		
5C(2)					1*		
5/6C(2)		1b*	1*				
11B(2)		1b					
(F1)				1			
WRD							
18M(1)		2b				1	
(2)		1b 1	1				
19M(1)			2		1		
(2)			1b 1				
20M(1)			1b		1b		
(2)			2				
16N(13)		1b					
18N(1)	2b	2		2b			
(2)		5		1b	1b		1b
21N(1)							1b

Area	3.3	3.8	4.4	5.1	5.7	6.4	7.0
18P(2)		1b	1				
19P(2)			1b 1				
(5)			1b				
16Q(1)				1b			
17Q(3)		1					
18Q(2)			1				
19Q(1)		3b 1	1b				
(3)			1				
20Q(1)						1b 1	
21Q(3)		1					
20R(1)						2b 2	
23R(1)	2b 1	1b	1b	2b		1b	
24R(1)				1b			
(2)			1b				
(3)					1		
11S(2)						3b	
12S(4)		1b					
(8)					1b		
Ph1						1b	
13S(1)			1				
15S(1)					1		
24S(1)			1				
25S(3)				1b			
(4)			1			1b	
12T(1)							1
(2)					5b	2b	1
13T(4)						2b	
15T(2)				1b	1b		

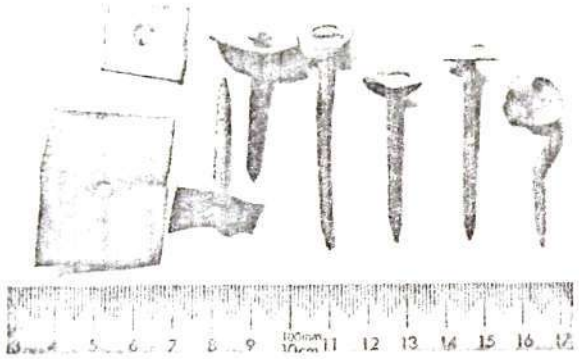


Fig. 27: Square and round roofing nails, showing variation in size of square roofing bits.

The roofing nails came in two types, those with a round washer, obviously manufactured, and those with roughly square washers, equally obviously made on site, when supplies were low. The round roofing nails came in 1"(2.6cm) 1¼"(4.4) 2"(5.1) 2¼"(5.7) and 2½"(6.4).

Area	2.6	4.2	5.1	5.7	6.4	
WRA						
1A(2)			5	1		
(4)				1		
1B(1)			2			
1C(1)			3			
(6)			2			
Ph2		1	6	2		
2A(2)			1			
2C(1)		7	1	1	3	
(2)		1				
2D(1)		1				
(2)		4				
PH1			1			
3A(3)			1			
3D(2)		1				
3E(1)				1		
3F(6)			1			
4A(2)			2			
5A(1)			1			
5D(2)			1			
6A(2)			1			
6C(2)			1			
6E(1)			1			
11B(1)				1		
(F1)		1				
WRD						3.8
18P(2)					1	
19P(2)	1					
(3)	2	1				
(5)	1	4				
Ph1	2					
(6)	4					1
20P(1)	2					
(3)	1					
(5)	1					

Area	2.6	3.8	4.2	5.1	5.7	6.4
17Q(5)					1	
(6)	1					
19Q(1)	4	1			1	
20Q(3)					1	
21Q(3)	1					
(4)	4					
18R(2)					2	
(3)		1				
19R(2)					1	
(3)		1				
15V(1)		1				

The square roofing nails varied more in size, no doubt as any nails available had to do the job.

Area WRA	1.9	2.6	3.8	4.4	5.1	5.7	6.4	7.0
1A(2)			2					
(4)					1			
1B(1)			1					
(3)					1			
1C(1)			1		1			
(2)					1			
(5)			1					
Ph4					1			
Ph5				1				
2A(3)					1			
2C(1)			5		1			
(2)			3					
2D(1)			2					
(2)			5					
Ph1			4					
2G(2)			1	1				
3D(2)			1					
5B(1)			1					
5D(2)		1						
6C(2)			1			2		
11B(2)			1					
(f1)			1					

Area	1.9	2.6	3.8	4.4	5.1	5.7	6.4	7.0
WRD								
17P(3)							2	
(4)							1	
(5)								1
19P(2)		1	1					
(3)	1							
(4)			1					
(5)	2						1	
20P(1)	12	1	3					
(3)	2							
16Q(1)			1				1	
17Q(3)							1	
(5)							1	
19Q(1)			11				1	
20Q(1)			2		1			
(2)	1		12					
21Q(3)		1	1					
(4)	3	1	7					
17R(1)							1	
(2)							1	
(9)			1					
18R(2)							2	
19R(2)			1					
20R(1)			7					
12T(2)		1						

21Q(3) also had one square roofing nail 15.4cm long.

The particular feature of the roofing nails is the difference in sizes used on both sites. With all the other nails, round or square shafted, flat or rose head, the majority of nails were between 3.8 and 6.4cm long (i.e. 1½ to 2½ inches), and this was much the same for both the A and the D sites. With the roofing nails, most of the 5.1cm or 2 inch nails were found on the A site, and only one of the D site, and the latter produced most of the 3.8 (1½") and 6.4(2½") nails. The problem about basing any conclusion on the presence or absence of nails on the A site is the difficulty in deciding if the nails were used for building, or were part of the stocks held at the store.



Fig. 24: Tacks, or clouts.

Tacks, or clouts, as one of my helpers called them, were common, especially on the D site. Most had a broad flat head, slightly waisted in the middle. They varied in size from 1.3(½") to 3.2cm(1¼").

Area	½" 1.3	¾" 1.9	1" 2.6	1¼" 3.2
WRA				
1A(2)		1		
1CPh2		1		
2A(2)	1		1	
2B(1)		1		
(3)		1	1	
(2)	1	2		
2C(1)			1	
3C(3)		1		
3D(1)			1	
3E(1)		2	4	
(2)	2			
3F(2)	1	1	2	1
4C(1)	1			
(2)	1	1		
5A(1)		2		
(2)		2	1	
5E(1)			2	
11B(2)			2	
WRD				
16L(1)	1	1		
(2)	1	2		
17L(1)		1		
(2)	1	1		
18L(1)		1		
(2)	6	6		
(4)	3	3	1	
19L(2)		2		
PH4	1			
PH5		1		
20L(1)		3		
(2)		1		
(4)		3		
21L(1)		1		
(2)	1			

Area	1.3	1.9	2.6	3.2
17M(2)	1	1		
(5)	1	1		
(6)	1	1		
Ph1	2	2		
18M(1)	5	5		
(2)	4	6		
19M(1)		1		
(2)	1			
20M(1)	1	1		
(2)	1	1		
21M(2)		1		
(4)		1		
16N(4)	1			
(6)		1		
(8)	3	1		
(9)	3	2		
(12)	3	5		
(13)	2	2		
17N(1)		3		
(3)	14	17		
(4)	1	4		
18N(1)	3	2		
(2)	3	6		
19N(1)		1	1	
(2)	1	1		
20N(1)		1		
(2)		1		
(3)		2		
21N(1)		1		
16P(2)			1	
(3)		10		
17P(1)	1			
18P(1)	1			
19P(6)		1		
20P(1)		1		
(2)		1	1	
(3)		2	2	2
Ph2		1		

Area	1.3	1.9	2.6	3.2
17Q(5)	1	4	4	
19Q(1)	1	1	4	
20Q(2)		1		
17R(1)	1	4	2	
(2)	4	8		
(6)		1		
(9)	1			
18R(2)	5	2	1	
(3)		1		
19R(2)	1	4		
20R(1)		6		
23R(1)	3	3		
(2)		1		
24R(1)	3	1		
(2)	3	2		
25R(1)		1		
11S(2)		5	1	
12S(3)		1		
(4)		1		
Ph1		2		
13S(1)	1	4		
24S(2)		3		
(3)	2	1		

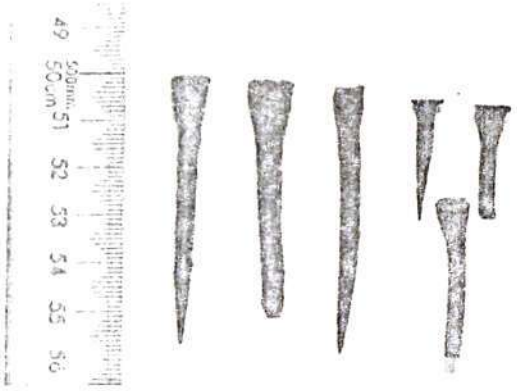


Fig. 29: Horseshoe nails, long and short.

Horseshoe nails were not as numerous as might have been anticipated, and came in quite a range of lengths:

Area	2.6	3.3	3.8	4.4	5.1	5.7	6.4	7.6
WRA								
2A(2)			1					
2B(3)				1				
3A(2)			1					
3C(3)							1	
3E(1)							2	
5C(3)						1		
6C(2)						1		
10B(1)					1			
11B(2)						2		
WRD								
16N(9)	1							
(12)	1							
17P(1)		2						
20P(1)							3	
16Q(1)		1		1				
17Q(4)								7.6
19Q(1)			1					
(4)						1		
21Q(1)				1				
(4)						1		
11S(2)						1		
25S(1)						1		
15T(2)	4	4	1					

In view of the general scarcity of these nails, it is interesting to see that nine came from 15T(2), from close to the forge fireplace. Most of the others tend to come from the edges of structures, which is only to be expected; horses would not be losing nails or shoes inside any of the domestic buildings, and would not be encouraged inside the store.

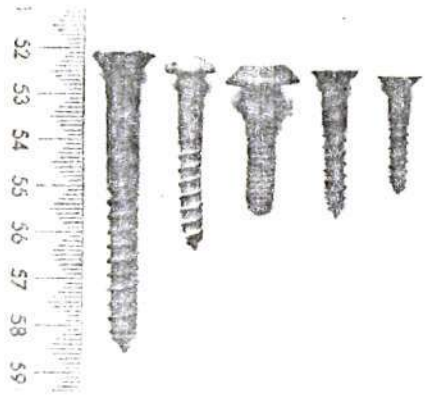


Fig. 30: Variations in size and type of screws.

Screws were comparatively rare, but came in the usual range:

Area	1.9	2.6	3.2	3.8	4.4	5.1	6.4	
WRA								
2A(2)		2					1	
2C(1)			1					
(2)						1		
2D(1)					1			
2G(2)					1			
3D(1)		1			1			
3E(1)					1			
3F(1)						1		
(2)						1		
5D(1)		1						
(4)				1				
6C(2)			1					
11B(F1)				1		1		
WRD								
17N(1)	1							
(4)				1				
20N(4)								7.4
21N(3)				1				
19P(5)	1							
20P(3)			1					
16Q(1)		1	3	2				
17Q(5)			1					
18Q(1)		1						
20Q(1)						1		
(2)		1		4		9	3	
21Q(4)		1		1		1	1	
17R(5)	1							
20R(1)						2		
24R(2)		2						
23S(3)	1							
14T(2)				2				
15V(2)			1					

Another small group of nails were those with a rectangular shaft, with a flat but thick head:

Area	2.6	3.3	3.8	4.4	5.1	5.7	6.4
WRA							
1C(2)							1
2C(1)							1
2D(2)							1b
3C(2)							1b
3E(1)							1b
(2)						2b	
3F(2)			1b 2*				
(4)					1*		1
(5)		1*					
4E(1)			1*				
5C(2)					1		
6C(2)						1	1*
WRD							
17M(2)			1				
18M(1)	1						
(2)	2		2*	2*			1
19M(1)					1		
16N(4)		1	1				
16P(2)						1	
20P(1)							2b 1
18Q(3)				1			
19Q(1)			2b 1	1b			
20Q(2)							1b
(4)							1b
11S(2)			1				2*

*blunt end.

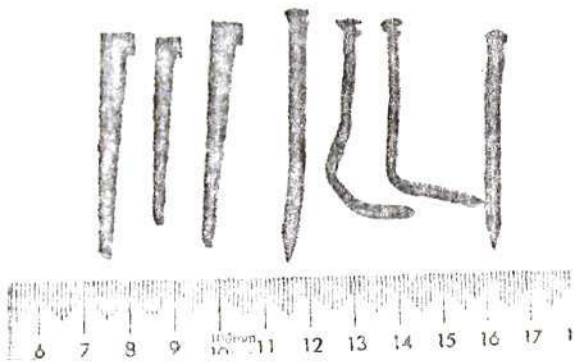


Fig. 31a: Floor brads and nails

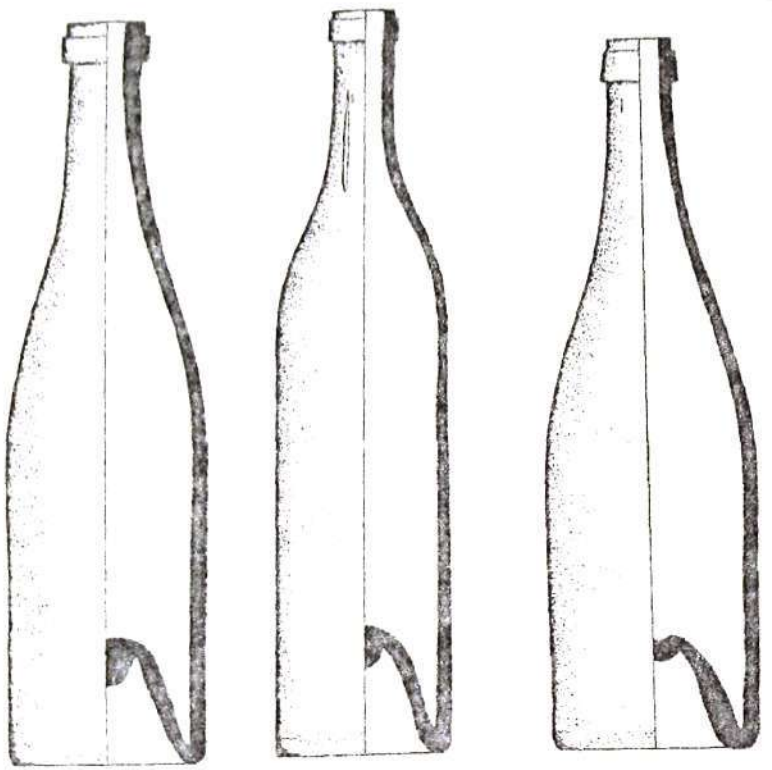
b: Triangular nails.

Last of all, three groups of very uncommon nails: two types of floor nails, and some with a triangular shaft. The floor nails were mostly of a flattened round shaft, with diagonal grooves down both sides. These were identified by someone who had just used the same sort of nails on his floorboards, and were grooved to stop them from coming out because of the vibrations from walking on the floor. The very rare floor brads were identified from an article on their manufacture in a book, How It Is Made, by

Area	Brads	Grooved Floorboard nails			
	5.1	3.8	5.1	5.7	6.4
WRA					
1APh5	1				
2A(2)					1
2B(1)	1				
6C(2)			1		
WRD					
18M(2)					2
19M(1)				1	
21N(1)				1	
17R(2)		1			
24R(1)				1	
25R(1)					1
15V(1)					1b

The triangular nails were not numerous, and the concentration in 3E might indicate that they were in stock at the store, rather than in great use.

Area	3.8	4.4	5.1
WRA			
2D(2)		1	
3E(1)	6		4
(2)		2	
6C(2)	1		
WRD			
20N(1)		1	
21N(3)		1	
Ph4	1		
11S(1)		1b	
12S(8)		1	
12T(1)		1	
(2)	1b		
15T(2)	1		



Illus. 32. All drawings at half size unless stated otherwise.
a) G420 b) G146 c) G144

The Glass

Most of the glass came from bottles, and all but three of those were broken or slightly chipped - it is probable that the bottle hunters had been to the area, and picked up all the good surface bottles. The bulk of the glass could be divided into green and clear, but there were problems in subdividing these two main groups, and even the smaller groups of brown and blue showed some variation in shade. The fact that the glass can vary in shade, depending on its position on the bottle (i.e. the base is thicker and therefore darker) was one problem, and another was the necessity of working on the glass over a long time which may mean that the subdivisions are not always consistent. The bulk of the green glass is plain green, with olive, emerald and pale green variations; the divisions are further complicated by the heavy white patination on much of the glass. The clear glass presented other problems, with aqua and purple tinted fragments in pale to deep hues. Some of this could be natural to the glass, but much of it was brought about by heat from the sun or from fires reacting with the glass. In some cases joining fragments could vary from clear to purple and so the "clear" glass has been classified on shape as much as on colour. The glass is listed with the best and most complete example first, with full description, followed by lists of similar fragments, giving provenance, colour, whether more or less complete, diameters in centimetres, and weight in grams.

The green glass

Nearly all the green glass came from bottles containing alcohol, and fortunately we found a complete example of the most common type of wine or beer bottle, on WRA site:

1. (G420) WRA 1A(Ph3) Complete green bottle, 30.5cm. high, base diameter 8.8cm. with high kickup, flat topped and big pontil mark; applied ring and chamfered lip, diameters 3.1 to 1.7cm. Heavy white patination over most of bottle, plus a black deposit on one side and most of base - part of the rubbish dumped in the post-hole. Very rounded base. Weight 1160g.

There were two other bottles found on the WRD site, within Structure D, broken but almost completely reconstructed, which are similar to G420, with slight differences in colour and lip.

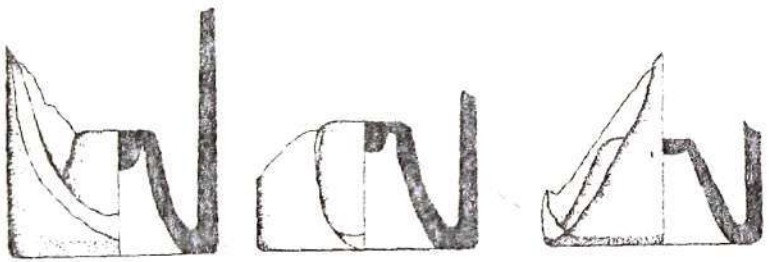
2. (G146) WRD 23S(1) Pale green, high kickup, rounded top but smaller pontil mark, rounded base diam. 7.5cm.; applied ring and rounded lip, diam. 2.55 to 1.9cm., several large air bubbles. Height 34cm., weight 681.40g.

3. (G144) WRD 23S(1) Olive, high kickup, dimpled top but small pontil mark, rounded base diam. 8.5cm.; applied ring and rounded lip - possibly for a crown seal? - slight bulge below ring, diam. 2.3 to 1.8 cm. Height 29.3 cm., weight 796g.

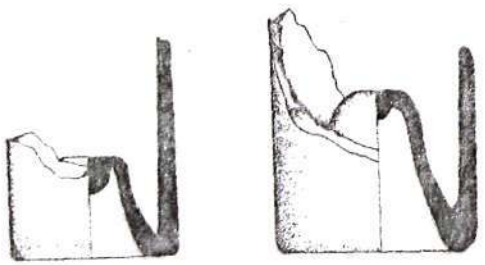
Most of the neck fragments are easy to group, with few examples similar to Nos. 2 and 3, G146 and G144; the bases show some variation in size and type.

The following necks have an applied ring and chamfered lip.

