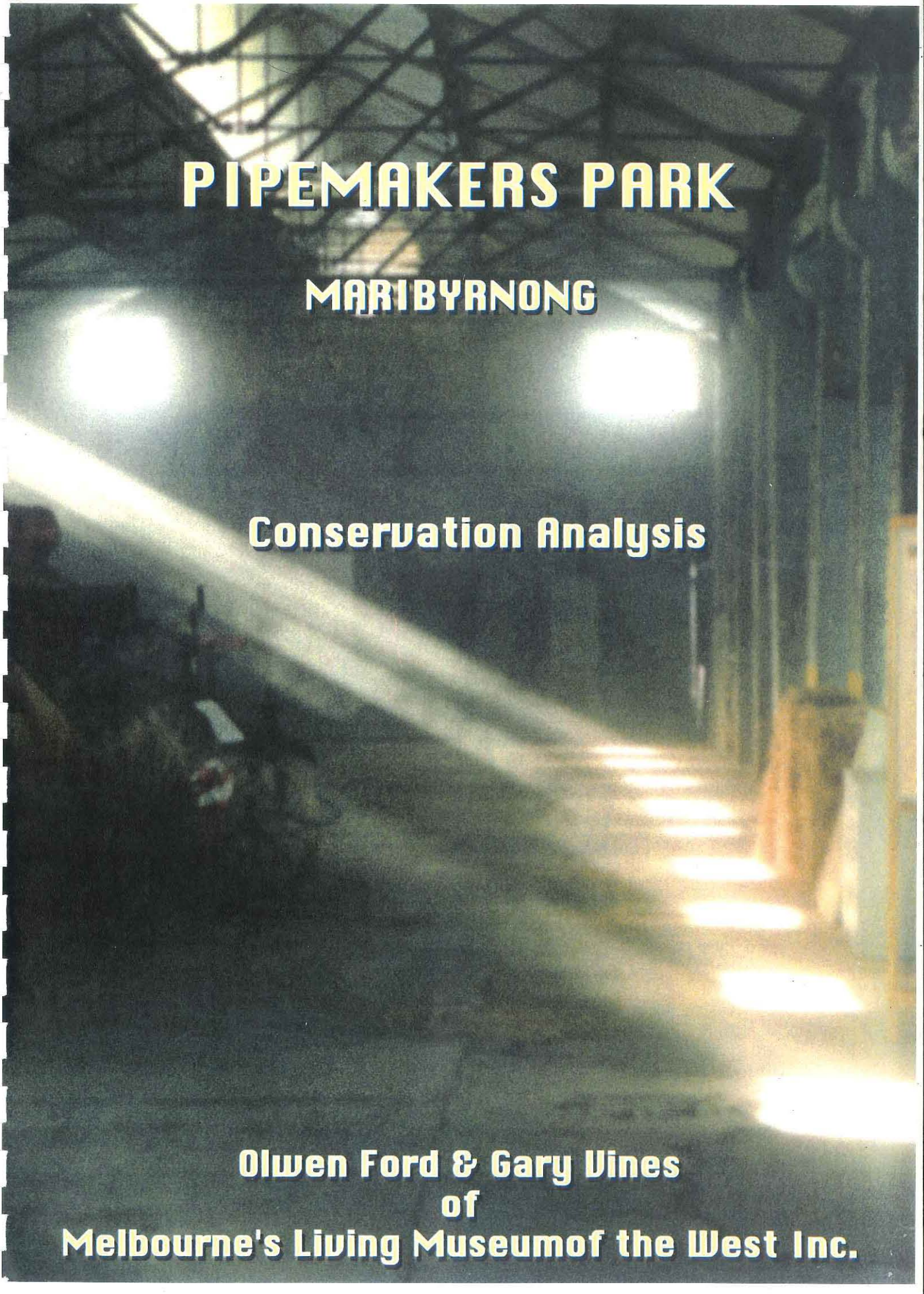

PIPEMAKERS PARK

MARIBYRNONG

Conservation Analysis

Olwen Ford & Gary Vines
of
Melbourne's Living Museumof the West Inc.

PIPEMAKERS PARK

MARIBYRNONG

CONSERVATION ANALYSIS

Olwen Ford
&
Gary Vines

of Melbourne's Living Museum of the West Inc.

PIPEMAKERS PARK

VAN NESS AVENUE, MARIBYRNONG

HERITAGE CONSERVATION ANALYSIS & PLAN

Prepared for

Melbourne Parks & Waterways

by

Melbourne's Living Museum of the West Inc.

with

KaZOO

Melbourne's Living Museum of the West Inc
P.O. Box 60 Highpoint City,
Victoria, 3032

September 1996

ISBN 0 947308 29 6

Executive Summary

This conservation analysis of Pipemakers Park was commissioned by the park's owners, Melbourne Parks & Waterways, and is part of a restoration project in the park, funded by the Government Heritage Restoration Program. The area considered in this study is of exceptional significance in the industrial history of Australia, from its use as a large boiling-down works in Victoria's early pastoral days, to its association with the makers of Australia's first steam locomotive, its contribution to the world's export meat trade as Australia's leading meat cannery for a decade and as Australia's first frozen meat export works, and its role as the principal Australian factory of the Hume firm which pioneered, and exported, the invention of centrifugally-spun steel-reinforced concrete pipes.

Analysis of the surviving bluestone buildings, undertaken as part of this study, has shown that distinct and visible sections remain from the earlier period of the site's history, notably Raleigh's boiling-down works, the iron works of Robertson, Martin and Smith and the early works of the Melbourne Meat Preserving Company 1868-1873, a time when this company was dominating the international market in preserved meats. Part of this analysis has included identifying remaining structural components of the Meat Preserving Company's butchers' shop/early tinshop. Expansion of the factory is reflected in the extensions undertaken in 1872 and the rebuilding of the central portion of the factory after a fire in 1873 (Building 2). The three extant bluestone buildings were all inter-connected in the early years of meat canning activity on this site, and were the heart of the factory's operations.

The study traces the changes in the Hume firm's use of the site from the early 20th century (c.1912) when the main bluestone building (Building 2) was the initial focus of activity for Walter Hume's centrifugally-spun reinforced concrete pipe factory, the first in Victoria and the second in Australia. In the 1920s-30s, when the Humes firm went through a period of innovation and expansion, additional buildings in the study area were constructed, notably the sheds later known as the 'Bottom Factory'. The study indicates that the foundations of Building 6, and related structures, are significant evidence of the pioneering Hume firm's activity and growth and of the factory's use of the site's topography.

The continuing importance of the factory in the later period is reflected in major changes and adaptations in the factory's layout in the early 1940s. These included construction of Building 7 or the 'Top Factory' and the renovation of Building 3 as a substantial fitter's and turner's shop. Building 7 is one of the few Humes buildings surviving within the study area and recommendations are made to assist planning and conservation action in the near future.