4. (G63)	WRD	17Q(3)	green	3.0-1.8	40.24
5. (G96)	"	17Q(5)	"	2.6-1.8	17.48
6. (G362)	"	15T(1)	"	2.8-1.7	175.87
7. (G406)	"	21R(1)	"	2.9-1.8	72.93
8. (G405)	"	21R(1)	" 2 frag.	2.9-1.8	140.45
9. (G417)	"	15S(1)	" 4 "	2.6-1.8	171.48
10. (G408)	"	21R(1)(	"	2.9-1.8	111.14
11. (G409)	"	21R(1)	"	2.9-1.8	86.71
12. (G412)	"	21R(1)	"	2.8-1.8	44.84
13. (G413)	"	21R(2)	"	3.0-1.8	132.77
14. (G37)	"	21Q(1)	" most	3.0-1.9	108.33
15. (G39)	"	21Q(1)	" "	2.9-1.8	92.88
16. (G44)	"	21Q(1)	" "	2.8-1.8	
17. (G76)	"	21L(1)	" "	2.8-1.8	23.43
18. (G82)	"	19P(6)	" "	2.9-1.8	21.07
19. (G64)	"	17Q(3)	" half	2.8-1.8	10.82
20. (G45)	"	21Q(1)	" "	2.9-1.8	32.66
21. (G77)	"	21L(1)	" "	2.9-1.8	14.52
22. (G69)	"	19M(1)	" part	2.8-1.8	12.20
23. (G75)	"	16M(2b)	" "	2.9-1.8	18.00
24. (G78)	"	21L(2)	" "		9.03
25. (G92)	"	21Q(4)	" "		68.04
26. (G93)	"	21Q(4)	" "	2.7-1.8	22.46
27. (G154)	"	21K(1)	olive	2.7-1.8	
28. (G411)	"	21R(1)	brown	2.8-1.8	53.19
29. (G407)	"	21R(1)	pale gr.	3.0-1.7	106.82
30. (G414)	"	21R(2)	"	2.8-1.8	76.80
31. (G418)	"	15S(1)	em.gr. 2frag.	3.0-1.9	282.38
32. (G419)	"	15S(1)	dk. em.	2.8-1.8	105.49
33. (G9)	WRA	4B(1)	green frag.		5.67
34. (G11)	"	4C(4)	" part	2.9-1.8	10.89
35. (G121)	WRG	10L(1)	green	2.8-1.8	140.84
36. (G184)	WRD	16-22W(1)	green	2.9-1.8	105.45
37. (G241)	"	24Yb(2)	"	2.7-1.8	120.15
38. (G330)	"	22Yc(1)	"	2.7-1.7	130.80
39. (G358)	"	22Yd(1)	"	3.0-1.8	266.00
40. (G342)	"	24Xc(1)	brown	2.7-1.8	57.11
41. (G374)	"	19L(4)	green	3.1-1.8	31.06
(G378)	"	18L(1)			
42. (G375)	"	19L(4)	"	2.8-1.8	22.53
(G379)	"	18L(2)			
43. (G193)	"	24W(1)	brown	2.8-2.0	



Illus. 33 a) G388 b) G390 c) G223
d) G356 e) G288 - flat topped kickups



Necks similar to No. 2, G146, and same pale green:

44. (G147)	WRD	23S(1)		2.5-1.85	95.87
45. (G371)	"	12U(1)		2.5-1.9	194.16
46. (G322)	"	22Yc(1)		2.3-1.85	45.54

This example still has some thin wire twisted beneath the applied ring and partly over the mouth. Lip is rather chipped.

One neck and three fragments show developments in the rounded lip from both No.2 and No.3, G144:

47. (G23)	WRD	20Q(1)	emerald green, lip rounded at mouth and on sides	3.0-1.8	46.55
48. (G14)	WRA	3F(1)	2 brown fragments, with channel between rounded lip and applied ring		18.00
49. (G94)	WRD	21Q(4)	half brown neck, very like No.48 above,	2.9-1.9	16.94

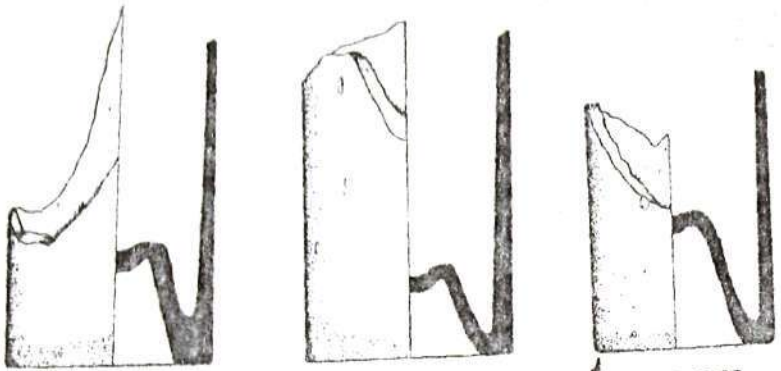
Other neck variations:

50. (G329)	WRD	22Yc(1)	olive, applied ring but straight sided lip flat on top	2.8-1.9	146.47
51. (G410)	"	21R(1)	olive, with applied ring, but lip stands higher, and is slightly chamfered	2.7-2.1	
52. (G12)	WRA	6C(ph1)	pale green, same as No.51 above.		

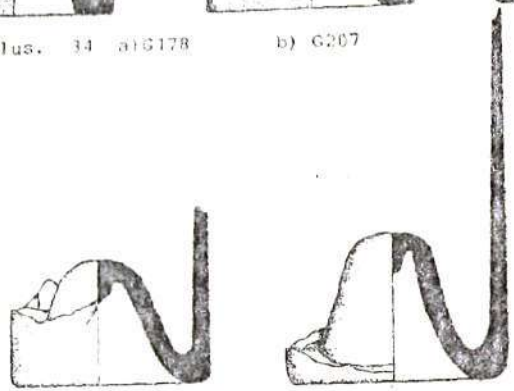
Most of the bases that can be tentatively classed as belonging in the three main groups as shown by Nos. 1,2 & 3 examples and had high kickups which were either flat, rounded or dimpled on top, as in those three examples. Within these groups the shape of the kickup does vary quite considerably, as is shown in the drawings, but I am not sure of the significance, if any, of these variations.

Bases with obvious pontil, flat topped kickup:

53. (G129)	WRG	10E(1)	em. green, part		213.06
54. (G130)	"	10L(1)	green, part		96.32
55. (G40)	WRD	21Q(1)	green	9.2	309.71
56. (G42)	"	21Q(1)	" most	8.4	229.00
57. (G388)	"	21R(1)	"	9.0	361.81
58. (G390)	"	21R(1)	" most	9.0	395.86
59. (G395)	"	21R(1)	pale gr.	8.7	234.07
60. (G396)	"	21R(1)	" " part	8.9	279.18
61. (G402)	"	21R(1)	" "	7.4	385.80
62. (G147)	"	23S(1)	green part		102.68
63. (G416)	"	15S(1)	dark gr. part	8.1	160.71
64. (G356)	"	22Yd(1)	green	6.9	270.05
65. (G223)	"	23Yb(1)	" part		110.40
66. (G224)	"	23Yb(1)	" half	8.9	160.50
67. (G288)	"	24Yb(1)	" part	7.2	249.00
68. (G289)	"	24Yb(1)	pale gr. part	7.4	109.86

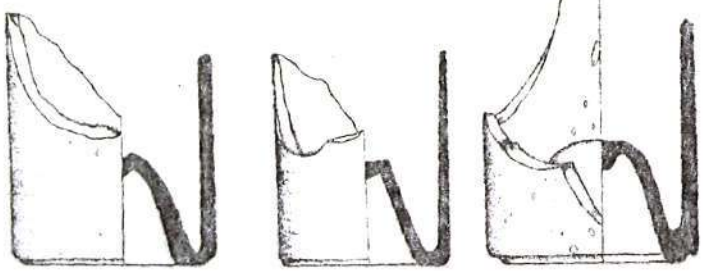


Illus. 34 a)G178 b) G207 c) G137



d) G117 e) G389

f) G397 g) G47 h) G393



69.(G310)	WRD	24Xd(1)	green	7.0	389.44
70.(G176)	"	24Xa(1)	"	8.9	405.20
71.(G209)	"	22Za(1)	"	7.1	138.37
72.(G210)	"	22Za(1)	"	8.7	368.00
73.(G208)	"	22Za(1)	olive	7.1	222.82
74.(G247)	"	23Za(1)	green	8.8	538.00
75.(G249)	"	23Zb(1)	"	8.3	228.83

Fewer bases had a dimpled top to the kickup:

76.(G91)	WRD	21Q(4)	green part		184.27
77.(G178)	"	16-22W	"	9.0	447.80
78.(G207)	"	22Za(1)	olive	8.6	616.00
79.(G137)	WRG	10K(1)	brown		461.00

Only two had a rounded top to the kickup:

80.(G117)	WRD	23Xd(1)	brown		394.00
81.(G389)	"	21R(1)	green most	9.0	289.38

A group of similar bases had a definite ridge around the base, but could be grouped into similar kickup types, rounded, flat and dimpled.

Most were dimpled:

1. (G22)	WRD	20Q(1)	green	8.7	768.00
2. (G90)	"	21Q(4)	olive	8.5	278.00
3. (G248)	"	23Zb(1)	"	8.5	277.96
4. (G386)	"	21R(1)	green	8.9	337.56
5. (G387)	"	21R(1)	"	8.7	270.37
6. (G392)	"	21R(1)	dark em.	8.5	392.26
7. (G397)	"	21R(1)	" "	8.5	377.91
8. (G398)	"	21R(1)	" " lopsided	8.5	365.45

Less obviously ridged, but still dimpled:

9. (G179)	WRD	16-22W(1)	green	8.8	409.50
10.(G180)	"	16-22W(1)	" part	8.8	200.86
11.(G249)	"	23Zb(1)	green, most	8.3	228.83
12.(G326)	"	22Yc(1)	"	8.5	394.58
13.(G327)	"	22Yc(1)	brown	8.5	357.74
14.(G394)	"	21R(1)	green	8.5	394.58

Some were flat topped kickups:

15.(G43)	WRD	21Q(1)	green, half		188.76
16.(G47)	"	17Q(1)	olive	7.4	243.07
17.(G415)	"	15S(1)	"	8.4	224.48

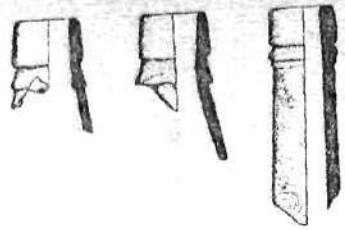
Only one had a rounded top:

18.(G393)	WRD	21R(1)	green lopsided	8.6	394.41

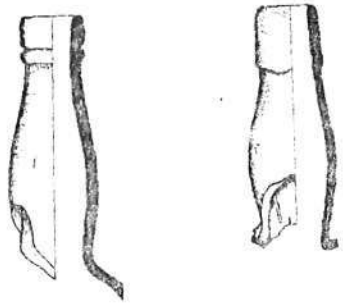
One ridged base had lost its kickup:

19.(G341)	WRD	24Xc(2)	brown		114.92



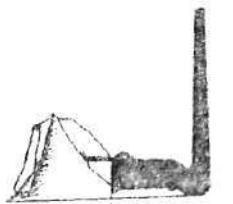


Illus. 35 a) G357 b) G311 c) G359 d) G226



e) G177 f) G227

g) G324





One ridged base had a low, even kickup, with a small pimple pontil:

1.(G357)	WRD	22Yd(1) em. green	6.5	181.28

Equally unusual was a medium kickup, almost triangular in shape, slightly ridged base:

2.(G391)	WRD	21R(1) olive	7.8	161.69

Miscellaneous neck fragments, possibly from spirits bottles, all with double applied lip, straight or flared neck:

1.(G21)	WRA	11B(2) olive		33.63
2.(G343)	WRD	24Xc(2) " frag.		9.52
3.(G311)	"	24Xd(1) "	2.8-2.0	33.89
4.(G359)	"	22Yd(1) green	2.8-2.2	37.07
5.(G226)	"	23Yb(1) dk. em.	2.7-1.6	76.17
6.(G32)	"	19P(1) green, frags.		20.53

One with applied lip and collar, bulging neck:

7.(G177)	"	24Xa(1) olive		147.11

Also with bulging neck, but single applied lip:

8.(G227)	"	23Yb(1) olive	2.6-2.0	65.00

It is possible that some of the necks from the above group belonged to some of the bases listed below. In the first group are nine whisky bottle bases, identified by the lettering on the base: around the edge, P DAWSON DUFFTOWN GLENLIVET. The bases found show some variations in kickup; the first had the highest of the low kickups, with an inner ring around a very flat centre, no pontil mark:

1.(G182)	WRD	16-22W(1) green	8.8	288.98
2.(G181)	"	16-22W(1) brown	8.3	271.08
3.(G286)	"	24Yb(1) green	8.8	244.29

One incomplete base had a medium kickup, lopsided, with central pimple pontil:

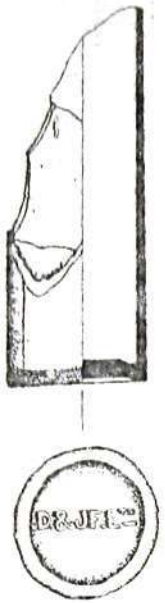
4.(G236)	WRD	24Ya(1) green	8.8	274.98

Three had an inner ride and pimple pontil:

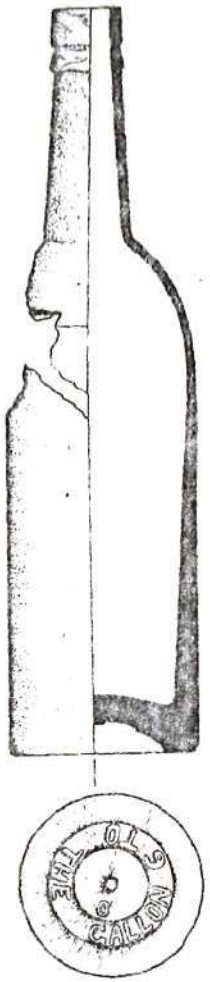
5.(G245)	WRD	23Zb(1) brown	8.8	362.39
6.(G353)	"	22Yd(1) " part	8.7	160.88
7.(G229)	"	24Xa(2) "	8.3	223.50

Finally, two had a very low, even kickup and pimple pontil:

8.(G324)	WRD	22Yc(1)		228.00
9.(G174)	"	24Xd(1) brown	8.8	176.80



Illus. 36 a) G188



b) G400

Two other marked bases were even more unusual, and probably fit into the medicinal or quasi-medicinal category:

10.(G188) WRD 24W(1) Unusual leaf green base with joining body fragments, side seams, some air bubbles, low even kickup with D & J F Ltd across the middle. Diam. 6cm, weight 241g.

11.(G194) WRD 24Yd(1) Green, base and most of body, side seams, some air bubles, low even kickup, with DR J G B SIEGERT & HJORT around the edge. Diam. 6 cm, weight 235.39g.

This bottle probably contained bitters. One advertisement for this company read:"Angostura Bitters(Dr. J.C.B. Siegert & Sons) Ltd. Famous Since 1824. Factory at George Street, Port of Spain, where thw World Famous Angostura Aromatic Bitters and Siegert Rums are produced. One of Trinidad's oldest industries and one of the very first to export finished products to the outside world." An 1870s testimonial averred its value for many ailments. There are at least two differing base markings, one as in the WRD example, and another with Dr. Siegert Cd Bolivar, which may be earlier. (Information from J.C. Tibbitts, Chips from the Pontil, 1963).

One brown bottle, probably once containing spirits, was found in the small bottle dump near Structure A, and reconstructed:

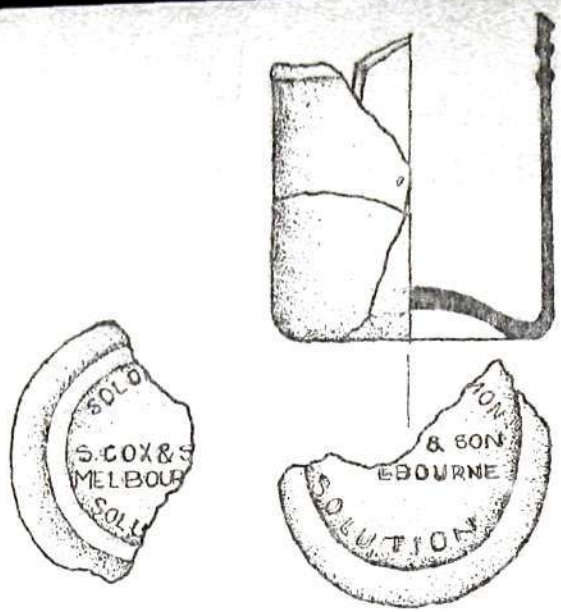
12.(G400) WRD 21B(1) At least 17 fragments making up most of the bottle, giving the full height and profile. Base has low kickup, with 6 TO THE GALLON around the edge; diam. 7.2cm. Double applied lip, discoloured by remnants of original lead cap, diam. 2.7 to 1.9 cms Height 30.5cm, weight 427g.

One other similar base was found in the same dump:

13.(G401)	WRD 21R(1) also brown	7.3	306.00

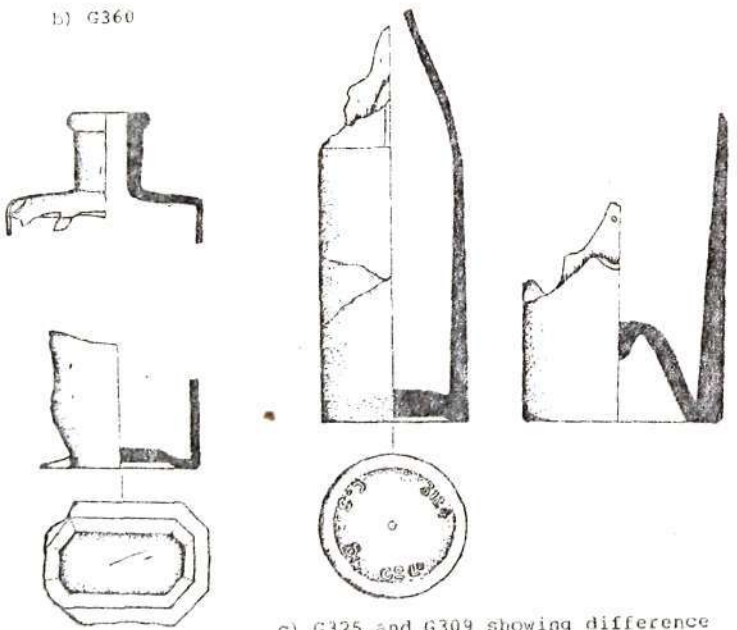
Two similar necks were found, one from the same dump which may have been part of G401 once:

14.(G38)	WRD 21Q(1) brown	2.7-2.1	91.28
15.(G106)	WRA 1A(2) brown, fragment		8.40



Illus. 37 a) G62 and G105, full size.

b) G360



c) G325 and G309 showing difference in kickup, same lettering on base.

Another group of small brown bottles, possibly medicinal, came from the WRD site. These were amber brown in colour, with the maker's name on the base - SOLOMON SOLUTION curved around the edges, and S COX & SONS MELBOURNE in two rows across the middle. Most of the examples have been affected by heat, but one group showed that the bottle was quite small, widemouthed and probably had a screw top.

23. (G105) WRD 16N(9) Base and body fragments, giving complete profile. Low even kickup. base diam. 5.9 cm., straight sides, height 6.9 cm., 13 fragments weigh 126.66g.

24.	(G62)	WRD 17M(1)	base frag.	31.26
25.	(189)	" 24W(1)	part base and body	76.87
26.	(G204)	" 16-22W(1))	part base	41.42
	(G307)	" 24Xd(1))		
27.	(G67)	" 18N(1)	part mouth, heat affected	4.34

Also in the medicinal group were various fragments from Clements Tonic bottles, brown, rectangular:

28. (G360) WRD 15T(1) 24 fragments, some joining, including neck, base and two body fragments with most of CLEMENTS on it. Rectangular base with recessed panel, approx. 7.8 by 5 cm.; neck has neat pplied roll lip, diams. 3 to 1.7 cm. Side semas end just below lip. Weight 244.49g.