Historical summaries are included for each structure in the study area and for relevant structures now demolished, These summaries accompany the analysis of the building fabric.

The Conservation Policy, included in this report, takes into account the cultural significance of the place and its individual buildings and elements, in accordance with the principles of the Burra Charter. Existing statements of significance are reviewed and new statements of significance provided. Recommendations are made regarding all the main extant structures on the site, in terms of conservation guidelines for the owner, on the basis of respect for the significant fabric and adopting a co-ordinated approach. The recommendations include a list of specific works and future possibilities for consideration, including redevelopment options for Building 7; archaeological excavation; reinstatement of earlier features where appropriate; and sympathetic reconstruction, particularly in relation to Building 1. A basic point in the Conservation Policy is that compatible use of the buildings should be a key consideration in future site developments. Commercial activities and adaptive reuse need not be excluded from future use. A review of the existing interpretation plan is recommended.

Statement of Significance for the Place

The surviving buildings, structures and features in Pipemakers Park are of historical, architectural, technological and social significance at a national level for their continuous association with the industrial and commercial development of Victoria and Australia from the 1840s down to the 1970s.

The site represents four, or possibly five, historic industries of very great significance to the history of Victoria and Australia. They include one of the first large scale processing works in the colony (Raleigh's Boiling Down Works - 1848-c.1853); an association with the company which built the first railway locomotive in Australia (Robertson, Martin and Smith's Victoria Iron Works - 1854-55); the largest and most successful of the meat-preserving and canning works in Victoria, (Melbourne Meat Preserving Co. - 1868-86); the first commercial frozen meat export factory in Australia (Australian Frozen Meat Export Company - 1880-82); and one of the first two factories making centrifugally-spun reinforced-concrete pipes in Australia (by the Hume Pipe Company / Humes Ltd. - 1912-1978).

Three of these enterprises (the Melbourne Meat Preserving Company, the Australian Frozen Meat Export Company and the Hume Pipe Company) were important in a world context. The Australian Meat Preserving Company was Australia's leading meat cannery and the largest of its type in the world.[1] The site is also of importance for the association with significant exports of both Australian-made products and Australian-born technologies.

The complex of bluestone buildings is of architectural significance as an outstanding example of a nineteenth century factory complex, executed to a high standard in the local basalt stone and demonstrating local building skills. It is one of the largest mid to late nineteenth century industrial complexes surviving in Victoria, and one of only a handful of large bluestone factories. It is also significant in the history of the introduction of fire-proof construction technology, while the location demonstrates the important locational factors of sea transport via navigable rivers, availability of local building material (bluestone) and access to livestock for processing.

The site is historically significant for its association with important figures: S.S. Ritchie and Walter Hume, and to a lesser extent Joseph Raleigh, Albert Purchas, John Pigden, and William Anderson. The site demonstrates the business acumen, entrepreneurial skill and different philosophy towards manufacturing of Ritchie and Hume. This is especially seen in the contrast between the monumental bluestone buildings erected by Ritchie in the nineteenth century and the more prosaic additions of the twentieth century for which Hume was responsible.

The place demonstrates the pioneering technology and skills of Australian manufacturer, S.S. Ritchie, and the designer and builder of the 1868 works and possibly later additions, Albert Purchas and John Pigden. The Melbourne Meat Preserving Company, established in 1868, was the first such company in Australia and was an innovator in the fields of food preserving, transportation technology, material handling and refrigeration. The firm's expertise was used by many other firms such as the Sydney Meat Preserving Company and Flemington Meat Preserving Company, established by the Melbourne Meat Preserving Company's chief preserver, William Anderson.

The site is also significant as the location of the first successful export freezing company in Australia - the Australian Frozen Meat Export Co., established in 1880-82. This firm became the model for many other such enterprises, including the first frozen meat industry in New Zealand.

[1] Personal communication Prof. Emory Kemp, 18 September 1996, confirms that the American meat canning industry did not commence exporting on a large scale until the mid 1870s.

The site is also significant for its association as one of the earliest and principal works of the Hume Pipe Co. which in the words of G.D. Snooks, 'was the only Australian firm of the pre-World War II period to pioneer a new technology (for the manufacture of concrete and steel pipes) and to export its innovations throughout the world ... [in the form of patent rights] as ... but also included the export of specialised machinery which was produced in the firm's own engineering workshops. Therefore Humes exported capital and technology at a time when other Australian firms were doing the reverse'.[2]

The activities of the Humes firm contributed to many large scale public works projects, not the least of which was the provision of pipes for the construction of water, sewerage and drainage facilities at a considerable reduction in the cost to society. The Maribyrnong factory was also an important training ground for Humes personnel and the site of much of the experimental work of the company.

[2] G.D. Snooks, 'Innovation and the Growth of the Firm: Humes Enterprises 1910-40', in *Australian Economic History Review, No.13, 1973, pp. 16-17.*

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Acknowledgments

This study has been made possible by a grant from the Government Heritage Restoration Program, provided by Heritage Victoria of the Office of Planning, Department of Infrastructure.

Considerable use has been made of three previous studies of the Melbourne Meat Preserving Co. and Hume Pipe Co. buildings. These are: *Factory In Bluestone*, by Olwen Ford, *An Outline History of Pipemakers Park,* by Olwen Ford and *Humes Historic Site,* by Rod Elphinstone. These three documents form the basis of the background history and specific building and feature histories, throughout the report. Assistance has also been provided by staff of several archives and libraries. Staff of the Public Records Office have assisted in the research of documents, the State Library of Victoria staff assisted in the identification of newspaper accounts, and the La Trobe Picture Collection staff provided access to their pictorial material. Sources of original material including photographs and plans are acknowledged throughout the text.

Robyn Mullens, David Hill, Tomas Nohel and Patrick Miller represented Heritage Victoria on the project steering committee. David Collins and John Grinpukel represented Melbourne Parks and Waterways on the project steering committee and provided assistance and documentation relating to the site and its management by MMBW /Melbourne Water / Melbourne Parks and Waterways.

All members of the steering committee gave guidance on the project, and provided detailed input to the various drafts of the report. Their contribution is greatly appreciated.

Consultants

Melbourne's Living Museum of the West has acted as principal consultant in the preparation of this study with the Museum Director, Olwen Ford, and Industrial Archaeologist, Gary Vines, employed on the preparation of the conservation plan and conservation policy. However, the Museum staff were part of an interdisciplinary team with expertise in the relevant fields. The team incorporated skills in documentary and oral history, architecture, engineering, quantity survey and archaeology, with most of the members of the team having skills in more than one area.