29. (G361) WRD 15T(2) 13 more body fragments, one with most of TONIC on it; weight 27.47g.

30. (G373) WRD 14T(1) One body fragment, weight 5.46g.

31. (G140) WRG 10K(1) 5 body fragments, with most of CLEMENT on one. Weight

32. (G123) WPG 10K(1) Possible base fragment, with M or W, 41.91g

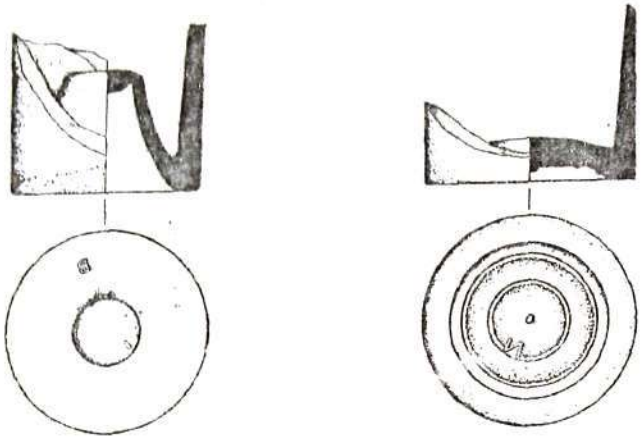
33. " 10J(1) 1 body fragment 6.85

34. " 10J/K (1) 3 body fragments 10.00

Miscellaneous marked bases, with lettering and/or numbering:

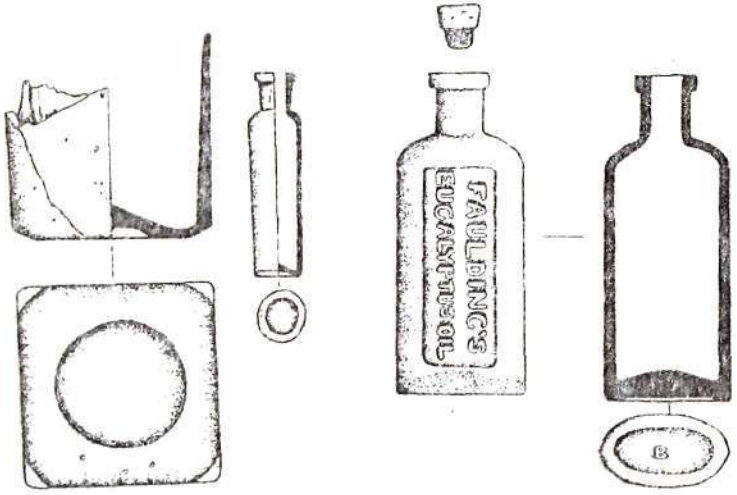
3 with C S & Co Ltd, different numbers, emerald green:

1.	(G309)	WRD 24Xd(1),	with 530	8.3	490.60
2.	(G221)	" 23Yb(1)	with 477	8.2	351.29
3.	(G325)	" 22Yc(1)	with 3124	6.1	378.63



Illus. 38 a) G308 b) C 287

c) G284 b) G102 and G108, medicinal?



The first had high kickups, the last a low kickup.

Another green base had N & Co, with a B on the opposite side of the high kickup:

4. (G308) WRD 24Xd(1) 8.6 384.95

An olive base had very faint lettering, difficult to read:

5. (G283) WRD 24Xa(2) high kickup 8.4 398.05

Two brown bases with low kickups had unusual markings, though the first could be a pulling mark, and the second a fancy pontil:

6. (G287) WRD 24Yb(1) backward Z mark 8.6 246.35

One fragment with just one number:

8. (G20) WRA 11B(2) green, number 4 on kickup 174.55

Most unusual on the site were four square bases, with bevelled corners and a small central circular kickup, very low:

1.	(G284)	WRD	24Xd(2)	green	8.3	393.71
2.	(G191)	"	24W(1)	"	8.5	315.85
3.	(G175)	"	24Xa(1)	"	8.4	307.37
4.	(G323)	"	22Yc(1)	olive, most	8.4	264.83

The clear glass

The aqua and purple tinted glass is included in the type groups.

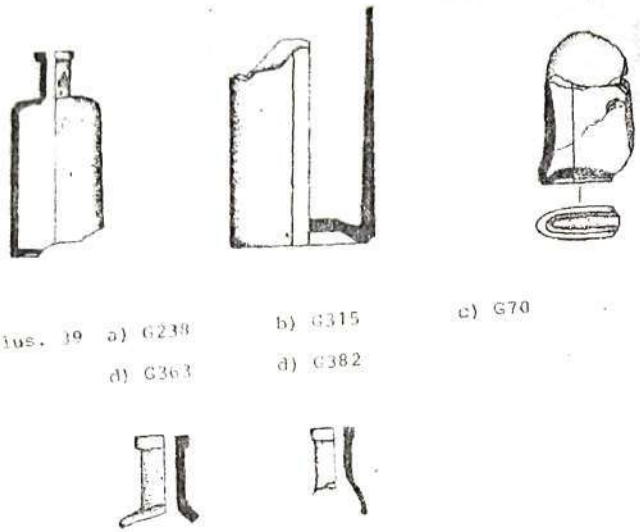
There are few fragments easily identifiable as containing alcohol, most were medicinal or food containers, i.e. for pickles, oil, vinegar etc.

Medicinal

1. (G102) WRA 3A(3) Complete, small round clear bottle, 8 cm. high; applied roll lip diams. 1.8 to 0.9 cm., straight slightly sloping neck to almost square shoulder, body also straight and tapering to base with very low kickup, diam. 1.9 cm. Kickup slightly lopsided, and near base the sides show signs of pulling. Weight 17.59g.

The other supposed medicine bottles have ovoid or rectangular bases, but the necks and lips are the same:

2. (G108) Mine 2 Fauldings Eucalyptus Oil bottle, clear, complete with cork; indented panel on one side has the identifying words. Height 13.1 cm., neck diams. 2.8 to 1.25, base is 5 cm. long, with very low kickup. Weight 149g.



Illus. 39 a) G238 b) G315 c) G70
d) G363 d) G382

e) The complete bottles, G322, 108, 102, 238 and 145.



3. (G238) WRD 24Yb (2) Small, almost whole bottle, clear, with chipped base, and body badly cracked and crazed all over. 8.2cm. high, neck diams. 1.7 to 0.8 cms., base has low kickup, approx. 3.8 cm. long, 1.75 broad. Weight 38.03g.

Similar bases, all aqua tinted:

4.	(G380)	WRD 13S(1)	fragment		3.48
5.	(G365)	" 13T(1)	most	5 x 3	18.44
6.	(G315)	" 22Yc(1)		6 x 3.9	74.29

One purple tinted:

7.	(G70)	WRD 17P(5)	part	ap.3.9 x 1.7	42.90

One pale blue base had a low kickup, but instead of the edge of the base being flat, it was rounded:

8.	(G141)	WRG 10K(1)	part	ap.6.4 x 4.2	23.67

Necks similar to the complete examples, aqua tinted:

9.	(G5)	WRA 2A(Ph2),	with seam line	2.2-1.1	9.61
10.	(G24)	" 11B(P1)	part		11.18
11.	(G65)) (G66))	WRD 18N(2) " 18N(1)	part neck and shoulder		9.76
12.	(G363)	" 14V(1)		2.3-1.3	18.07
13.	(G297)	" 24Xd(1)	seam to shoulder	2.5-1.25	31.44

Purple tinted necks:

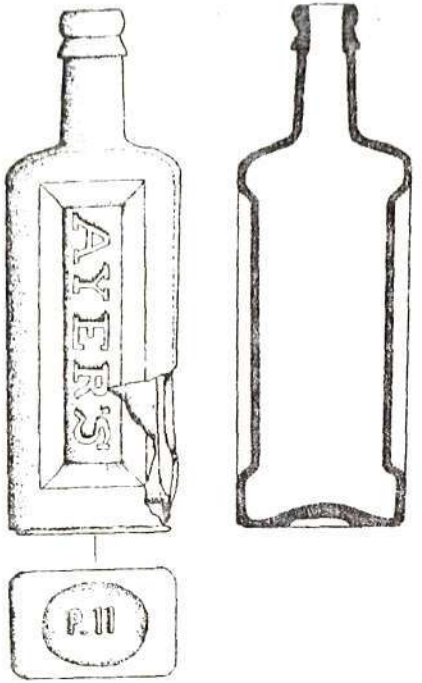
14.	(G8)	WRA 4/5A(1)	fragment		2.00
15.	(G29)	WRD 17P(2)		1.85-0.7	11.46
16.	(G115)	" 23Xd(1)	seam to lip	2.15-1.15	9.80
17.	(G382)	WRH 2A(1)		1.9 -0.9	6.78

The other shape common for medicine bottles was rectangular, some with a rounded body, and varying necks. In this group we have two almost complete examples, one found in Structure D, one from the Rubbish Dump and one partial example, found scattered between structures A,B and C. All examples had lettering on some if not all sides.

1. (G145) WRD 23S(1) Most of a pale blue bottle, rectangualr, with CLARKE'S WORLD FAMED BLOOD MIXTURE on two panels. Height 17.3cm., applied neck 2.1 to 1.5 diam., incomplete base with very low kickup diam. approx, 5.7 by 3.7 Weight 261.74g.

This was the only more or less complete example, but other fragments were found, some from the WRA site, but more from the WRD dump. The colour and lettering made identification easy.

2.	(G2)	WRA 2A(2)	part neck,	2.2-	25.92
3.	(G196)	WRD 24Yd(1)	part base and side		37.58



Illus 40 a) G332 Ayers Sarsparilla bottle.

4. (G231 WRD 24Xa(2) part base and side 28.47

5. (G278) " 24Xd(2) " " " " 152.88
(G202) 16-22W

6. (G1) Surface find, body fragment 49.81

7. (G3) WRA 2A(2) " " 5.79

9. (G215) WRD23Yb(1) fragment, letter N 1.57

10. (G244) " 23Zb(1) 2 " 36.72

11. (G279) " 24Xd(2) 1 ", with E'S 20.91

12. (G280) " 24Xd(2) " 11.73

13. (G332) " 24Xc(2) Most of a very pale aqua tinted rectangular bottle with lettering on all four indented panels AYERS on the front LOWELL MASS U.S.A. on back, and SARS..RILLA and COMPOUND EXT. on the sides. The base, slightly edged around the sides, has a small, central hollow with P.11 across it. Base diam. 6.9 by 4.3 cm., central hollow approx. 3.1 cm. Side seams, one of which seems to continue up into the lip, which is unusual to me, appearing as a double applied lip but very rounded at the mouth; diams. 2.8 to 1.5 cm. Height 21.6cm., weight 356.65g.

James Ayers, druggist began operating in about 1850 and did extremely well, his tonics and other products remaining popular into the early 1900s. Ayers American Almanac for the use of Farmers, Planters, Mechanics and All Families, 1868 said "The certificate of cures by our Compound Extract of Sarsparilla.... show convincingly that it is a specific antidote in nearly if not quite all cases of scrofulous contaminations". It was also advertised, as purifying the blood and curing pimples. Bottles similar to the WRD example were in use from at least 1896. (Information for J. C. Tibbitt op. cit.) There were some other similar fragments; all from the rubbish dump:

14. G218 WRD 2346(1) neck 2.7 - 1.6 83.37

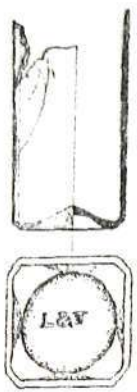
15. G347 " 227d(1) part base 6.9 x 4.3 71.77

16. G170 " 24 Xa(1) base, part sides 7 x 4.4 103.63

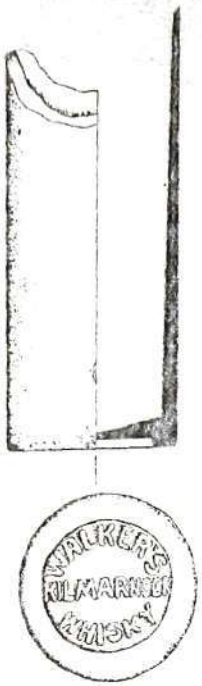
17. G265 " 24Xd(1) frag; with MPOUND EX 28.16

The imcomplete bottle, also aqua tinged, but deeper in colour than the Ayers bottle appears to have contained Indigestion Drops, made by Charles Cross possibly from South Australia. Five fragments from different area joined up, and weighed 79.57g.

18. G51 WRD 18P(1) with lettering ION
G82 " 18P(1) with lettering DS
G58 " 19N(1) with lettering SOUTHA
G59 " 19N(1) with lettering ARLES CROS
G33 " 19P(1) with lettering INDIGEST DROPS
25 30 WATER



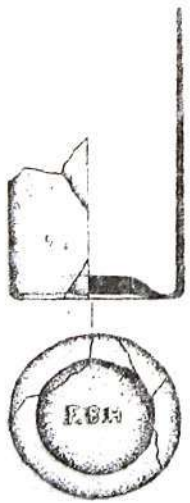
Illus. 41 a) G312



b) G228



c) G235



d) G403

Only one square aqua tinted base was found:

1.(G312) WRD 22Yc(1) base and most body in one piece, square with bevelled corners, central very low "kickup", rather pointed on the inside, with raised letters L & T across it. Diam. 5.2cm, weight 164.19g.

The rest of the bases were round, and quite a few had some lettering or marking on the base or body, some of which was very informative, some not. It is probable that these bottles contained drink, sauces, salad oil, vinegar, or pickles.

One group definitely contained alcohol - three bases were found with WALKER'S WHISKY around the base, and KILMARNOCK across it. The first two examples are clear, the last has a slight aqua tinge (this is the illustrated example):

1.(G100)	WRA	1B(1) part only		45.16
2.(G346)	WRD	22Yd(1)	6.8	272.86
3.(G228)	"	24Xd(1) now 18.5cm high	7.5	486.00

Two bases had lettering on the base, and the manufacturer's name along the side of the body, from base to shoulder; fortunately the first example, illustrated, retained enough of the body to show most of the name, that old favourite LEA & PERRINS; around the base were the letters C B Co:

4.(G235)	WRD	24Ya(1)	235.27
5.(G251)	"	24Xd(2)	71.31

A similar base was inscribed C S & Co, plus the numbers 2419 - very much the same as one of the green bases, G325, illustrated facing page

6.

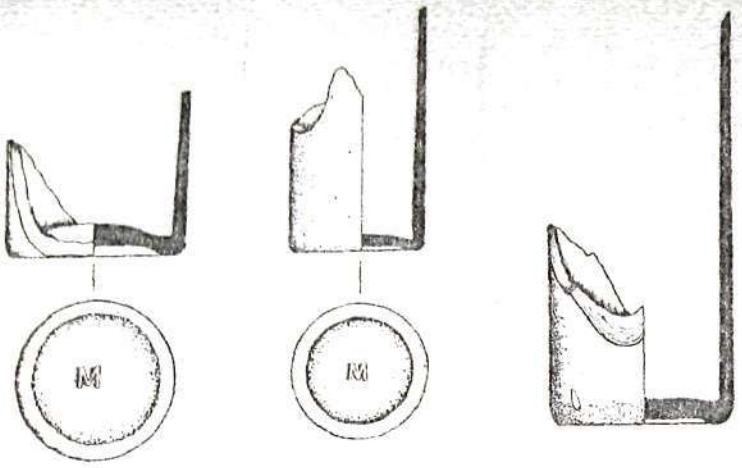
Other marked bases were less informative:

7.(G167) WRD 24Xa(1) with N & Co 1166X 7.8

8.(G403) " 21R(1) with F B H across the middle of a clear base, low kickup, textured glass with a lot of air bubbles 179.20

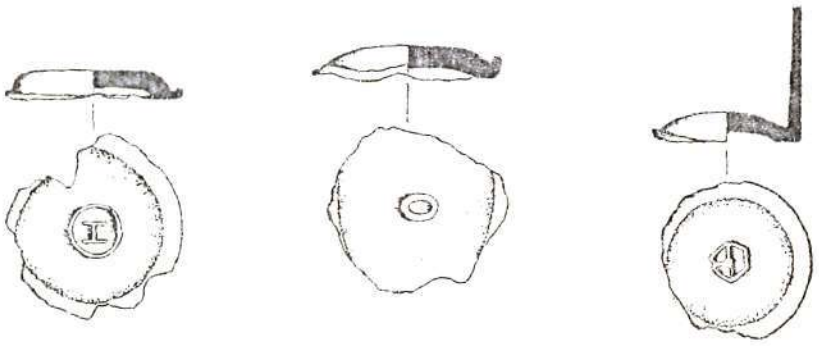
Bases marked M or W came in a variety of sizes:

9.(G253)	WRD	24Xd(2)	aqua, side seams	7.3	121.74
10.(G273)	"	24Xd(2)	clear, " "	5.8	137.20
11.(G350)	"	22Yd(1)	purple, " "	5.8	96.08



Illus. 42 a) G255 b) G273 c) G314

d) G254 e) G256 f) 104



Some of the plain bases were very similar to those marked wtih the M or W:

12. (G319)	WRD	22Yc(1)	purple, side seams	6.0	54.38
13. (G314)	"	22Yc(1)	aqua	7.1	
14. (G168)	"	22Xc(1)	aqua	7.1	
15. (G206)	"	22Za(1)	purple		

Three bases had an encircled H, all aqua:

16. (G131)	WRG	10I(1)			
17. (G254)	WRD	24Xd(2)		7.2	
18. (G295)	"	24Xd(1)			

Two bases had the letter O:

19. (G256)	WRD	24Xd(2)			
20. (G113)	"	23Xd(1)		7.3	85.82

Two fragments combined had an X in the middle:

21. (G34)	WRD	19P(1)		7.4	70.04
(G79)	"	19P(6)			

One base, purple tinged and similar to Nos. 9-15 above, had M10:

22. (G285)	WRD			7.5	

Two other bases contained just a number:

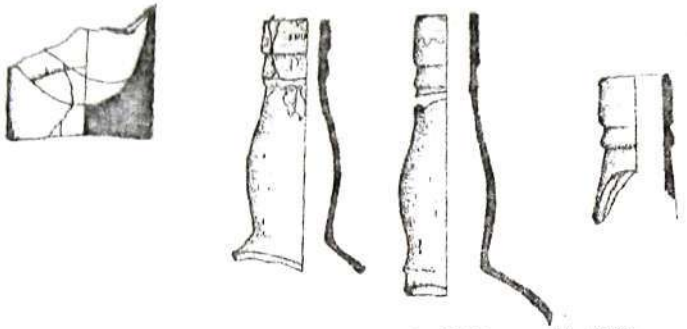
23. (G200)	WRD	16-22W(1)	aqua, with 14	6.8	52.92
24. (G217)	"	23Yb(1)	" 1	7.2	70.17

One contained a possible trademark? as illustrated

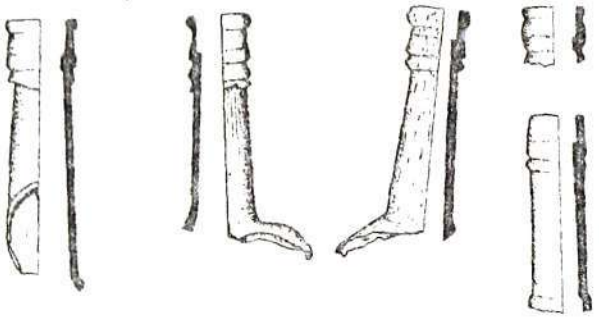
25. (G104)	WRA	1A(2)	aqua, part only		

The rest of the bases were quite plain:

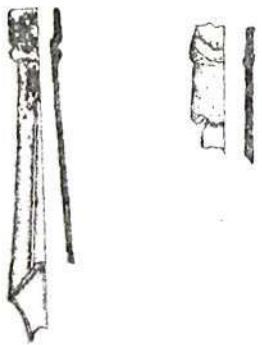
1. (G252)	WRD	24Xd(2)	aqua	7.3	112.04
2. (G293)	"	24Yb(1)	aqua) similar to	7.3	361.85
3. (G199)	"	16-22W(1)	") G131, green	7.2	180.50
4. (G313)	"	22Yc(1)	aqua	7.1	136.59
5. (G169)	"	24Xa(1)	most } similar to	7.2	58.71
6. (G257)	"	24Xd(2)	" } G113, No.20	5.9	31.08
7. (G404)	"		} above		
8. (G112)	"	23Xd(1)		5.9	149.72
9. (G216)	"	23Yb(1)	most	9.0	74.95



Illus 43 a) G274 b) G296 c) G349 d) G220
e) G171 f) G259 g) G243 h) G335 and 186.



i) G316 j) G201



10. (G217)	WRD	23Yb(1)		7.2	70.17
11. (G255)	"	24Xd(2)		5.8	33.32
12. (G315)	"	22Yc(1)	sl. ovoid	6 x 5.8	174.29
13. (G334)	"	24Xc(2)		7.6	117.60
14. (G348)	"		similar to green G157 & 357.	5.55	39.07

A most unusual plain base, purple tinged, with a very thick base, very little kickup with an upward curve on the inside:

15. (G274)	WRD	24Xd(2)	part base & body	6.1	99.09

The neck fragments presumably fit into the food and drink categories, although there is actual evidence for this, apart from the fragments themselves.

The most likely spirit bottle necks have a double applied collar and most have a bulging neck:

1. (G31)	WRD	19P(1)	clear	2.8-2.0	118.05
2. (G296)	"	24Xd(1)	part of lead cap	2.9-2.1	134.90
3. (G349)	"	22Yd(1)	aqua	2.7-2.0	101.21

Two small clear fragments came from WRA 2A(2)

One example appeared to have a staighter neck, although little of it remained: it is similar to the olive G311, p.

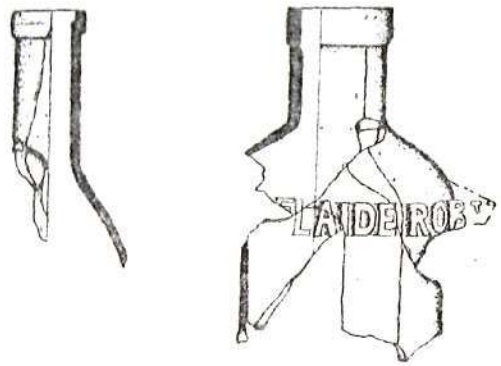
4. (G220)	WRD	23Yb(1)	aqua	2.8-2.0	34.00

Another, with single applied collar, showed signs of a very flared neck:

5. (G61)	WRD	16N(2a)	purple tinge	2.8-2.4	60.66

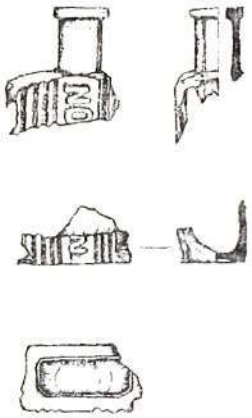
Most probably from salad oil or vinegar bottles were the following necks, mostly quite narrow, with an internal ledge, often with several rings at lip and occasionally lower down the neck, which could be straight or slightly flared:

1. (G171)	WRD	24Xa(1)	aqua	3.0-2.2	55.28
2. (G111)	"	23Xd(1)	" similar	2.9-1.8	45.61
3. (G120)	WRG	10J(1)	" frag. "		7.24
4. (G259)	WRD	24Xd(2)	clear	2.6-1.7	58.55
5. (G28)	"	21P(1)	aqua	2.6-2.2	55.95
6. (G243)	"	23Xb(1)	aqua	2.5-1.8	62.49
7. (G335)	"24Xc(2)		" lip v. rounded	2.5-1.8	17.98
8. (G186)	"	24W(1)	clear	2.3-1.6	
9. (G316)	"	22Yc(1)	aqua	2.2-1.7	47.86
10. (G201)	"	16-22W(1)	aqua, part		24.56
11. (G18)	WRA	11B(2)	clear, part		6.00

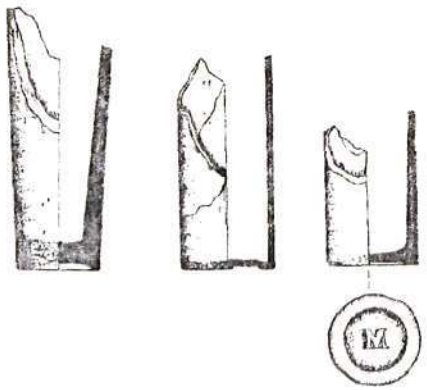


Illus. 44 a) G320 b) G258/239

c) G230/281



d) G173 , 172 and 237.



Also with an internal ledge, but wider mouthed and with a simple applied lip, and possibly tomato sauce bottles:

12.(G320)	WRD	22Yc(1)	purple	3.0-2.1	73.66
13.(G197)	"	24Yd(1)	sl.purple	3.1-1.8	78.97
14.(G304)	"	24Xd(1)	clear	3.2-1.9	48.52
15.(G306)	"	24Xd(1)	purple	3.1-1.9	
16.(G351)	"	22Yd(1)	purple	3.1-2.1	79.55

Apart from slight variations in size and colour(ranging from clear to purple tinged) the above necks were all the same.

One small group had very similar necks, wide mouthed but with less obvious internal ledging; one had some joining body fragments showing that the neck was straight and quite short, and that part of the manufacturer's name appeared around the shoulder, the best example having LAIDE ROBT.

17.(G258)	WRD	24Xd(2)	aqua	4.4-3.6	125.31
(G239)	"	24Yb(2)			
18.(G15)	WRA	10B(F1)	was similar, frag.		13.78

One last group of necks, bases and body fragments were coloured, dark blue and dark emerald green, probably containing medicines.

Three fragments, including neck, base and some body, of very dark blue were probably from a poison bottle; the rectangular body was ridged, and some letters remained.

1.(G230)	WRD	24Xa(2)	most base and some body with letter N on long side		21.91
2.(G281)	"	24Xd(2)	neck and part shoulders, seam to lip, letters ON ending at shoulder	2.5-1.1	19.57

Also dark blue, but plain round bases, very low kickup:

3.(G173)	WRD	24Xa(1)		3.8	131.02
4.(G340)	"	24Xc(2)	slightly lopsided	3.8	58.39

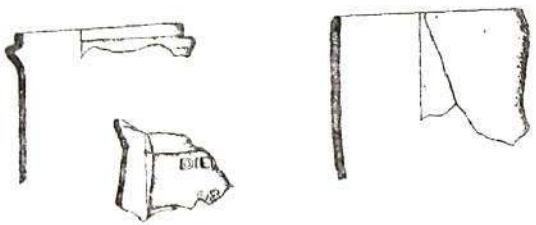
Very similar, but dark emerald green in colour:

5.(G172)	WRD	24Xa(1)	slightly lopsided	3.8	76.83
6.(G237)	"	24Ya(1)	with M or W		43.56



Illus 45 a) G232 b) G242 c) G110

d) G267 e) G211



The necks were all dark blue in colour, and varied in profile:

7.(G282)	WRD	24Xd(2)	rough lip, possibly castor oil bottle	2.0-1.3	12.27
8.(G232)	"	24Xa(2)	similar	1.9-1.3	15.97
9.(G242)	"	24Yb(2)	smooth lip, applied collar and rim, 3 fragments, part only		15.17
10.(G110)	Mine 2		similar	1.9-1.3	45.26

Finally, two groups of clear glass, one the few fragments of lamp glass, found on the D site, and the other the mass of flat glass found over the A site.

The lamp glass:

1.(G367) WRD 15V(2) 9 fragments, of which two made up the lip; heat affected and slightly purple tinged, and major reconstruction was impossible. However, one fragment retained the letters DIE, with parts of two numbers below, probably 9 and 8. 86.82

Lassetter's 1906 Commercial Catalogue contains a Dietz lamp with similar glass. As the fragments were found in the ash pit, this lamp may have been used in the work area, but the metal lamp fragments found so far have been from the kitchen and living area, and are not at all like the Dietz lamp as illustrated.

However, the other lamp glass is far more likely to have fitted the lamp or lamps as found, and comes in two thicknesses:

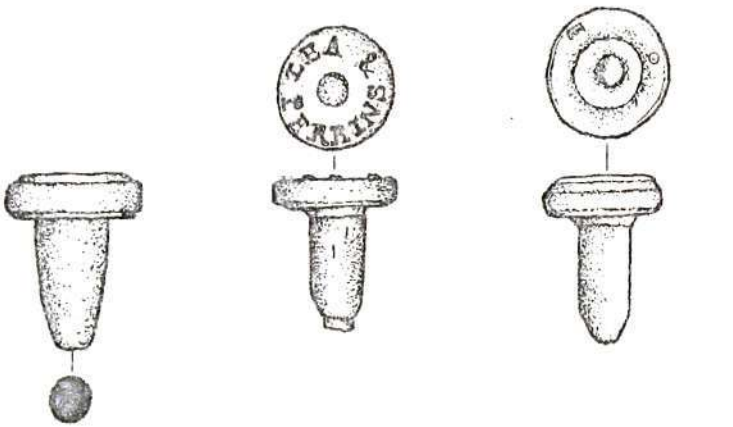
2.(G211)	WRD	23Yb(1)	3 fragments, purple	42.48
3.(G277)	"	24Xd(2)	2 fragments, purple	19.41

Both have a simple slightly curved mouth, no lip.

The clear flat glass, possibly picture glass, was found scattered around the pavement, but especially concentrated in 5A and 5B, at the western end. Most of the fragments were very small, often heavily patinated, and the 164 fragments weighed 160.25g. The glass was only 1.5 to 2 millimetres thick; 61 fragments came from 5A(2) and 53 from 5B(3), 9 each from 5A(1) and 6A(3), 5 from 3C(1), 4 from 2A(3), 3 from 1C(1), 2 from 1B(1), 2C(1) and 4C(2), with 1 fragment coming from 1A(2) and (4), 1B Ph1, 2C(2) and 4C(1).

Three glass stoppers were also found, all made in a mould, and aqua tinted:

1.(G366) WRD 12T(3) with LEA & PERRINS around the top; 3.3cm long, top diameter 2.95cm, weight 14.37g. This may have come from one of the bottles found in the rubbish dump.



Illus 46 a) G118 b)G366 c) G264 full size.

The other two, both plain, came from the rubbish areas:

2(G264) WRD 24Xd(2) 3.2 long, top diameter 2.4cm, weight 14.48g.

3.(G118)WRG 10J(1) 3.6cm long, top diam. 2.8cm, weight 23.94g.

Quite a few of the glass body fragments found had some lettering, or parts of letters, on them. Most of these were too small to decipher, but some contained enough information to provide clues to place of origin or contents.

1.(G6)	WRA	3A(1)	2 clear frags with DES MOINES	2.03g
2.(G98)	WRD	16N(8)	3 fragments, purple tinge, with FAULDINGS MILK EMULSION	81.96
(G103)	"	16N(9)		
3.(G269)	"	24Xd(2)	1 clear, W YORK US	11.58
4.(G364)	"	14V(1)	2 fragments, EUCAL O	6.88

Several fragments indicated Adelaide as the place of origin, and could be from widemouthed sauce bottles, such as G258, which had similar lettering (see page

5.(G321)	WRD	22Yc(1)	1, purple, ROBT ADELAI	103.02
6.(G302)	"	24Xd(1)	1, aqua, ADEL	
7.(G116)	"	23Xd(1)	1, clear, LAIDE	15.56
8.(G72)	"	17P(1)	6, aqua, heat affected, ADE T Co ING	123.55

Most unusual for the site were several fragments of clear glass partly fluted, some fragments with lettering:

9.(G53)	WRD	18Q(3)	6, fluted	53.48
10.(G74)	"	18Q(1)	2, fluted, with OTTL & MAN	8.93
11.(G368)	"	18R(2)	2, fluted	7.33
12.(G372)	"	19R(1)	2, fluted, with POSELT 029 on 1	10.04

The plain body fragments have been listed by area and colour on the following pages.

The glass fragments have been listed by weight and colour as follows:

Area	green	olive	brown	clear	aqua	other
1A(1)	26.31			10.64	34.54	pur. .27
(2)	13.69			.36	26.61	
(4)					12.42	
(5)					.75	
Ph2	33.75					
Ph4				2.07		
1B(1)	3.25	7.09	5.26			
Ph1				.19		
Ph3	1.00					
1C(1)	5.53				3.62	
(2)	1.71			.22	1.64	
(5)	36.75	3.74			6.06	
Ph2					6.00	
Ph5	7.42					
2A(1)					31.00	
(3)				8.66		
2B(2)	.33			.44		
(5)		3.84				
2C(1)	7.73		.71	1.82		p.gr .69
(2)	21.00			1.43		
2D(2)	2.44	.47		1.86		red br .40
Ph1	4.31					
Ph2	3.00	3.95				
2G(1)				5.61		
(2)				10.27		pur. 16.78
3A(2)				1.43	10.75	p.gr 1.96
(3)	2.61			2.19		
Ph4	5.54					dk bl. .28
3C(1)				1.75		
(3)	.42			4.50		p gr. 32.05
Ph1	3.92		8.23			
3D(1)				27.16		
(2)		17.08		7.34		
Ph2	3.13					
3E(1)	60.11	89.09		82.45		
(2)				1.93		
3F(1)		70.34		21.93		
(2)			172.25	10.06	16.54	
(3)			49.80			
(4)	12.72			.72		
(6)			5.48			

Area	green	olive	brown	clear	aqua	other	
4A(3)	4.00			2.33		p gr.	17.67
(4)				1.72		"	6.92
(8)	10.68	6.33		2.08	3.73		
Ph3	1.42						
Ph5	1.38						
4B(2)	.69						
4C(1)	8.12						
(2)	26.41						
(3)			3.35			"	11.80
(5)				.56			
(6)						"	4.45
4D(2)	36.09		2.54	8.20		amber	1.38
Ph1	18.33					p.gr	4.00
5A(1)	16.43						
(2)	1.00		.21				
5B(3)	1.00						
Ph1	22.00						
5C(2)		5.05					
5D(1)	4.20						
(2)	1.00					p.gr.	5.73
(4)		29.87		7.67			
Ph2		36.00					
5E(1)	7.17		3.35				
5/6C(1)				.50			
6C(2)	7.12		19.93	4.70			
10A(1)	4.64						
10B(1)	18.69			2.82	77.12		
(2)	317.53		34.76	130.62		pur.	16.14
(3)	1.70						
11A(1)				2.16			
(2)				2.48			
11B(1)	10.14	1.67		2.29		blue	.52
						purple	.92
(2)	110.76		9.48	2.00		"	.39
(F1)	45.84		2.00	5.17		"	8.52

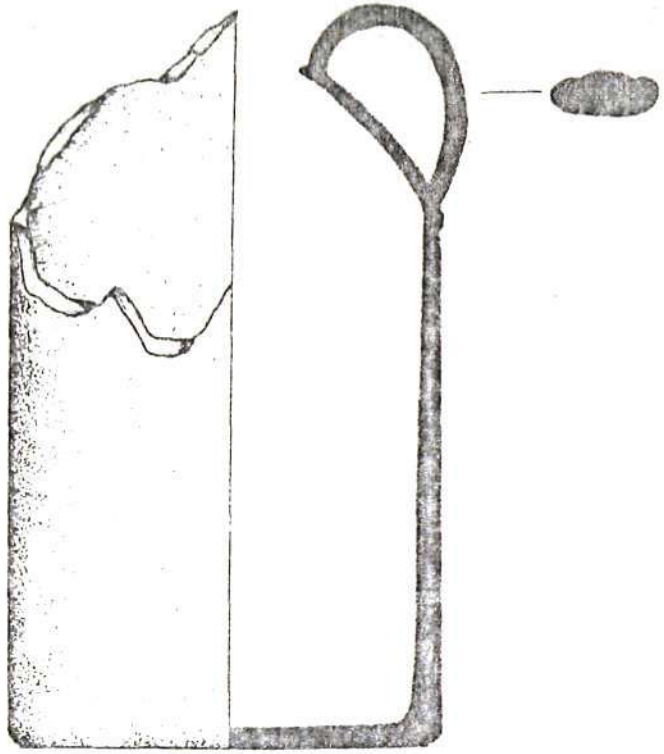
From WRD:

Area	green	olive	brown	clear	aqua	purple	other
19K(1)	14.31						
20K(1)	34.76						
21K(1)	104.21	163.88					
(2)	16.00		16.50				
16L(1)		6.55					
(4)				1.32			
17L(2)				.91			
18L(1)	104.80						
(2)	700.38						
(4)		708.35					
Ph1	6.05	1.54					
19L(1)						36.00	
(4)	73.06						
Ph5							pale bl. 7.38
20L(1)	109.48					16.34	
(2)	1.61			7.93			
21L(1)	662.75					23.02	pale gr. 14.51
(2)	374.18						" 7.69
(3)	65.90						
(4)	104.00						
16M(1a)	344.91			129.00		16.71	
(1b)	54.20					29.54	
(2a)	120.00			65.81			
(2b)	167.88						
17M(1)	166.78						
(2)	64.22		22.25				
(3)	107.31	26.93					
(4)		139.50					" 51.44
(5)							amber 22.11
(7)	17.88						
Ph1						20.77	
18M(1)	96.86				28.37		
(2)	31.85						
19M(1)	226.28						
(2)	4.35				2.62		
20M(1)	1.89			11.35	2.81	69.22	
(2)	1.50				4.44	63.15	
21M(1)		57.68				12.00	
(2)	5.75			22.26			
(4)				2.79	7.79		

Area	green	olive	brown	clear	aqua	purple	other
16N(1a)	222.52					42.39	
(2a)	63.52			8.63		16.71	
(3)	9.08						
(4)		286.36					
(7)	3.19						
(8)	7.15			6.36		25.04	amber 5.42
(9)	8.40			10.06		4.57	
(12)	11.41						" 14.07
(13)	30.79						
17N(1)	78.52					10.53	" 27.51
(2)	31.48					26.51	
(4)	4.78					14.14	
18N(1)	90.00				32.11	5.00	
(2)	9.91				18.00	10.18	
19N(1)	352.76		124.38	26.35	345.72		
(2)	64.92		70.87	17.64	113.61		
(3)	180.44		100.15	29.14	76.89		
(4)	42.73		1.94				
20N(1)	208.98		3.97	70.00	8.88		
(2)	23.28		28.15	57.80	112.43		
(3)	180.70		90.59	31.71	193.93		
(4)	19.09	40.41		6.43	41.35		
(5)					15.52		
16P(1)			191.72	61.08			
(2)			95.89	3.56			
17P(1)					196.75	4.80	
(2)				60.43	186.00	10.98	
(3)						2.22	
(4)					33.08		
(5)					25.32	39.63	
18P(1)		15.76		11.22	109.09	1.28	
(2)	2.30				13.22		
(3)					43.67	.92	
(4)		6.47			12.94		
19P(1)	135.40	61.34		25.36			
(2)			69.78	9.10			
(3)	5.61						
(5)	2.92		30.68	36.51	464.26		
(6)	5.20		125.46		356.87		pale gr.135.10
20P(1)	24.69		4.33				
(2)				.79			dk.bl. 2.20
(5)				7.32			" 6.70
21P(1)	102.53						