The team members and their roles were:

Olwen Ford - Project co-ordinator, and historical research
Gary Vines - Historical research and industrial archaeology assessment
(Melbourne's Living Museum of the West, P.O. Box 60, Highpoint City 3032)

Zvonko Orsanic and Kathi Clark - Architectural measure and drawing, preparation of schedule of works, co-ordination of engineering and quantity survey inputs.
(KaZOO, 99 McKracken St. Kensington, 3031)

A program of conservation works, concepts for development of the site and cost estimates for essential works is included in a separate report also produced by Melbourne's Living Museum of the West in association with KaZOO: *Pipemakers Park , Program of Conservation Works.* 1996.

This second report was also funded by the Government Heritage Restoration Program.
Additional assistance in the preparation of this report was obtained from a consulting engineer and quantity surveyor, namely:

Peter Felicetti, Consulting engineer, DeMelis Felicetti Consulting Engineers Pty Ltd.

Stephen Foley, Stephen Foley & Associates - Quantity Surveyor

1.0 Introduction

1.1 Background and Purpose

The preparation of a conservation analysis for Pipemakers Park was commissioned by Melbourne Parks and Waterways, as part of a larger program of restoration funded by the Government Heritage Restoration Program through Heritage Victoria.

The brief required that the study include three components:

1) a conservation analysis which incorporates previous historical studies on the site and analysis of evidence and the assessment of significance,
2) a conservation policy setting out strategies for its implementation in relation to the relevant historic buildings and structures,
3) the preparation of a schedule of works for the implementation of the conservation plan, along with costings and priorities for the works.

The brief also specified that the conservation plan include the whole site, emphasising a co-ordinated approach to the conservation and management of it.

The study was undertaken by Melbourne's Living Museum of the West Inc., primarily by Living Museum staff, Gary Vines and Olwen Ford, in conjunction with architectural firm, KaZoo comprising Zwonko Orsanic and Kathi Clark. Additional sub-consultancies were retained for specialist input - structural engineering from Peter Fellicetti of DeMelis Fellicetti Consulting Engineers Pty. Ltd. and quantity survey from S.J. Foley & Associates Pty. Ltd.

The Conservation Plan and Policy has also been prepared in the context of the specific Melbourne Parks and Waterways management objectives. A development strategy for the park was established in public meetings and discussions between MMBW, Department of Planning and Environment, City of Sunshine and community representatives in the early 1980s. This was confirmed in subsequent reports of the MMBW PRPR committee. The development strategy was also prepared in conjunction with broader policy for the Maribyrnong River valley, which is documented in the *Maribyrnong River Plan* 1984 and the *Lower Maribyrnong River Concept Plan* 1984.

The *Lower Maribyrnong River Concept Plan* provided that a strip of land 30 metres from the right bank of the Maribyrnong River should be managed as 'parkland', that a berth for pleasure cruisers' be developed near the bluestone buildings and a footpath/bicycle path be created along the river edge. The *Maribyrnong River Plan* identified the Humes land as 'parkland' and the flood-prone council land and adjacent Commonwealth property is shown as 'wetland', while it also specified that '...the property should be developed in an integrated manner incorporating the historically significant buildings and areas of wetland and parkland.' Concurrently, i.e. in late 1984, the City of Sunshine was conducting preliminary planning for the development of the adjacent Thompson Reserve as an indigenous, native botanical garden.

The Melbourne & Metropolitan Board of Works purchased the site in 1978 from Humes Ltd. for use as parkland at the request of the Sunshine City Council and subsequently carried out stabilisation and preservation works, as well as cleaning up the site, landscaping and providing visitor amenities as part of a $2 million Bicentennial development grant. As part of the development, one of the buildings was refurbished and leased to Melbourne's Living Museum of the West for use as their offices and visitor centre.

Several studies were subsequently commissioned which continued the strategy for management and development of the site. These included an assessment of potential commercial operations in the park,[3] a feasibility report for interpretive developments of Building 7,[4] a management plan for the development of nature conservation areas and management of wetlands,[5] and an interpretation plan for the park.[6]

[3] Ernst & Whinney Services. *Final Report, Commercial Use of Pipemakers Park,* report to MMBW, December 1988.

[4] David McCabe Design Pty Ltd & Nina Stanton & Associates Pty Ltd, Feasibility Report, to MMBW, December 1991.

[5] Chris Riseley, *Wetlands at Pipemakers Park, Recommendations for management,* report to MMBW, 8 February 1991.

[6] Gary Vines, *Draft Interpretation Plan for Pipemakers Park,* Melbourne's Living Museum of the West, 1990.

1.2 Study Area and site location

The site, now known as Pipemakers Park, is located off Van Ness Avenue, Maribyrnong, (Melways Reference Map 28 B10). The park comprises approximately eight hectares, bounded on the west by Thompson Reserve, on the north by Van Ness Avenue, on the east by the Maribyrnong River and on the south by the former Commonwealth Defence Department land, now the ADI Footscray Development Site. The subject land is comprised of subdivision 5111 Lot 6 which is part CAs 6 and 7 Section 21 (volume 9323 folio 300) title for which was transferred from Humes Limited to the Melbourne & Metropolitan Board or Works on 29 December 1978.

The site is now owned and managed by Melbourne Parks and Waterways. Pipemakers Park is in the City of Maribyrnong and the suburb of Maribyrnong (formerly part of the City of Sunshine). Thompson Reserve is a council-owned park adjacent to Pipemakers Park, and along with other Council and Commonwealth-owned land adjoining the Parks & Waterways land on the south side of the park, is managed in co-operation with Melbourne Parks & Waterways. Ownership of the various parcels of land is indicated in the site plan (figure 2).

Melbourne's Living Museum of the West occupies one of the historic bluestone buildings for its office, resource centre and exhibition space. This is leased from Melbourne Parks and Waterways. The remaining buildings are generally unused, and maintained as secure shells without public access. Open space at the southern end of Building 7 is currently used as a storage area and plant nursery by the Koorie Garden Team on a temporary basis.

The site is located on the flood plain and escarpment edge of the Maribyrnong River Valley, with some buildings coming within a few metres of the river bank. Several of the buildings have floor levels below the one in a hundred flood levels. Entrance to the site is from Van Ness Avenue, at the junction with Gordon Street and Warr's Road. This is also one of the entrances to Highpoint City Shopping centre, which is built in the former bluestone quarries at the top of the escarpment to the west of the park.

This site was the location of several significant historical industrial enterprises including an early boiling down works, railway engineering foundry, one of Australia's earliest and largest meat canneries, the first meat freezing works in Australia, and one of the first reinforced concrete pipe works in Australia. Evidence of each of these stages can be found in documentary records, surviving structures and archaeological evidence.

Context of the site

The site is located in an inner urban area, which is poised to expand rapidly with the development of several large adjacent industrial sites including the ADI munitions factories and the Maribyrnong Explosives Factory nearby. These, in conjunction with the existing urban consolidation projects such as Lynch's Bridge and the Angliss Estate and the large and expanding Highpoint Shopping Centre nearby, will put additional pressure on Pipemakers Park to provide local and regional recreation and heritage interpretation facilities. It is in this context that an appropriate Conservation Plan and Policy is required.