Area	green	olive	brown	clear	aqua	purple	other
16Q(1)	772.00			4.51	60.63	.53	
17Q(1)	322.25	419.03		17.31	25.10		
(2)	65.27	71.12		7.16	1.78		
(3)	324.40	137.30		52.05	106.18		
(4)	91.42		33.61	19.79	67.27		pale gr. 161.46
(5)	1123.44		144.61	371.51	246.00	90.12	" 209.00
18Q(1)	4.12			2.02			
(3)				7.29		39.05	" 32.10
19Q(1)	12.47		8.06	.94		6.34	
20Q(1)	42.52		12.58				
(2)	110.64		15.58				" 8.13
(4)	11.10						
Ph2	3.28						
21Q(1)	1704.73		313.68	15.00			
(2)	1459.35	92.44	51.55	48.13		.28	" 90.61
							pale em. 36.14
(3)	10.16		8.49			2.84	navy 9.15
(4)	1318.65	272.74		257.15			" 78.52
17R(1)	384.18		155.08	203.71	59.00		
(2)	495.92		504.74	192.22	34.84		
(4)	15.05		1.50	5.44			
(5)	125.72		3.64	11.61			
(6)				6.00			
(9)					12.60		
(10)					8.88		
18R(1)	86.94						
(2)				8.66			
19R(1)	17.75						
20R(1)	10.21		.92	7.05			em.gr. 2.05
21R(1)	626.89	359.78	343.13	236.68			" 583.55
							pale gr. 174.68
(2)	763.23		36.86	40.65			" 142.61
							navy 1.29
23R(1)				.46			
(2)				.19			
(3)	8.41	2.03					
24R(2)	2.31						
11S(1)	19.00						
13S(1)	37.46				1.25		
15S(1)	623.58	240.35	39.26				
23S(1)							pale gr. 5.33
(3)					13.39		
24S(3)	9.97						" 7.48
25S(1)					4.61		
(3)				.37			

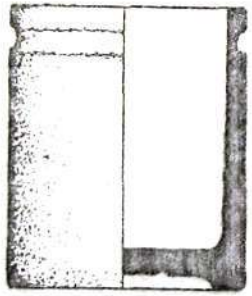
Area	green	olive	brown	clear	aqua	purple	other
12T(1)							pale gr. 5.33
13T(2)				1.43			
14T(1)							em.gr. 65.24
15T(1)	31.77		8.06		18.40		
(2)					7.50		" 4.53
From the WRD rubbish dump:							
16-22W(1)		160.02	3.94	20.47	138.18	32.88	" 458.20 pale gr. 61.69
24W(1)	8.18			9.71	70.72		blue 6.77 em. gr. 77.81
24Xa(1)	62.43	97.92		11.09	150.51		
(2)		19.12		15.49	121.26		" 7.55 pale gr. 42.87
24Xc(1)		6.11			14.60		
(2)	235.30	154.30	11.34		140.37	3.23	" " .
24Xd(1)		112.28			158.56	31.28	" 14.31
(2)	207.60	303.07	63.25	63.25	490.28	37.48	" 21.04
23Xd(1)	50.27	28.18		1.53	55.05		" 7.78
22Yc(1)	85.08	110.62	42.23		495.80		" 20.16
22Yd(1)	426.70	85.15		4.80	228.21		blue 4.30
23Yb(1)	423.88	119.87	238.81	49.49	264.14	47.69	red br. 7.44 pale gr. 11.82
24Ya(1)		92.87	8.22		30.89		lt.blue 1.77
24Yb(1)	40.45	111.26	25.36		93.44	7.59	pale gr. 8.65
(2)	46.32	40.42	10.00	11.03	20.28	9.61	
24Yd(1)	133.37	15.26				9.24	dk.gr. 39.39
22Za(1)					7.52		blue 24.29
23Za(2)		190.59	4.51	69.06	4.87		" 6.73 pale gr. 5.32
From the WRG rubbish scatter:							
10I(1)	28.11		16.20	66.16	144.11	127.00	
10J(1)	120.00		6.85	103.56	181.81	124.61	
10J/K		191.07	10.00	12.12		24.26	
10K(1)	503.92	189.59	65.07	34.39	19.00	13.80	blue 8.13
10L(1)	1557.23	469.64	40.21	281.37	18.00	73.43	navy 1.55 pale gr. 824.61



Illus. 47 a) Almost complete wine? jar.

b) Almost complete ointment jar, P42.





Pottery.

After the mass of metal and glass finds, the pottery is a very slight category, with the majority of articles being clay pipe fragments. The little amount of earthenware was found mostly on the D site.

1. (P18) WRD 20Q(1) Reconstructed almost complete jar, possibly
(P19) " 17Q(2) once holding wine, straight sided with
(P20) " 19Q(1) sloping shoulders marked by two indented
(P21) " 19Q(1) marks. Grey glaze over most of the outside
(P25) " 17Q(1) and inside, with a mottled dark to mid brown
(P26) " 18Q(3) glaze from just below the shoulder to the
(P27) " 18Q(3) top. The few patches of unglazed body show
(P31) " 17R(1) an orangey brown clay. Most of the handle
(P32) " 17Q(5) was found, 3.6cm broad, with slight grooves
(P33) " 17R(2) near each edge, and thumb impression at
(P34) " 18Q(1) shoulder join. Most of the top is missing
(P41) " 17Q(5) and all of the lip. The jar stands 30.4cm
(P56) " 17R(2) high, with a base diameter of 18 cm.
(P61) " 17R(1)
(P68) " 13T(2) The interesting feature about the jar is
(P69) " 14T(1) that not only was it found from surface to
(P70) " 15T(1) bedrock within Structure B, which would
(P71) " 13S(1) indicate that all the interior deposits were laid down very quickly, but that some of the pieces had spread quite some distance to Structure G. This may be explained by surface fragments being casually moved by visitors or later users of the site.

2. (P42) WRD 17Q(5) Reconstructed small ointment jar, with lid, almost complete. Straight sided, with fitting lid with slight indentation around outer edge. 6.5cm high with the lid, diameter 5 cm. Off white colour.

Two different pottery types were found around Structure C, but it was not possible to reconstruct them. The pieces were much finer and harder than the wine or ointment jars.

3. (P22) WRD 18M(1) 51 fragments, white glazed with mottled grey and brown slightly gilded pattern on the outside.
(P23) " 18M(2) 48 fragments
(P28) " 18L(1) 1 "
(P29) " 17L(1) 1, possible base fragment
(P30) " 17M(1) 5, 2 possible base fragments
(P35) " 17M(2) 2 fragments

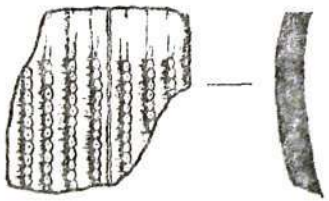


Illus 48 a) P65 complete bowl



b) Almost complete stem, P57

c) Unusual bowl pattern, P75.



4. (P37) WRD 18N(1) 1 base fragment, white porcelain.
   (P38) " 17P(1) 1 fragment
   (P39) " 19M(1) 1 "
   (P40) " 20M(2) 1 "
   (P43) " 16N(13) 5, " heat affected
   (P60) " 21K(1) 1 "
   (P76) " 17N(4) 1 "

Some small fragments of a thick white glazed earthenware were found in the rubbish dump:

5. (P66) WRD 24W(1) 2 fragments, possibly from a plate.

6. (P67) " 23Yb(1) small rolled rim fragment.

The Clay Pipes

The finds were very fragmentary for the most part. The only complete bowl was found near the 1979 camp site, but is included as the best example of the common bowl pattern:

1. (P65) WRC Complete bowl, with basket weave pattern enclosed in stylised rope patterns, one just below the mouth, and one close to the base, just above the stem join. Below this lower rope pattern the central seam is hidden by a slight ridge, decorated with circles; on the bowl is a simple stylised leaf and flower pattern, presumably extending onto the stem.

Other fragments showing the same basket weave pattern:

2. (P59) WRD 21K(1) small fragment

3. (P62) " 24R(2) " "

4. (P49) " 24S(1) " from back of the bowl.

A different pattern appeared on one fragment:

5. (P75) WRD 12S(3) had rows of raised circles.

Of the stem fragments large enough to show a maker's name, most pieces were stamped S McLARDY, with MANCHESTER on the other side. McLardy made clay pipes from 1860 to 1930, which is not very useful in dating finds more closely. The bigger stems fragments show a stylised leaf pattern at the bowl end, very possibly an extension of the pattern on the basket weave bowls.

6. (P57) WRD 23R(1) The most complete stem fragment, in two pieces, with the name stamp quite clear, but no mouthpiece.

Other McLardy stems, or parts thereof:

7.(P24) WRD 19P(1) incomplete stem and stamp.

8.(P63) WRD 24R(2) part only of stem and stamp.

One stem had another name stamped on it:

9.(P50) WRD 24R(1) Much thicker and rougher stem, stamped WALDIE on one side, and as almost obliter- stamp on the other.

The rest of the fragments are so small that they have no signs of a stamp, although some are from the mouthpiece end.

10.(P15) WRA 2A(2) part mouthpiece only.

11.(P16) " 5A(1) mouthpiece and part stem.

12.(P45) " 3CPh1 diamond shaped mouthpiece (squashed?)

13.(P46) " 2B(5) blackened, with mouthpiece.

14.(P51) WRD 24R(1) mouthpiece, part stem.

15.(P52) " 24R(1) " " "

16.(P53) WRA 5A(1) " " "

17.(P58) WRD 23R(1) " " "

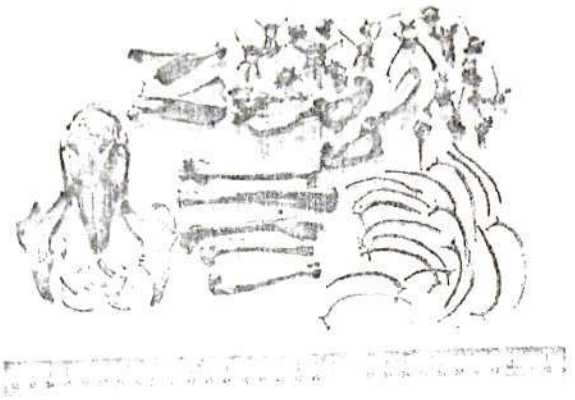
The remaining fragments were quite plain, small lengths of stem:

18.(P1) WRA 6C(2) 1 small stem fragment

19. (P17) " 5/6C(2) " " "

20.(P54) " 5DPh2 " " "

21.(P74) WRD 15V(2) " " "



(Illus 50a) Rabbit skeleton



b) B5, ox rib fragment



c) B8, worked bone?

The Bone.

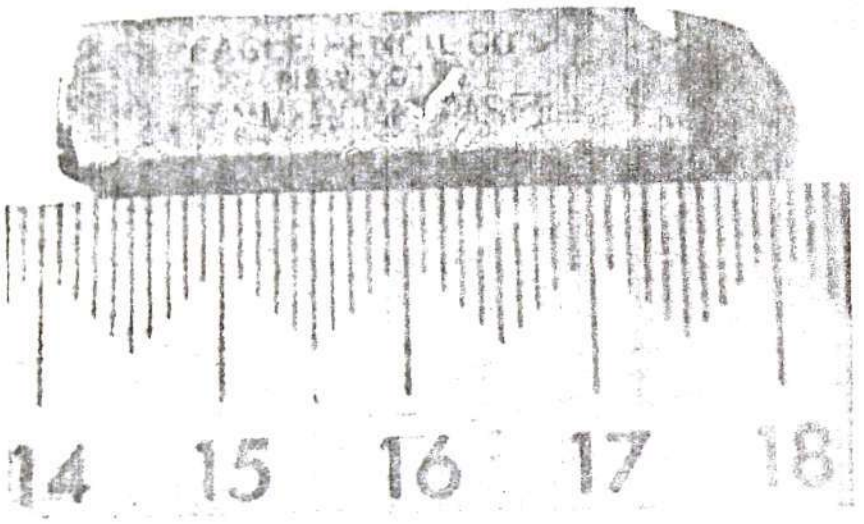
The bone was very fragmentary for the most part, too small for positive identification. Most of it appeared to be from animals such as sheep or goats, with the documentary evidence supporting goats; many of the fragments had been cut. There were some variations:

1. (B1) WRA 3F(F2) Complete skeleton from within the Wind Tunnel, of a rabbit. Presumably the animal crept into the tunnel when wounded or ill, and died there - just where we put a section through the tunnel to check on its construction.
2. (B3) WRA 1C(2) Large rib fragment, from ox - probably part of a waggon team.
3. (B6) WRA 2B(3) 1 large and 2 small fragments from ox rib.
4. (B7) WRA 10B(2) 1 large and 4 medium fragments of bone, the large one certainly from an ox rib.
5. (B8) WRD 17Q(5) Small bone fragment, cut and shaped, one end presumably broken leaving half a hole in the middle of the fragment. The reverse was almost flat, the obverse has sloping shoulders to flat top. Part of a necklace?, some sort of decoration?

The rest of the fragments were small, often burnt and/or cut:

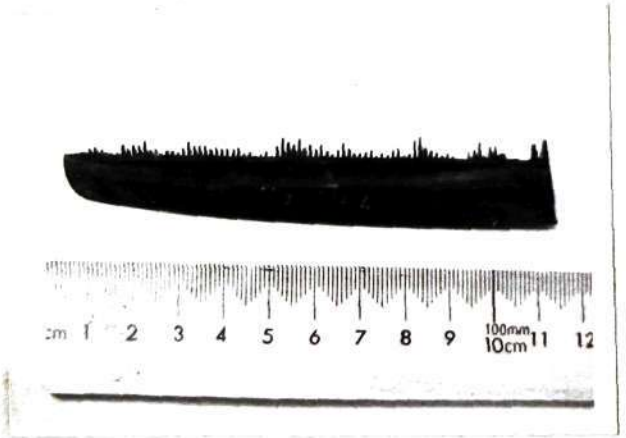
6. (B2) WRA 1C(5) 6 small fragments, possibly flaked from a larger bone.
7. " 3C(Ph1 Tiny fragment of bone.
8. " 3A(3) Tiny fragment of curved bone.
9. WRD 19Q(4) Two small fragments.
10. " 18L(1) Tiny fragment, burnt.
11. " 16N(13) Curved, burnt fragment.
12. " 19P(5) Two burnt fragments, possibly from rib.
13. " 17Q(3) Small curved burnt fragment, possibly rib.
14. " 16N(12) Tiny curved burnt fragment.
15. WRA 4A(4) Tiny, slightly burnt fragment.
16. " 4A(8) 5 small fragments.
17. WRD 21MPh1 Small bone fragment.
18. " 21M(4) 6 small bone slivers, dark brown, very smooth. 2 small fragments, lighter brown, less smooth.
19. " 20L(4) Tiny burnt fragment, possibly from rib.
20. " 18L(2) Tiny fragment.

21.	WRD	23S(3)	2 joining small rib? fragments 2 small curved fragments, 1 tiny fragment 1 medium burnt fragment.
22.	"	23S(2)	2 small bone fragments.
23.	"	24S(1)	1 small, 1 tiny fragment.
24.	"	24R(1)	Tiny, curved, burnt fragment.
25.	"	25S(4)	Tiny fragment, burnt black.
26.	"	25S(3)	2 small fargments, 1 from rib.
27.	"	23R(3)	4 tiny fragments, 3 being almost flat slivers.
28.	"	23R(1)	Small, slightly burnt fragment.
29.	"	24R(2)	6 small fragments, 1 curved, 1 from rib.
30.	"	24R(3)	4 small whitish fragments.
31.	"	24S(3)	7 small fragments, 3 from rib.
32.	"	12TPh1	3 small bone fragments, 1 blackened.
33.	"	12T(3)	2 joining and 2 other blackened fragments.
34.	"	12S(8)	1 slightly blackened vertebra.
35.	"	17R(4)	Tiny part blackened fragment.
36.	"	15V(2)	1 slightly blackened vertebra 2 medium fragments, cut 3 medium fragments, 2 from rib 7 small fragments, white 1 small brown fragment, possibly from rib 49 other small and tiny fragments.
37.	"	24Y(b)2	1 medium and 1 small brown bone fragments.
38.	"	12S(3)	1 medium and 1 small fragment.
39.	"	12T(2)	6 brown fragments, at least 2 were cut. 6 burnt grey-brown fragments 1 tiny white fragment, possibly cut.
40.	"	11T(2)	2 brown bone fragments, 1 cut 5 small fragments, burnt.
41.	"	11S(2)	12 grey-brown burnt fragments, 8 from rib 12 small grey-brown fragments, 2 cut 2 small white fragments.



Illus. 51 a: Pencil eraser.

b) Remains of comb.



Other material:

This is mostly rubber, leather or cork.

1. WRA 5B(3) Pencil eraser, basically rectangular in shape, with one pointed end, possibly unused. On one side the label remains in quite good condition, with EAGLE PENCIL CO'S COMMERCIAL ERASER NEW YORK. It is 4cm long, .9cm high, .8cm broad.

The Eagle Pencil Company's pen nibs appeared in the 1897 Sears Roebuck Mail Order Catalogue, but I have not been able to find any reference to this shaped eraser, the rather thin round ones seem to have been popular then.

Leather fragments, mostly blackened triangles now very twisted, and probably heel leather, were quite common, as were corks, but most were found in the rubbish dump:

	Leather	Cork
WRA 1A(4)	1	
" 2APh2		1(with bottle, G5)
" 3E(1)	1	
" 3D(1)		1
" 2C(2)	1	
" 11B(2)	4	1
WRD 23S(2)		1 frag.
(3)		1 "
" 24Xa(2)	2	1
" 24Xc(2)	3	
" 24Xd(2)	8	3
" 22Yc(1)		2
" 22Yd(1)		1
" 23Yb(1)	1	
" 23Za(2)		1

2. WRA 4C(6) Part of a comb, possibly tortoiseshell, the fine toothed end, with very little of the teeth remaining. The top is slightly ovoid in profile, coming in to a rounded hollow just above the teeth. 11 cm. long.

3. WRA 1B Ph1 Small, slightly curved fragment of pipe stem? not clay, dark reddish colour, mottled, with hole through the middle which at one broken end has five small ridges - possibly where stem screwed into wooden bowl?

4. WRA 4A(4) Dark brown pipe stem with mouthpiece, flattened at end, but becoming rounded at the broken end, which like the above fragment, is ridged to hold a screw in attachment. This stem is very light, possibly made of Vulcanite or similar material, which was not used for pipe stems until the First World War and after. The identification is not yet definite, but as this came from under the paving stones in 4A, a late date is not wanted.