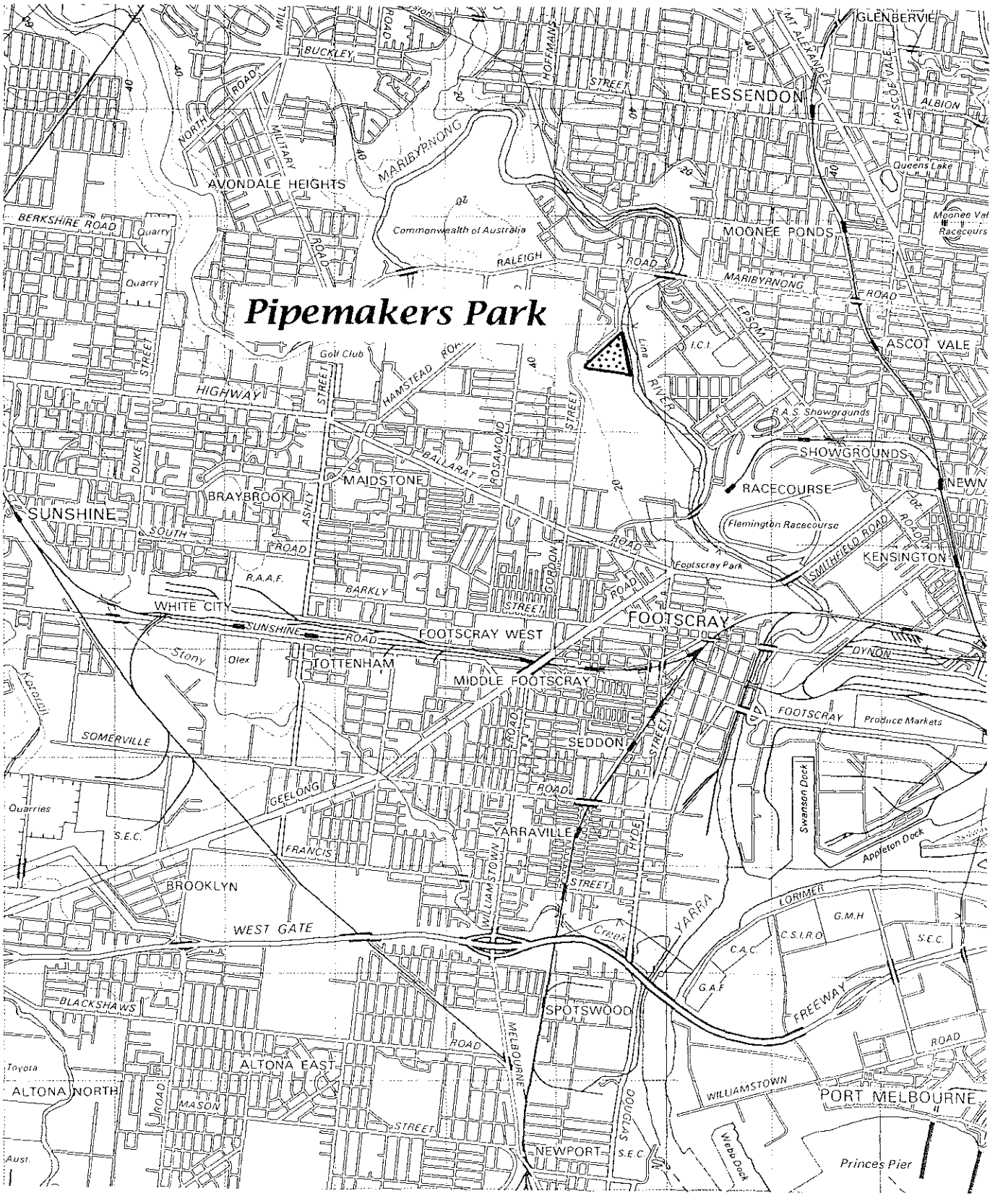

Figure 1. Location Plan. (reproduced from MMBW Strategy Planning Series 1:50000 Map 2-3)

Geographic context

Pipemakers Park is located in the Maribyrnong River Valley. It includes flood plain and escarpment edge land. At the northern extreme of the park the river meander approaches the foot of the western escarpment of the river. This probably resulted in a small cliff on the river bank which would have been difficult to traverse for anyone following the west bank of the river (as later demonstrated by the considerable earth works required for the construction of Van Ness Avenue). The historic buildings in Pipemakers Park are located at the foot of the escarpment, and therefore at the edge of the flood plain, and several have been set back into excavations in the hillside.

At the top of the escarpment is the edge of the Keilor-Werribee plain, characterised by deep layers of very dense bluestone, formed by lava flows from effusive volcanoes to the north west between one and three million years ago and known as the "Newer Volcanics". At the bottom of the escarpment are Tertiary sediments known as the "Red Bluff Sand" and other volcanic layers known as the "Older Volcanics" which underlay the basalt and have been exposed by the cutting-down of the river valley. In some places the sediments show colourful staining as a result of strong mineralisation. The flood plain is formed from alluvial sediments - heavy clays, silts and some minor gravel lenses known as the 'Coode Island Silt' - and lies naturally about one to three metres above the normal high watermark.[7] The banks of the river would have been under constant erosion and sedimentation, prior to the construction of the artificial rock beaching in the 1930s. Much of the flood plain in the park has been raised between one and two metres, by the dumping of fill and factory waste.

The river is tidal adjacent to the park, and remains so up to a once natural ford at Avondale heights, about 18 kilometres from the mouth of the river. The flood plain is still regularly inundated every seven to ten years, with major floods in 1906, 1911, 1916, 1947, 1974.

[7] Geological Survey of Victoria, Melbourne Sheet, SJ55-1. Mines Department 1974.

1.3 Listings and Classifications

Victorian Heritage Register

The site is listed on the Victorian Heritage Register, formerly listed on the Government Buildings Register (Register Number G 216) It is also registered on the Historical Archaeological Site Register (Site Number 7822H-0023). The Victorian Heritage Register listing applies to 'bluestone buildings and part bluestone buildings' and so is limited to the nineteenth century structures on the site. Under the *Heritage Act* 1996, a permit is required from the Heritage Council, for any alterations, additions or demolition to a registered building or site. the Heritage Act also requires that a permit be obtained prior to the disturbance, excavation or destruction of any archaeological material.

Australian Heritage Commission

The Former Melbourne Meat Preserving Company has been included on the Register of the National Estate (Register number 005495). The full citation for the site is included in Appendix B. The AHC listing covers the area bounded by the Maribyrnong River, Van Ness Avenue, and a line projecting from River Street. As such, the listing applies to all structures from the meat works and Hume Pipe Co. periods, but does not include the modern additions such as the toilet blocks and caretaker cottage. The *Australian Heritage Commission Act* only regulates the alteration of destruction of sites on the Register of the National Estate, where the Commonwealth Government is the owner of the site. However, in some cases, the provision of Federal grant funding may be conditional on compliance with the AHC Act

National Trust of Australia (Victoria)

The former Melbourne Meat Preserving Company works/ Hume Pipe Works has been classified by the National Trust of Australia (Victoria) as of State Significance. (National Trust File No 4730) The National Trust Citation is listed in full in Appendix B. The National Trust classification does not specifically define an area of designation, but includes both the meat works and Hume Pipe Co. buildings. While the National Trust does not have any legal of statutory power to preserve a site which it has classified, as the principal community heritage organisation in Australia, it plays an important role in focussing public opinion and lobbying for the protection of heritage places.

Western Region Industrial Heritage Study

The Melbourne Meat Preserving Company/Hume Pipe Works was recorded in the *Western Region Industrial Heritage Study* by Gary Vines for Melbourne's Living Museum of the West. In this study the site was identified as 'one of the most significant industrial sites in Victoria if not Australia' with architectural, historical and archaeological importance. The citation from that study is included in full in Appendix B.

Planning Schemes

In the local section of the City of Maribyrnong Planning Scheme, Pipemakers Park is zoned Proposed Public Open Space, with the strip of former Commonwealth land along the south, zoned Public Purposes (Office of Defence Production), Thompson Reserve zoned Existing Public Open Space and a strip along the east side of Van Ness Avenue is zoned Proposed Road Widening. A strip of land, generally below the three metre contour is denoted Floodway Management Area & 100 year Flood line, while a strip about 30 metres from the river bank is identified as the Lower Maribyrnong Concept Plan.

The site was not included in the heritage study of the former City of Footscray carried out by Graeme Butler, as it was outside of that municipality, and the former City of Sunshine, which included the site, had not carried out any heritage study in its municipality before the council amalgamations. The planned City of Brimbank Heritage Study will not deal with Maribyrnong as this area, formerly part of the City of Sunshine, has now been transferred to the City of Maribyrnong.

The relative areas designated under the above registers are identified in Figure 3.

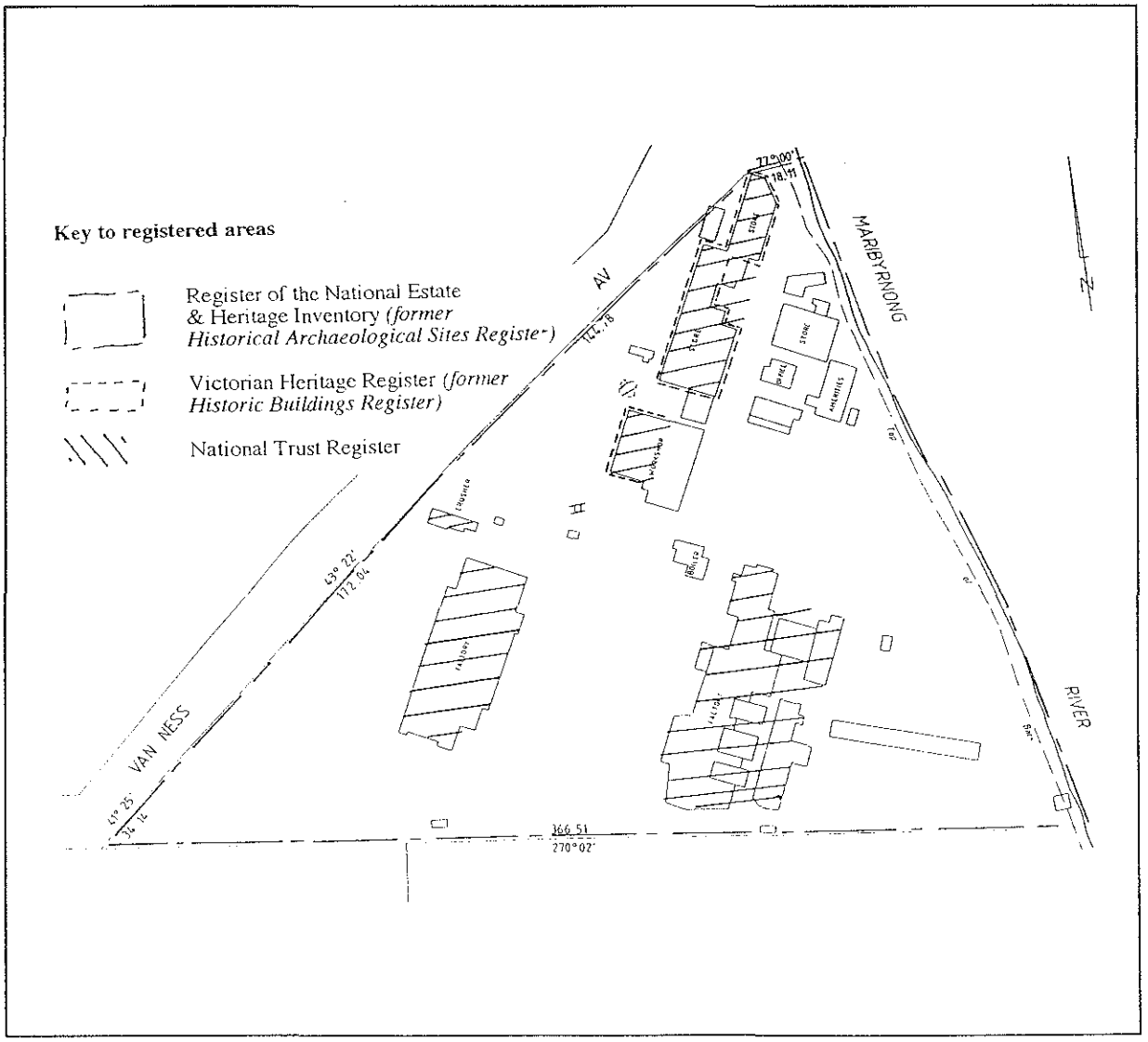

Figure 2. Site Plan showing areas designated under the various heritage listings.

1.4 Methodology

The purpose of this study is to provide a conservation analysis and assessment of significance of Pipemakers Park and its component parts, buildings, structures and landscape features and to provide guidelines in the form of a conservation policy, for future management of the site in order to conserve its cultural significance. In this context the study also provides a schedule of works for essential and other possible conservation and restoration works.

The study has been prepared in accordance with the principles of the Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (the Burra Charter) and generally follows the format of the Australia ICOMOS guidelines for the preparation of conservation plans and J.S. Kerr's *The Conservation Plan.*[8]

The study has involved the compilation and review of documentary research conducted to date and available existing data, including maps, plans, photographs, illustrations, oral histories, original contemporary sources and secondary published sources, e.g. contemporary newspaper accounts, the Humes Papers at the ANU Archives, planning reports, aerial photography, photogrammetric recording and documentation of structural works carried out by the MMBW. Additional research has been carried out as warranted, e.g. more comprehensive search of early newspaper accounts and obtaining full text of documents cited in secondary sources, title details, rate book and directory listings. The bulk of the historical research and writing has been carried out by Olwen Ford.