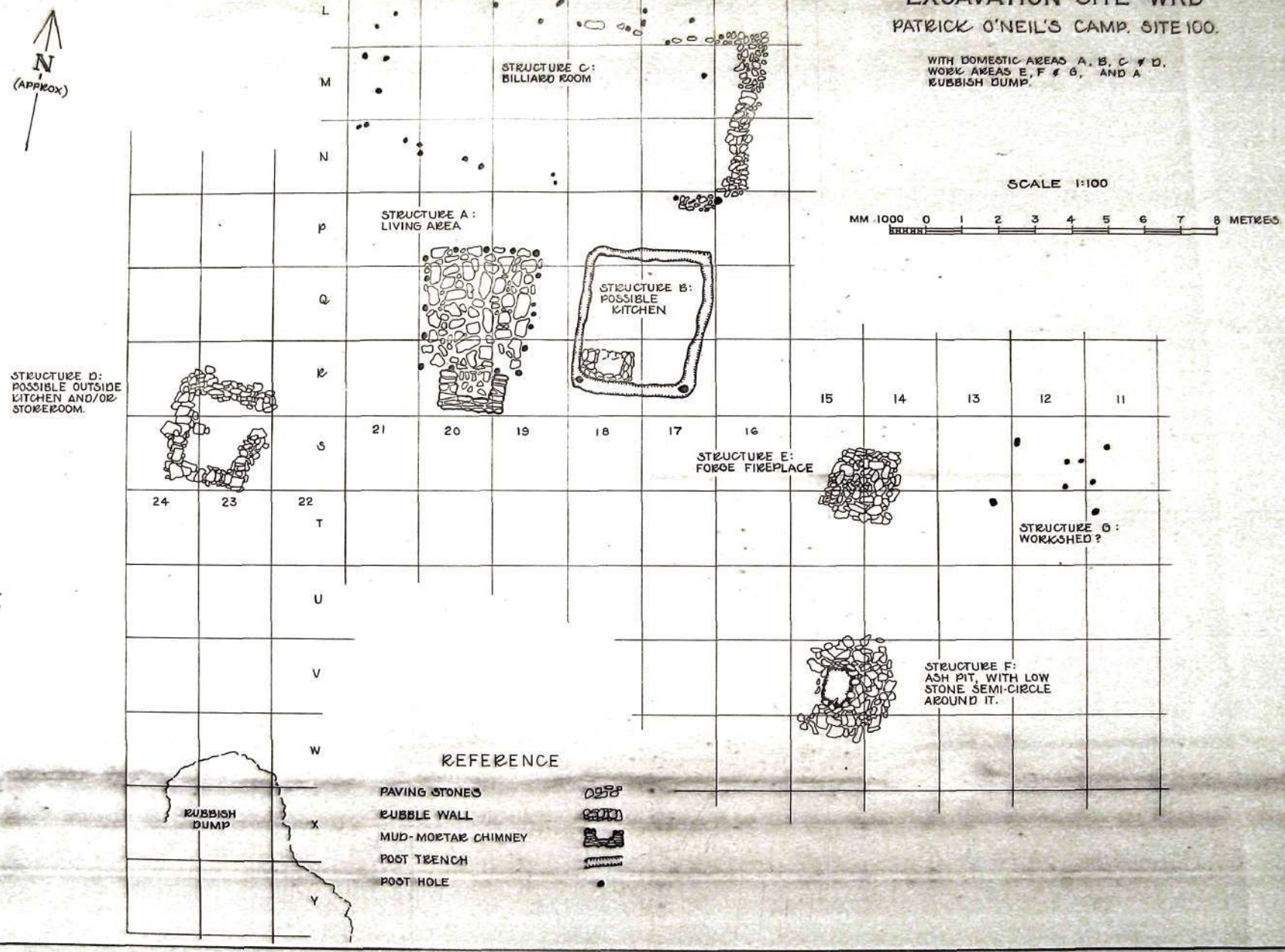
Very few examples of micah (the finished product) were found. A small piece came from WRA 6C Posthole 2, approx. 7 by 5cm, and a small "book" came from inside Structure D, of several leaves, some 25 cm square.

5. WRD scattered over the whole site, some 85 pieces of slate, which probably made up into a small pool table. Several pieces were curved, some for corner and some for side pockets, with holes for counter-sunk screws, and in one case the screw itself. Associated with the slate, and of a similar thickness, were approximately the same amount of a heavy manufactured material, also showing curves for pockets. My researches on billiard tables of that time are not yet complete, but I think the other material must have been associated with the table in some way.

EXCAVATION SITE WRD

PATRICK O'NEIL'S CAMP. SITE 100.

WITH DOMESTIC AREAS A, B, C & D.
WORK AREAS E, F & G, AND A
RUBBISH DUMP.



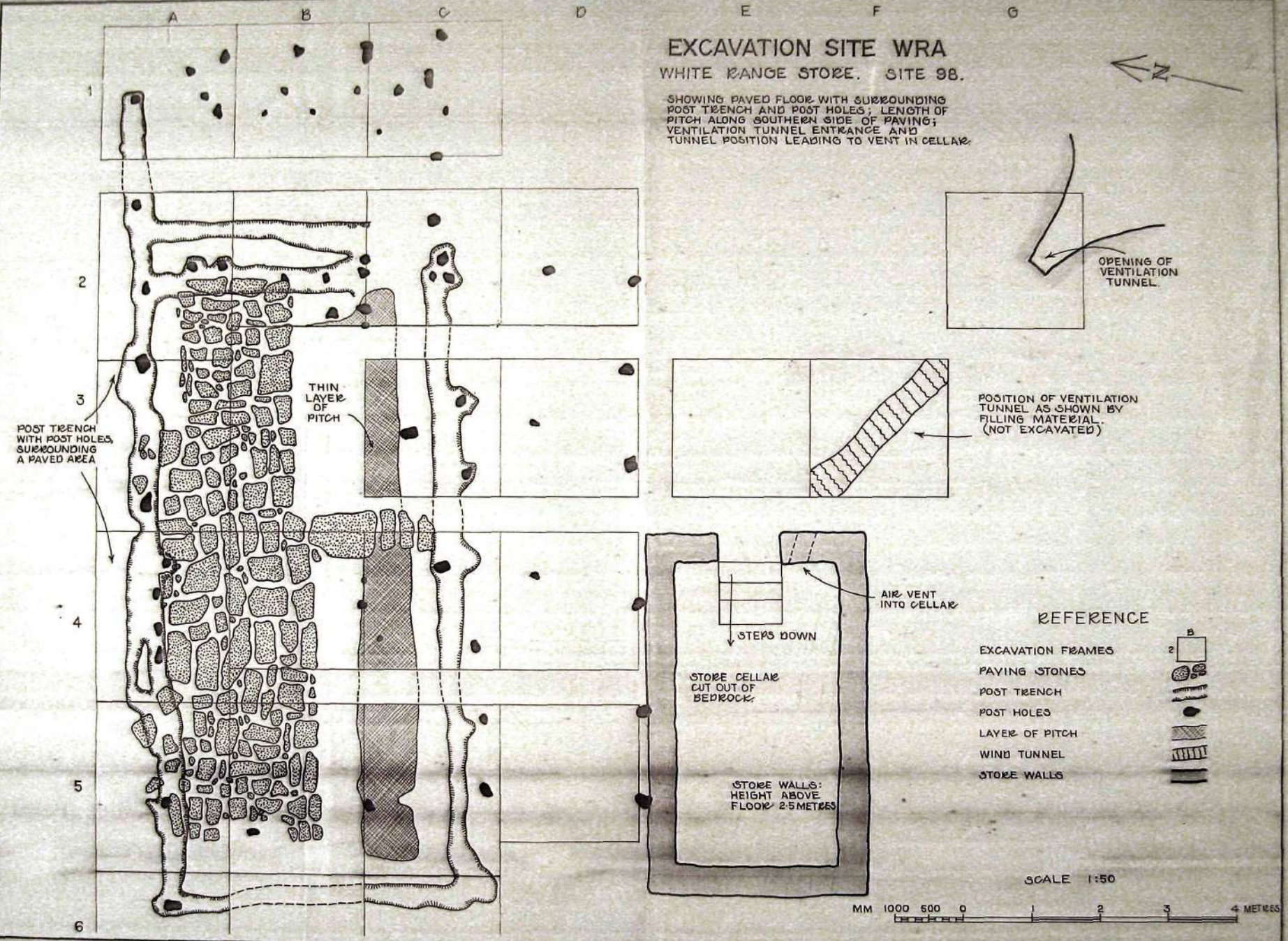
SCALE 1:100

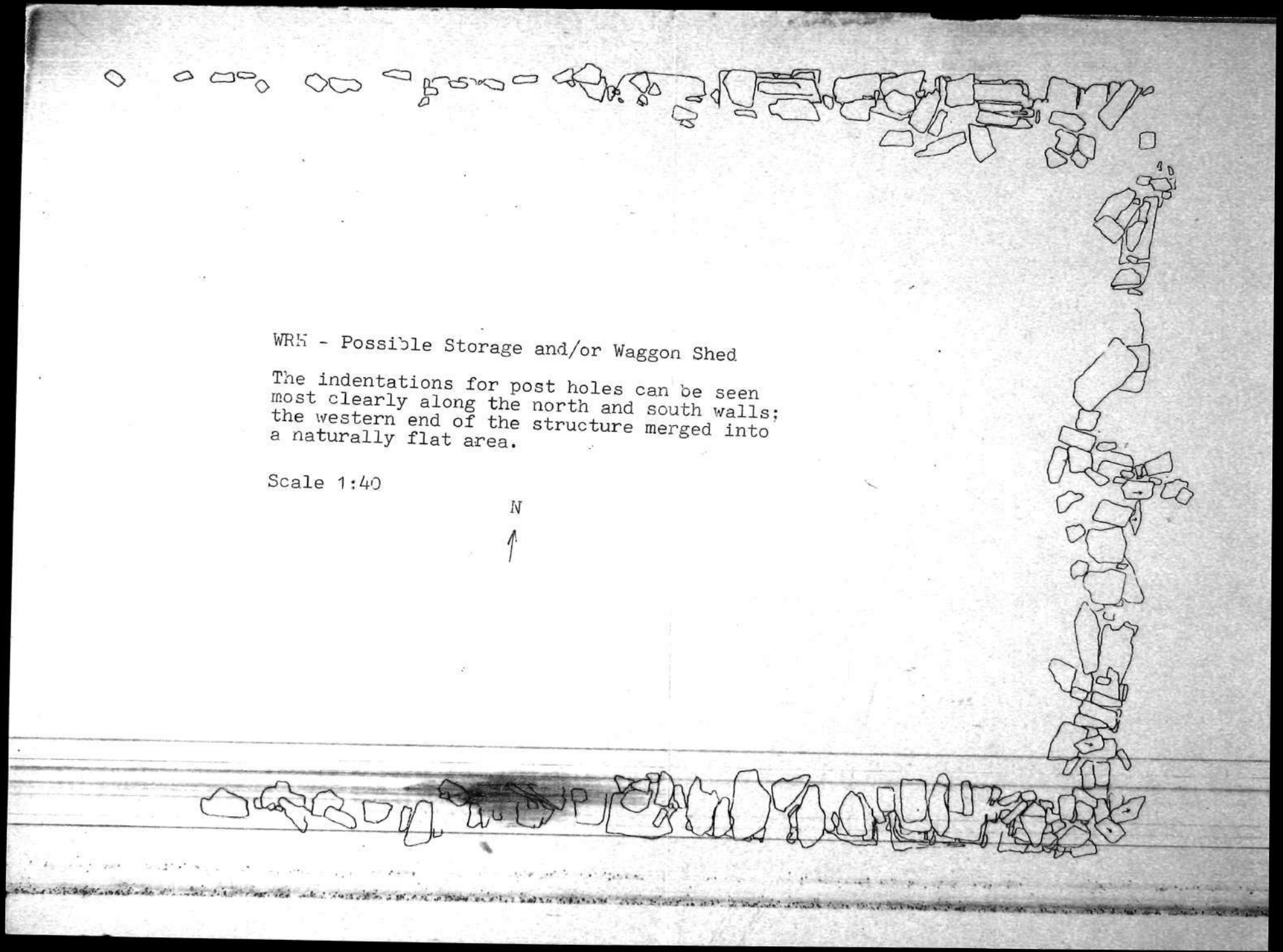
MM 1000 0 1 2 3 4 5 6 7 8 METRES

EXCAVATION SITE WRA

WHITE RANGE STORE. SITE 98.

SHOWING PAVED FLOOR WITH SURROUNDING POST TRENCH AND POST HOLES; LENGTH OF PITCH ALONG SOUTHERN SIDE OF PAVING; VENTILATION TUNNEL ENTRANCE AND TUNNEL POSITION LEADING TO VENT IN CELLAR.



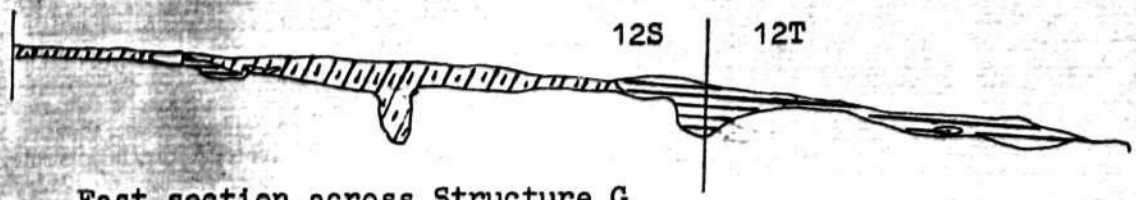


WR5 - Possible Storage and/or Waggon Shed

The indentations for post holes can be seen most clearly along the north and south walls; the western end of the structure merged into a naturally flat area.

Scale 1:40

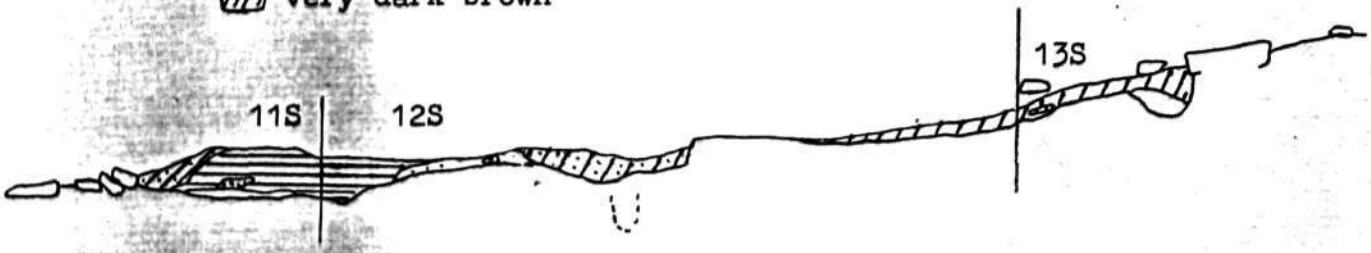
N



East section across Structure G

Scale 1:20

black
grey
very dark brown



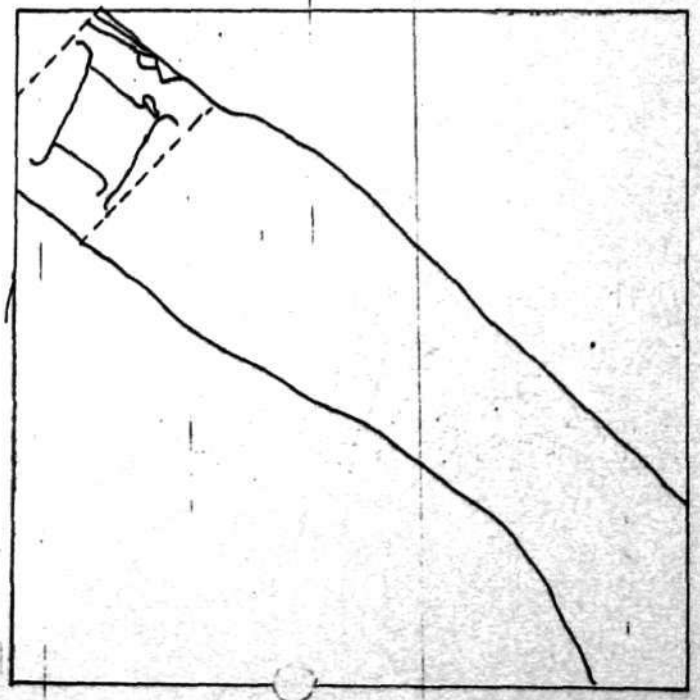
South section across Structure G

soft black
orange
grey/brown
brown
posthole not quite along the section



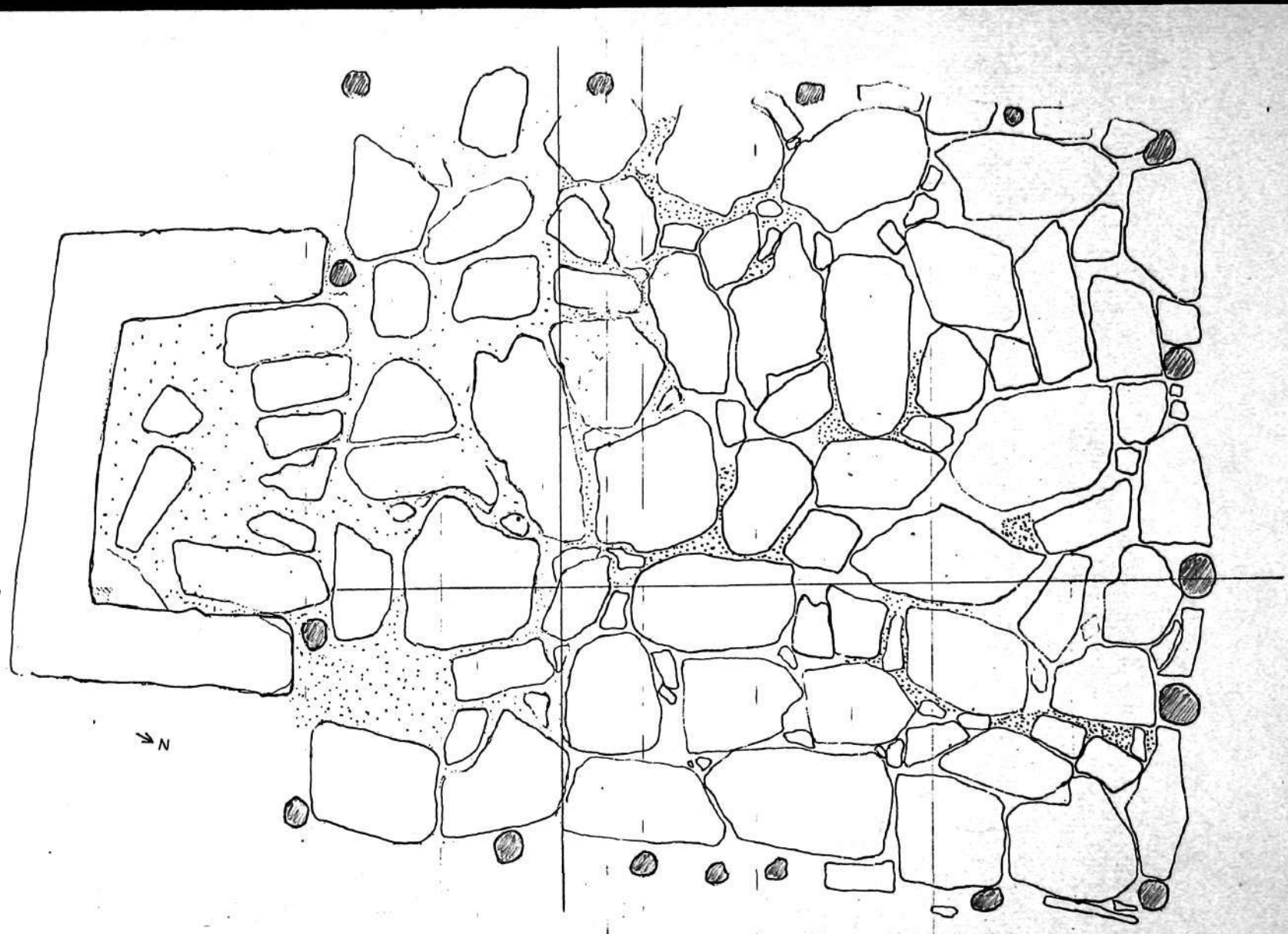
2G

The Wind Tunnel - entrance in 2G,
line of tunnel in 3F. Store to E.

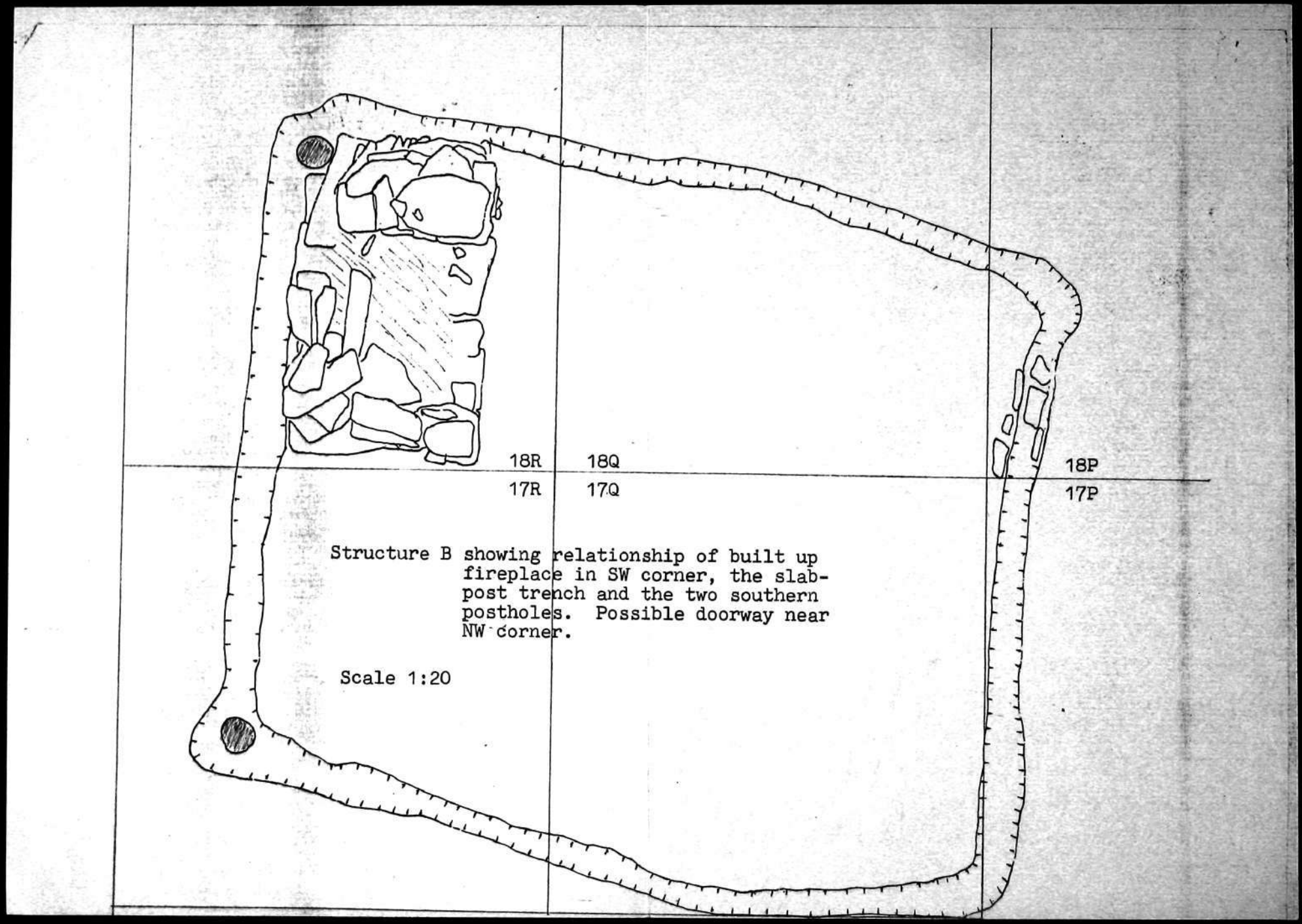


3F

N

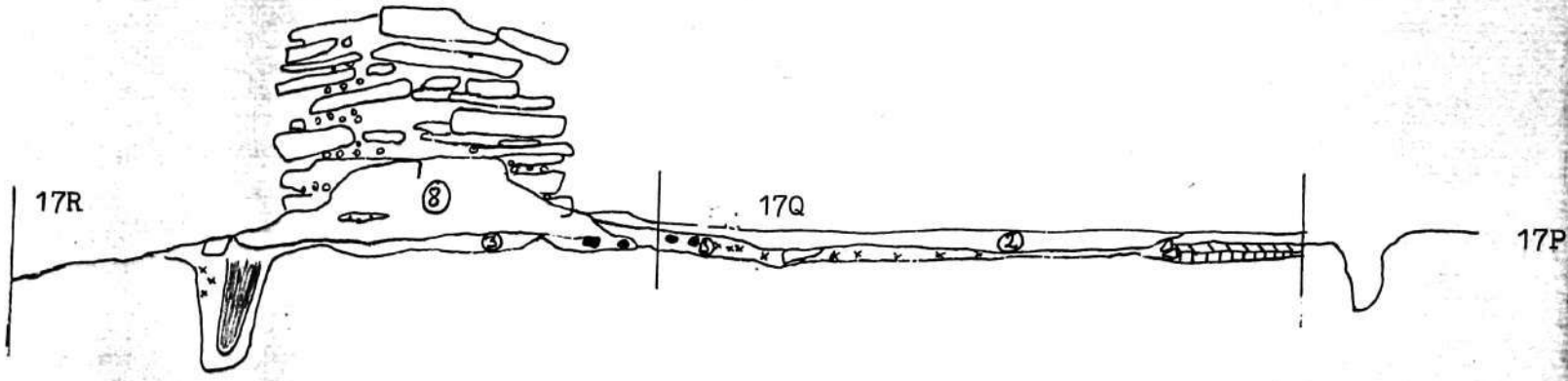


Structure B, as completed with most postholes set into paved floor. 1:20



Structure B showing relationship of built up fireplace in SW corner, the slab-post trench and the two southern postholes. Possible doorway near NW corner.

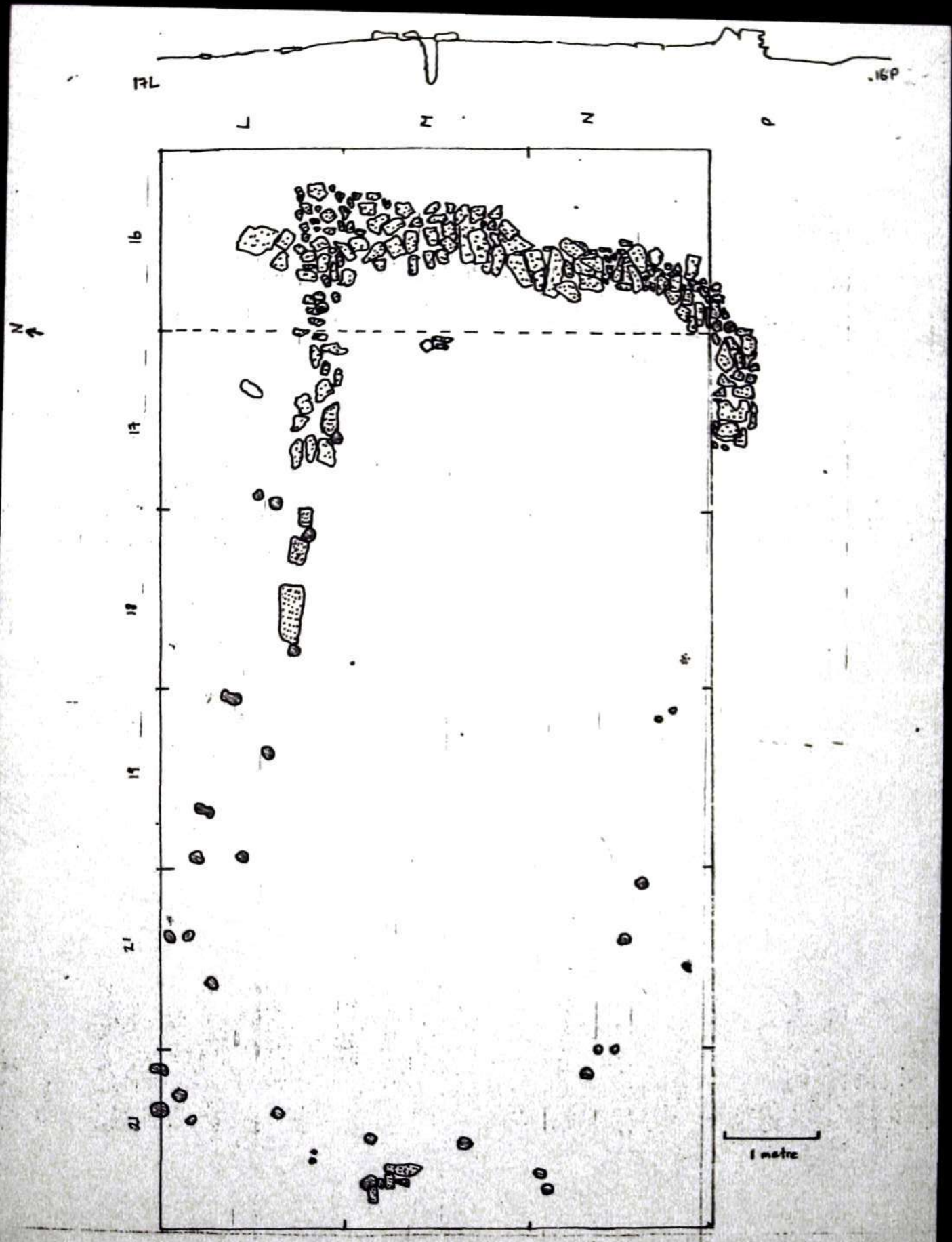
Scale 1:20



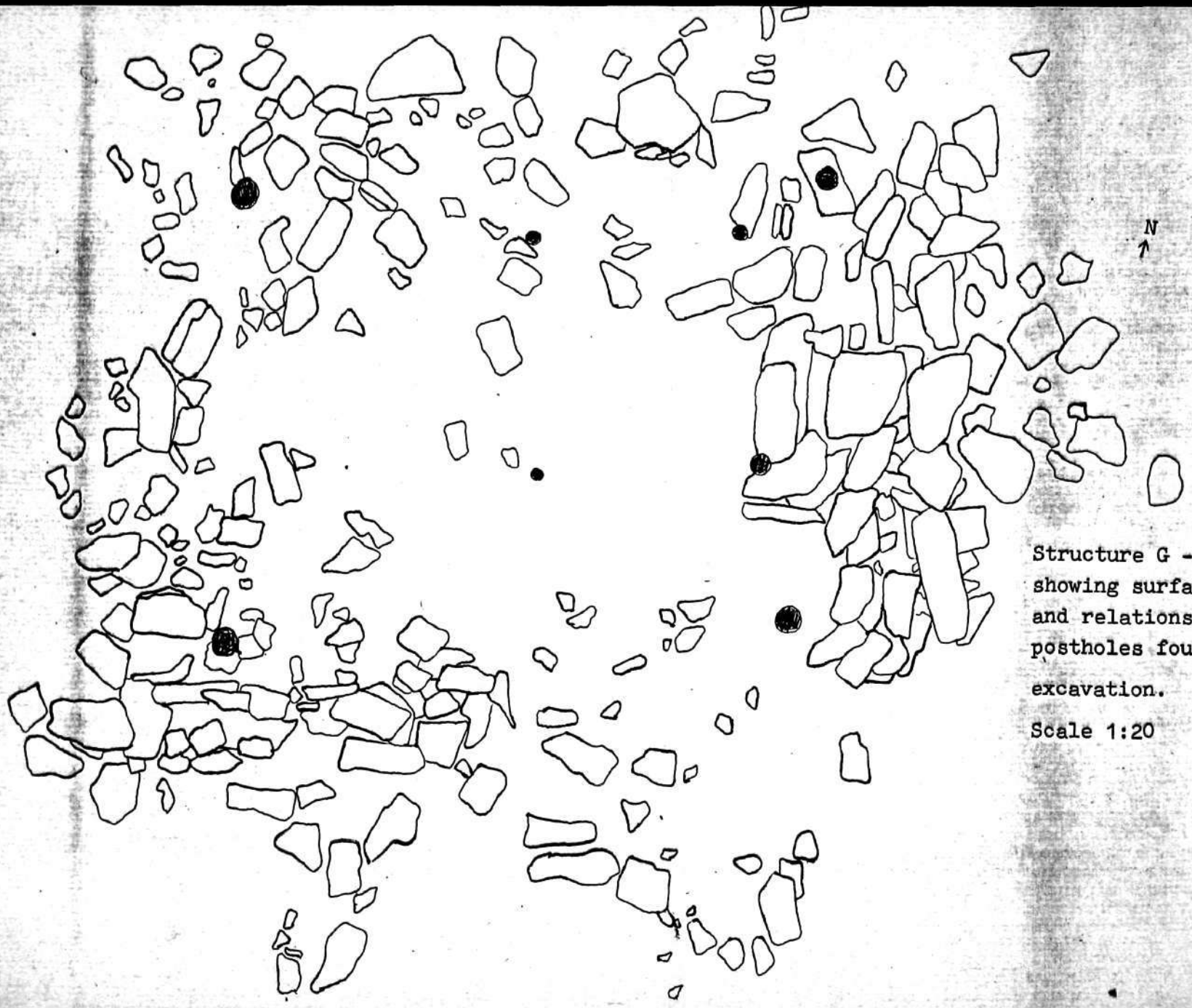
West section across the middle of Structure B showing height of fireplace and the slab post trench in the south and the north.

Scale 1:20

(2) light brown
(3) dark brown with some charcoal
orange clay
wood staining
charcoal
pale grey
orangey brown
hard packed material
(8) brown (mortar?)



Plan of Structure C, as completed. The eastern section: from 17L,M,N and P shows Posthole 1 in 17m, the edge of the stone wall in 17P, and the flatness of the "interior" of thestructure

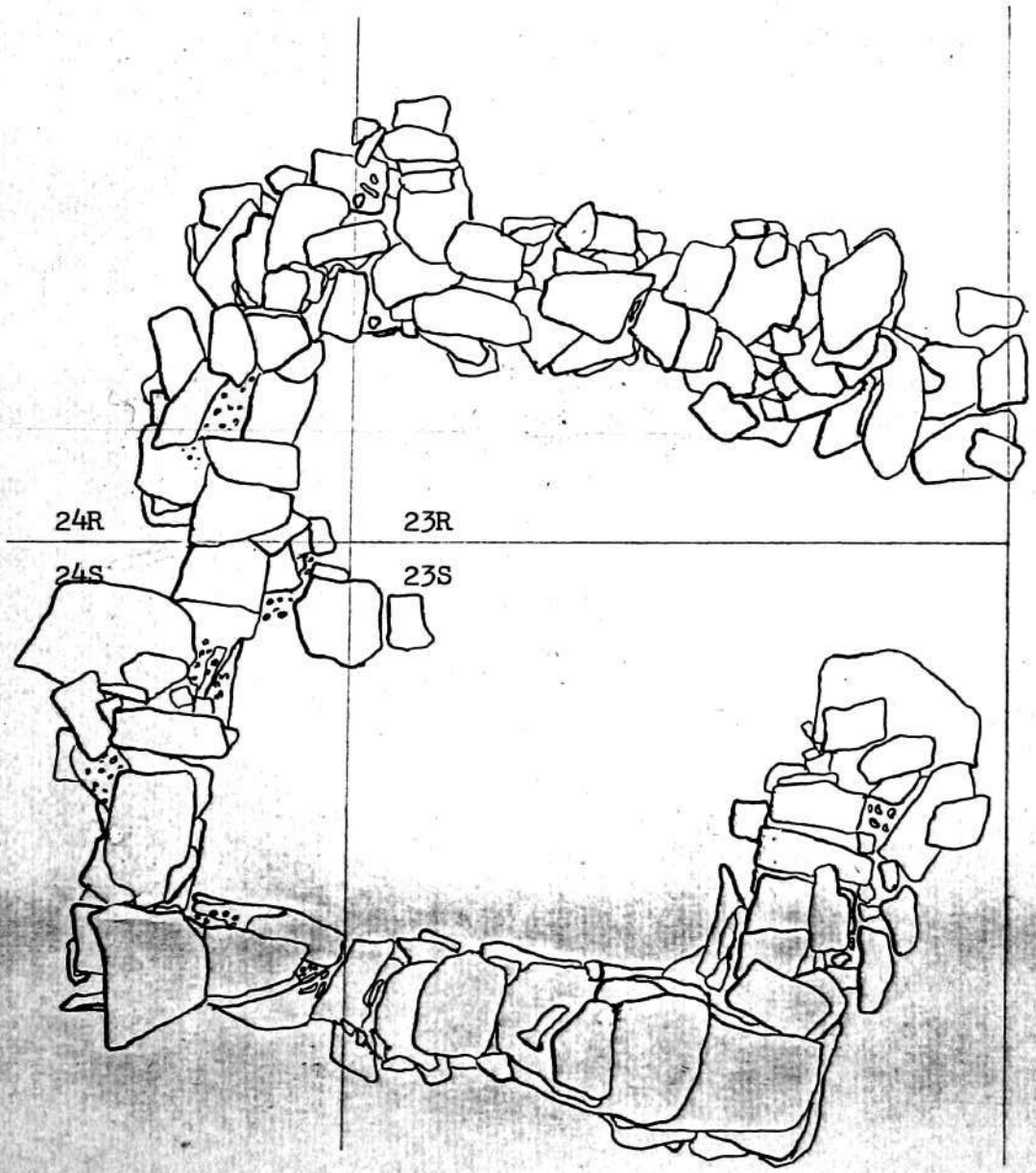


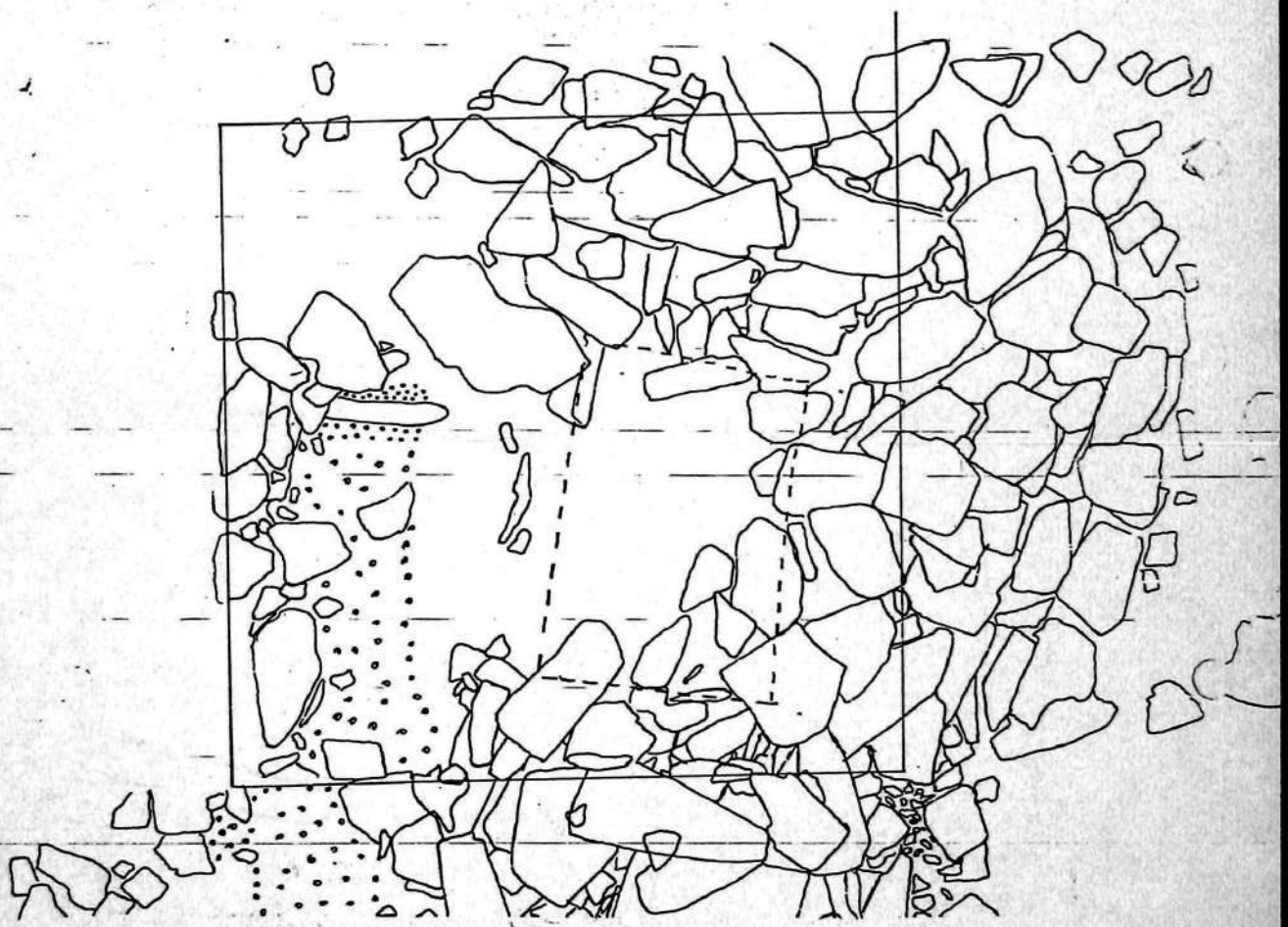
Structure G - plan showing surface stones and relationship to postholes found by excavation.