The analysis of the building fabric has been undertaken by documenting the nature and extent of physical evidence, eg. floor, wall, roof and ceiling surfaces, building materials, evidence of alterations/additions/demolitions, surviving fittings, etc. This investigation has been non-intrusive. The findings of a series of small archaeological test excavations carried out in 1993 has also been incorporated in the study. The analysis has been carried out by Gary Vines in consultation with Zwonko Orsanic who has prepared existing conditions drawings incorporating results of the site investigation and using existing drawings where possible.

8 J.S. Kerr, *The Conservation Plan,* National Trust New South Wales, 1990, p. 6.

Building Number	Building Name
1	1872 tinshop
1A	c.1857 tinshop
2	Preserving Dept.
2A	Workshop
2B	Stable
2C	Lean-to on Building 2
3	1868 Testing Dept.
3A	1868 Tin Store (demolished)
3B	c1930 Humes garages (demolished)
4	Humes boiler house (demolished)
5	Humes store sheds (demolished)
6	Bottom factory 6 & 8 ft. pipes
7	Top factory 4 & 6 ft. pipes
8	Electricity substation
9	Sand Chutes
10	Pipe racks
11	Chimney base
12	Humes workers garden
13	Small crushing plant (demolished) (bluestone retaining wall survives)
14	Original boilerhouse & Testing Room (demolished)
15	Workshop - steel store (demolished)
16	Tramways
17	1855 School (demolished)
18	Slaughterhouse (demolished)
19	Wharves (demolished)
20	Shed behind Building 3 (demolished)
21	Sheds on riverbank (Cooper's department) (demolished)
22	Sheds in c1880 view (demolished)
23	Concrete seasoning tanks (demolished)
23	Toilet block (demolished)
24	Slab factory and steam chambers (demolished)
25	Office (demolished)
26	Conduit Plant/Testing Department (demolished)
27	Caretakers residence (demolished)
28	External pressure testing machine (demolished)
29	Crushing Plant (demolished)
30	New amenities building, showers and lockers (demolished)
31	Compressor shed (demolished)
32	Shed east of building 1. (demolished)
33	Tester (demolished)
34	Shed on pipe racks (demolished)
35	Amenities block (demolished)

Figure 3. Site Plan showing location and numbering of main buildings.

1.5 Terminology

The terminology used in this report which is specific to conservation practice has been defined in the Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (the Burra Charter) as endorsed by the Australian Heritage Commission. The relevant terms used in this report and their definitions are listed here.

'Place' means the site, area, building of other work, group of buildings or other works together with associated contents and surroundings.

'Conservation' means the process of looking after a place so as to retain its cultural significance. It includes maintenance and may, according to circumstance, include preservation, restoration, reconstruction and adaptation.

'Preservation' means maintaining the fabric of a place in its existing state and retarding deterioration.

'Restoration' means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new materials.

'Reconstruction' means returning a place as near as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the fabric. This is not to be confused with re-creation or conjectural reconstruction which are outside the scope of this charter.

'Adaptation' means modifying a place to suit proposed compatible uses.

2.0 Documentary History

2.1 Chronology

50,000 BP - onwards	Occupation of the study area by Aboriginal people.
1803	Charles Grimes and James Fleming explore Maribyrnong River and pass study area
1835	John Batman explores Maribyrnong river valley, draws map, records observations.
1836	First permanent white settlement on Maribyrnong River
1839	Subdivision of lands around Melbourne into parishes and numbered sections
1840	First detailed map of Maribyrnong River and valley, including study area
1843	Joseph Raleigh, English merchant, arrives in Melbourne with his family
1845	James Johnston obtains annual occupation licence at auction for Section 21 (including study area)
1846	Joseph Raleigh operating salted meat works and boiling-down works at Yarraville. Raleigh living at 'Mona Vale, Moonee Ponds'
1847	Joseph Raleigh purchases 409 acres in Maribyrnong, including study area.
1848	Construction of Raleigh's boiling down works on his land at Maribyrnong
1849-52	Growth in tallow exports from Port Phillip (re-named 'Victoria' in 1851)
1851	Onset of Victorian gold rushes
1852	Death of Joseph Raleigh
1853	Rachel and Sarah Raleigh, sisters of Joseph Raleigh, buy additional Maribyrnong land
1854	Establishment of Robertson, Martin & Smith's Victoria Iron Works in study area
c1855	Water colour drawing of study area by Greeves, including large building by the river
1857-8	Sub-division of Portions 4, 5, 6 and 7, section 21, including study area
1858	Portions 6 and 7 bought by Henry William Dauglish, and mortgaged
1866-7	William Cameron leasing farm on Saltwater River, from 'Raleigh's trustees'
1867	Formation of Melbourne Meat Preserving Company, 30 December 1867
1868	Melbourne Meat Preserving Company leasing 174 acres of land and 'premises' from George Petty, adapting buildings, constructing new buildings

1870	Melbourne Meat Preserving Company purchases site from George Petty. Also leasing 2,919 acres of land in what is now West Sunshine (for grazing of stock)
1872	Extensions to works - new tinsmiths' shop and machinery room
1873	Fire destroyed kitchen, preserving room and cooling room, 7 December 1873
1874	Repair and re-building of central portion of factory. Building enlarged
1876	Factory renovated. New boiler, additional preserving pans and tallow vats added
1877	Increase in productivity (262,532 sheep slaughtered October '76-April '77)
1878	Rise in price of sheep, overseas competition, decrease in demand
	Introduction of square tins. Company won gold medal at Paris exhibition
	Manager, S.S. Ritchie, invents new tin-filling process
1879	Death of S.S. Ritchie, company manager
1880	Commencement of operations on site by Australian Frozen Meat Export Company
1881	Melbourne Meat Preserving Company works almost idle April-October
1882	Freezing works transferred to Newport
	Meat preserving operations suspended April- October
1885	Factory running at a loss
1886	Closure of works. Factory and company's land put up for sale
1888	Thomas Warr, merchant, purchases study area. Maribyrnong quarry in operation
1896 -1901	Slaughterhouse operating in study area
1906	Presbyterian Church of Victoria purchases 170 acres, including study area
1908	Sub-division plan of land, including study area, showing 'old stone buildings'
1910	Walter Hume's invention of the centrifugally spun reinforced concrete pipe, in S.A.
1912	Walter Hume and his brother begin operations in Maribyrnong, leasing study area from Presbyterian Church and using existing bluestone buildings
1913	Walter Hume on a world trip
1914	Melbourne Directory lists 'Hume Bros. Cement Iron Works' in Maribyrnong
1915	Hume Bros. purchase 34 acres (including study area) from Presbyterian Church
1916	Hume family living at Maribyrnong
1920	Formation of new company - Hume Pipe (Australia) Company Ltd.
1921	Two moulding machines in operation at Maribyrnong