Scale 1:20

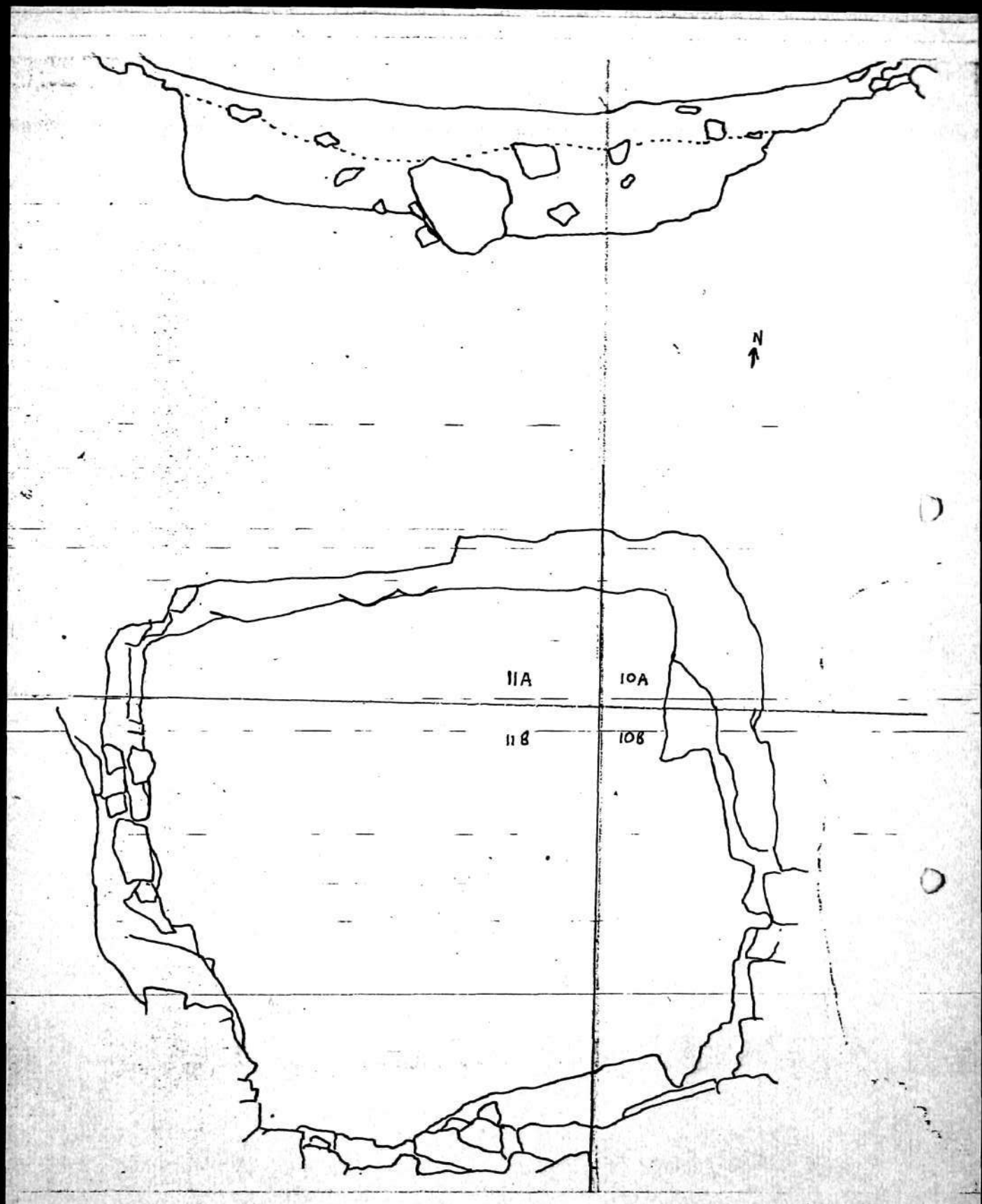
Plan of stone walls of Structure D

Scale 1:20

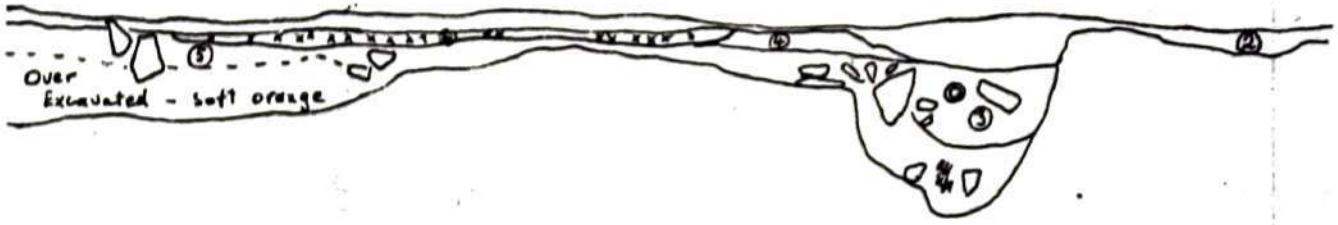




Structure F, mostly in Square 15V, showing surface build up of stones, ash pit shown as dotted line. 1:20

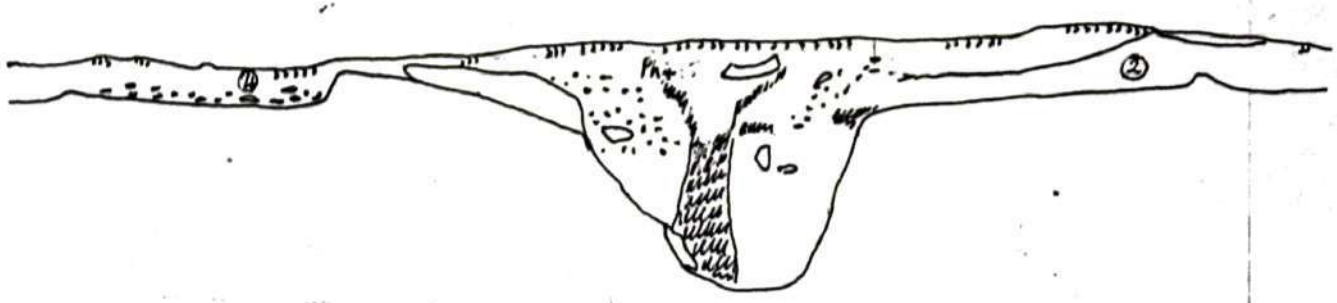


The "Hollow" in 10A & B, 11A & B, Plan and Northern Section across 11B & 10B.
Scale 1:10.



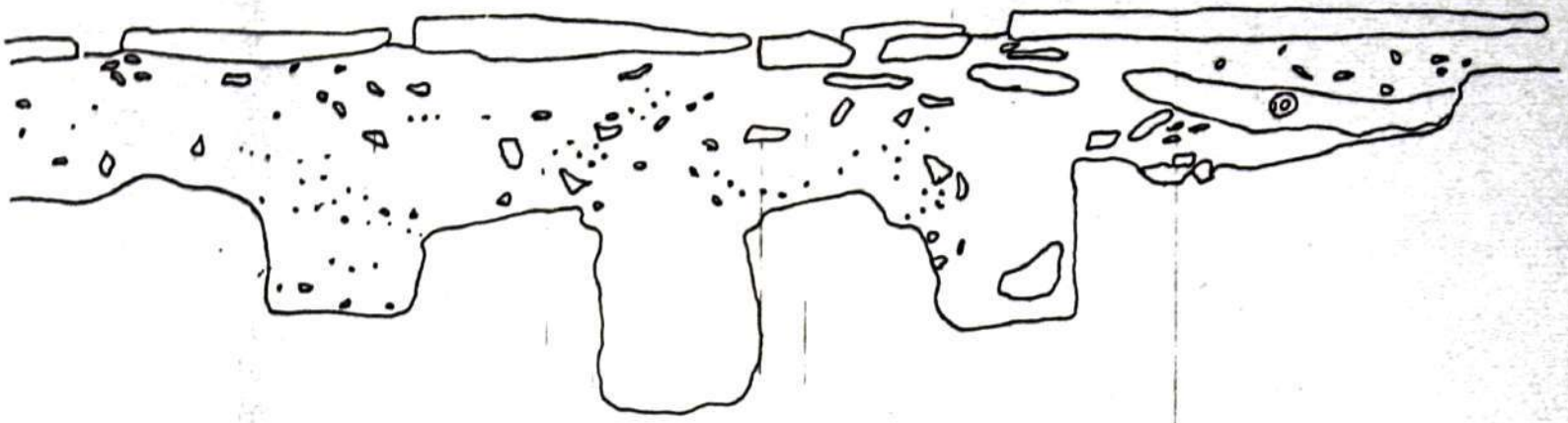
1A Western section, with part of post trench.

(2) orangey brown
(3) darker brown
(4) Mixed dark brown, ash, charcoal
(5) soft orange - natural?
• wood remains



1C Western Section, with Posthole 4.

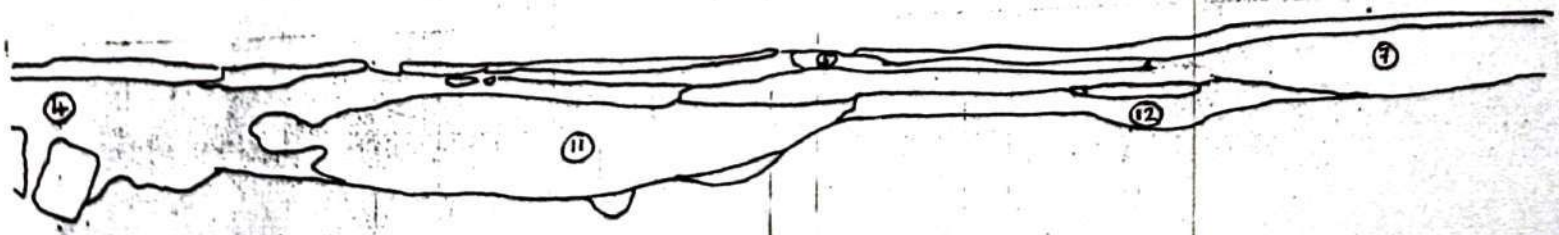
(2) chippy grey fill
(4) orangey brown
wood remains.

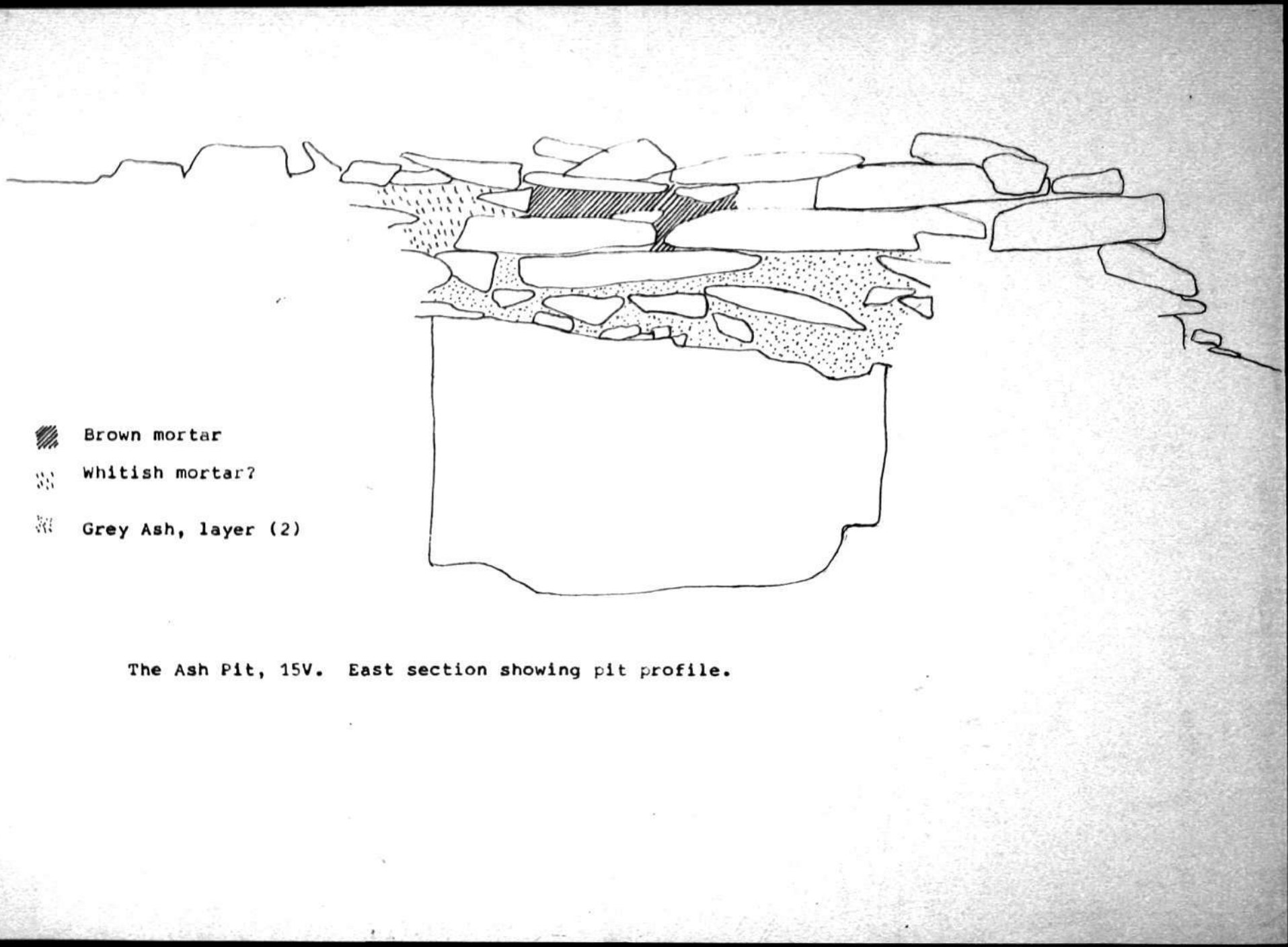


4A Southern section i) at the edge of the paved area.
Mixed dark and lighter brown soil and stones, with (10) biscuit coloured clay.

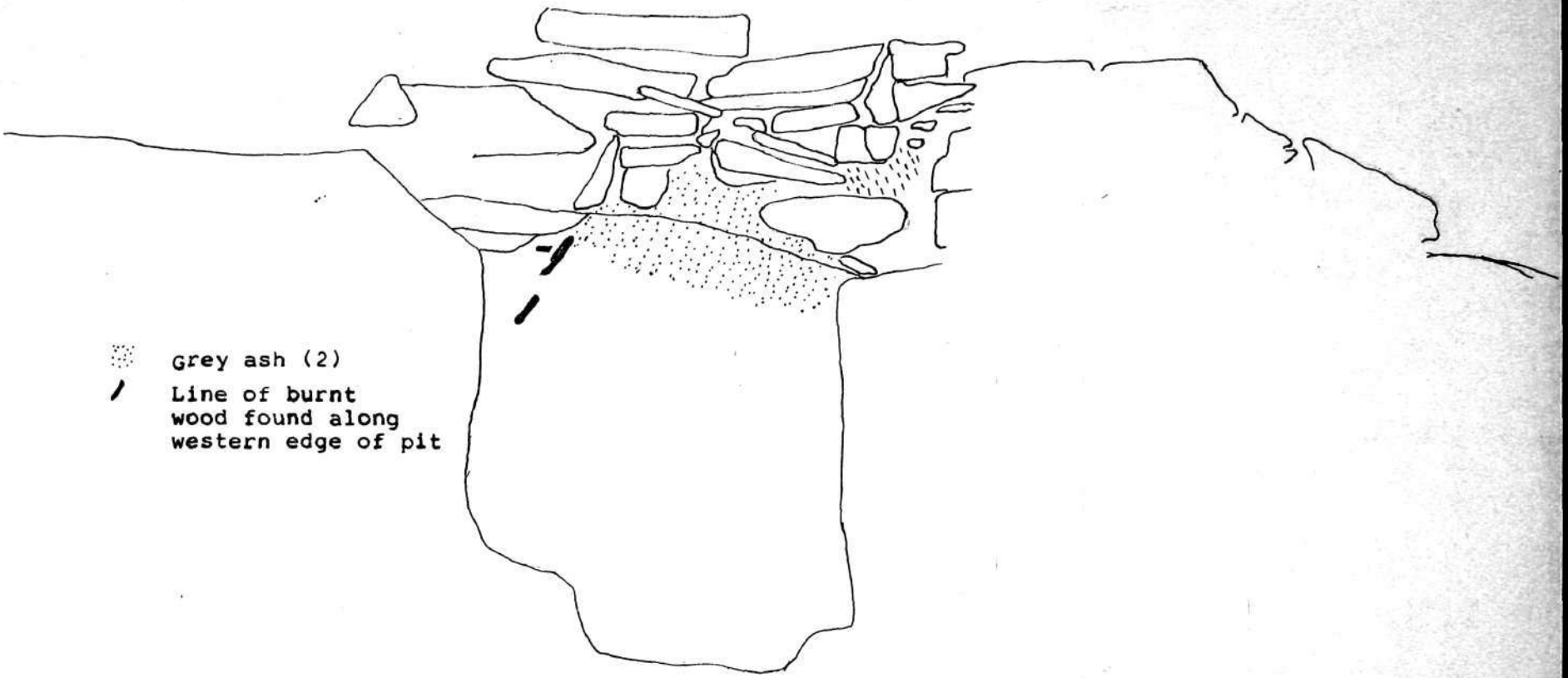
ii) Real southern section, beneath pavement.

(4) Mixed light and dark brown
(7) Light orangey brown
(5) Red brown clay
(11) soft black
(12) brown





The Ash Pit, 15V. East section showing pit profile.



The ash pit, 15V. Northern section, showing pit profile and position of burnt wood.