1922	Machinery operated by electric motor, one and a half to eight horse power
1923	Factory producing concrete slabs. Influenced importance of other concrete products
1923	Walter Hume manufacturing arc-welded steel pipes at Footscray Hume Steel Ltd.
1920s	Construction of building which later became known as the 'Bottom Factory'
c1925	Construction of sub-station
1926	'Works' owned by Hume Pipe Co. Ltd. listed in rate book as having NAV of £432
1920s	Use of electrically-operated moving overhead lifting apparatus
1929	Hume Pipe Co. leases five acres of land from the Commonwealth for pipe storage
1940s	Construction of 'Top Factory'
1943	Death of W.R. Hume and also of his eldest son, Walter
1950	Hume Pipe Co re-named Humes Ltd.
1951	Humes firm' largest manufacturers of steel reinforced concrete pipes in Australia'
1960	Humes Ltd. buys out W.R. Hume Pty. Ltd - rival firm established by Hume family
1974	Humes' application for planning permit to develop plant refused
1974	Severe flood on Maribyrnong, halts production at Hume Pipes - 15 May
1976	Re-zoning of land from 'General Industrial' to 'Proposed Public Open Space'
1977	Humes Ltd. purchases five acres of land from the Commonwealth for pipe storage
1978	Purchase of study area by Board of Works
1979	Transfer of operations to Laverton. Closure of factory at Maribyrnong
1980	Dispute between Board of Works and City of Sunshine about purchase of study area
1981	Proposed amendment 157 to Metropolitan Planning Scheme
1983	Demolition of Amenities Building
1984	Brief prepared for stabilisation work
1984-6	Demolition of various sheds including bottom factory
1985	Community consultation re future of study area
1986	Stabilisation and excavation works around bluestone buildings
1987	Bicentennial grant of $2 million for development of 'Historic Parklands', later Pipemakers Park
1988	Opening of Pipemakers Park

2.2 Summary of Sources

Significant primary historical source material is available for the compilation of the history of Pipemakers Park. This takes the form of newspaper accounts of the factory, reports of company meetings, business records of the nineteenth century meat works, and business papers of the Hume Pipe Company, held at the ANU archives. This material has previously been used in secondary sources, and in particular, the *Humes Historic Site Investigation and Conservation Report,* by Rod Elphinstone, and *Factory in Bluestone* by Olwen Ford. The following historical sections are based on a more extensive account by Olwen Ford, *An Outline History of Pipemakers Park*, Melbourne, 1996.

Two other important secondary sources, which provided the original indication of the historical importance of the site in an Australian context, are Keith Farrer's *A Settlement Amply Supplied,* and G.J.R. Linge's *Industrial Awakening*. A summary of the main sources is included here, while a more comprehensive bibliography is included at the end of this report.

1. ***Contemporary documents and printed material***, including:-
* illustrations and photographs
* film footage (for the Humes era)
* maps and plans
* ratebooks
* directories
* titles records
* reports of company meetings (mainly in relation to the Melbourne Meat Preserving Company and the Australian Frozen Meat Export Company, whose half-yearly company meetings were regularly reprinted in the *Argus* and sometimes the *Age*).
* newspaper and journal reports and articles
* typed papers and notes (mainly in relation to the Hume Pipe Company and Humes Ltd, and held by Business & Labour Archives, ANU, Canberra)
* inquests
* birth, death and marriage certificates
* shipping lists
* schools correspondence held by the Public Records Office, Victoria
* defunct company files
* parliamentary papers
* Statistical Register of Victoria

2. ***Oral evidence, recorded in note form or on audio-tape.***
This applies especially to the period of the Hume Pipe Company and Humes Limited.

3, ***Evidence of the physical fabric***
Recent analysis by archaeologist, Gary Vines, has been especially valuable in this respect. This includes excavation in 1994 of the site of the early boiler house, and recording of archaeological evidence during various trenching for drainage and services.

4. Detailed studies and theses
There are a considerable number of theses and detailed works relevant to the study area. In fact, it seems that more Ph.D's have written in depth about this site than any other site in Australia. This is because of the site's very significant role in Australia's industrial history. Particular mention should be made of the work of Dr. T.G. Parsons, Dr Alan Beever, Dr. G.J.R. Linge, Dr. K.T.H. Farrer, and Dr. G.D. Snooks

*5. **Books, articles and reports***
These range from the accounts by E. Finn ('Garryowen'), writing in 1888 about the years 1835-1850 or Thomas Flynn's 'History of Braybrook', written in 1906, to more recent works such as Dr. John Lack's *History of Footscray* and Lenore Frost's '*Murder on the Mount Alexander Road.*

*6. **Submissions and letters***
A number of submissions were made to the Historic Buildings Preservation Council in relation to the study area. Olwen Ford received some correspondence, e.g. from Dr. K.T.H. Farrer, in relation to the study area.

2.3 Aboriginal History

The study area is situated within the Maribyrnong Valley. Upstream, at Keilor, archaeological evidence, has proved the presence of Aboriginal people in the valley more than 13,000 years ago and possibly as much as 40,000 years ago.[9] The climate, topography, fauna and vegetation changed considerably during this period. So did the technology of the inhabitants.[10]

Between 30,000 and 10,000 years ago, the lower reaches of the river valley were far deeper. Then, from about 5,000 years ago a warmer climate led to higher sea levels and the flooding of the valley as far as Essendon. Evidence of this has been found in fossils of sharks, dolphins and shellfish.[11] Gradually, the deposits of sediment built up to form a flood plain.

At the time of white exploration and settlement, the Marin balluk people were the local clan, occupying land extending west and south of the Maribyrnong River to Kororoit Creek and north to Sunbury which was recorded as their headquarters. Ceremonial earth rings still surviving at Sunbury were probably the sites of Marin balluk corroboree and other ceremonies. According to the Chief Protector of the Aborigines, George Augustus Robinson, Marin balluk meant the people at the big water (the Saltwater River).[12] The Marin balluk were part of the Woiwurung language group, who along with the Jajowrong, Wathaurung, Bunurong, and Taungurung, had a cultural affinity to the extent that they banded together to form a larger group known as the Kulin nation. At the time of contact with whites, the clans were led by clan heads known as *Ngurungaeta.* The *Ngurungaeta* of the Marin balluk was Bungarim (c.1800/2-March 1848) and his son Marmbul (c.1822-September 1848). Bungarim has been identified as one of the signatories to Batman's 1835 'treaty' with the Port Phillip Aborigines.[13]

Early settlers noted that the river valleys were often used as travelling routes by Aborigines and Parker called these areas 'their ordinary place of resort' where Aboriginal groups would utilise their most abundant sources of food.[14] The river was also a clan boundary and there were rules regarding times of crossing.[15]

An account by a member of an early settler family, who lived near the study area, further upstream, shows that the river was a valuable food resource for Aboriginal people, according to the season. At certain times of the year it teemed with fish and attracted crowds of water birds.[16] It is likely that Murnong, or yams, grew plentifully in the valley. Red river gums along the river banks yielded useful timber for shelters, implements and weapons. The escarpment offered a good viewing point from which to detect activity further down the valley.

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[9] Gary Presland, *Aboriginal Melbourne: the lost land of the Kulin people*, Melbourne, 1985; new edition, 1995, p.128.

[10] Josephine Flood, *Archaeology of the Dreamtime*, Sydney and London, 1983, pp.148-152.

[11] Edmund D.Gill, *Melbourne before history began*, Sydney, c.1968, pp. 9-10.

[12] Ian D. Clarke, *Aboriginal Languages and Clans, An Historical Atlas of Western and Central Victoria*, 1800-1900, Monash Publications in Geography, No 37, 1990.

[13] Dianne Barwick, 'Mapping the Past: an atlas of Victorian clans 1835-1904' in *Aboriginal History*, 8:100-132; Robert Mate Mate, Notes for the exhibition, *The Amazing Maribyrnong*, 16 April 1989, quoted Olwen Ford and Pamela Lewis, *Maribyrnong: Action in Tranquillity*, Melbourne, 1989, p. vii.

[14] Parker in Michael Cannon, 1982, Aboriginals of Port Phillip. *Historical Records of Victoria*, Foundation Series 2A, 1982 p.693; Michael Cannon, Aboriginals and Protectors 1838-1839. *Historical Records of Victoria*, Foundation Series 2B 1982; Addis in K.N., James, 1983, *Werribee: the first hundred years*, Werribee Historical Society

[15] Larry Walsh, Aboriginal Cultural Officer with Melbourne's Living Museum of the West, 10 July 1996.

[16] Alfred Solomon's recollections, quoted by Thomas Flynn, 'History of Braybrook District', Braybrook, 1906.

The study area was probably not a major camping place, because, as a tidal river it lacked the important fresh water which determined camp sites. The Aboriginal people were also aware of the frequency of floods and warned the early settlers of the danger that could come from the Yarra and Saltwater (or Maribyrnong) Rivers.

No archaeological evidence has yet been found of Aboriginal activity in the study area itself. One isolated artefact occurrence at the adjoining ADI site was noted in a recent study[17] and several other sites and artefacts have been recorded further up the river valley, including quartzite knives and axe heads at the Explosives Factory Maribyrnong which were found during excavations for the construction of that factory.[18]

[17] See Wilson Sayer Core Pty.Ltd., *ADI Footscray Redevelopment Environmental Effects Statement*, p.17. This refers to a survey by Hilary Du Cros to record and assess Aboriginal archaeological sites on ADI's Footcray site. One isolated artefact occurrence was recorded on the Footscray site, adjacent to an electricity pylon approximately halfway along the river frontage. The artefact occurence was in poor condition and had been disturbed by dumoing of fill. It was rated as of 'very low significance' and was not recommended for retention.

[18] Hugh Anderson, *Saltwater River History Trails*, Melbourne, 1984, p.61.

2.4 Early Settlement and First Industries

European discovery and settlement

The study area is within one of the first areas of Victoria to be explored and settled by. Europeans. The first European explorer to pass by the study area was Charles Grimes, Surveyor General of New South Wales, about mid-morning on 3 February 1803. He and his party came up the Maribyrnong River by boat, noting the river's salt water, the absence of trees, except for two dingles, and the lack of fresh water. Further upstream from the study area they noticed some straggling she oaks by the side of the river and 'a place the natives had made for catching fish'.[19] In his diary Grimes commented: 'traced up the NW branch of the river where the land was high and covered with stones and where low a swamp.' [20] His map, remarkably accurate, showed the course of the river as far as Braybrook/Avondale Heights and included annotations on the open grassy plains and the stony ground. His expedition reports did not encourage settlement.

On 3 June 1835, John Batman followed the Maribyrnong River and surrounding plains for some miles, 32 years later, looking for new pastures on behalf of the Port Phillip Association of Van Diemen's Land. He commented: 'In passing up the banks passed over several rich flats, about a mile wide and two or three long, not a tree, and covered with kangaroo grass above my knees'.[21] Batman may have walked in the vicinity of the study area or he may have cut across Maidstone, rejoining the river at Braybrook.[22]

Batman's treaty with Aboriginal leaders north of Melbourne, during his explorations, quickly led to occupation of the ceded land. J.H. Wedge arrived, weeks after Batman, to allocate portions of the land to members of the Port Phillip Association. According to his map, it would appear that the study area was in Portion 11, allocated to Mr Collicot, and later transferred to J. T. Gellibrand. About the same time, independent settlers and their sheep were moving in, beginning with John Aitken in August 1835. The New South Wales government did not recognise Batman's treaty and soon began issuing pastoral licenses to settlers in the Port Phillip District.

The country west and north of Melbourne was preferred by the new settlers initially. As one historian noted; 'In the primitive days the country over the Yarra was not much regarded. The favourite spots were Indented Head, the Exe or Werribee and the Saltwater River'.[23] This is borne out by the statistics of the 1836 census, Within 18 months of Batman's exploration there were almost 20,000 sheep and 71 settlers 'on the Saltwater River', especially in the upper reaches where there was fresh water. The household nearest to the study area in 1836 was probably that of the Cotterell/Ferguson/Solomon establishment, with ten settlers and 3,700 sheep.[24]

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[19] James Fleming, 'Journal of Exploration of Port Phillip, made by Charles Grimes, Surveyor General of New South Wales', in J.J.Shillinglaw (ed.), *Historical Records of Port Phillip*, Melbourne, 1879, p.27.

[20] Charles Grimes, Journal of Expedition to Port Phillip 1802-3, Archives Office of New South Wales, Sydney. (manuscript). Copy courtesy of Bob Hayes.

[21] James Bonwick, *Port Phillip Settlement*, London, 1883, p.184.

[22] Stuart Duncan, 'In the steps of John Batman: a geographical excursion' (notes), Melbourne, 1988. Dr Duncan thinks Batman exaggerated distances a good deal.

[23] J.Bonwick, *Discovery and Settlement of Port Phillip*, Melbourne, 1856, p. 85.

[24] 1836 census, Public Records office, courtesy of the late George Seelaf. See also John Lack, *A History of Footscray*, p. 11, 'Half the squatters, and half the stock in Port Phillip were along the Saltwater River and Jackson's and Deep Creeks.'. There were 40,000 sheep by the time of the census, in November 1836.

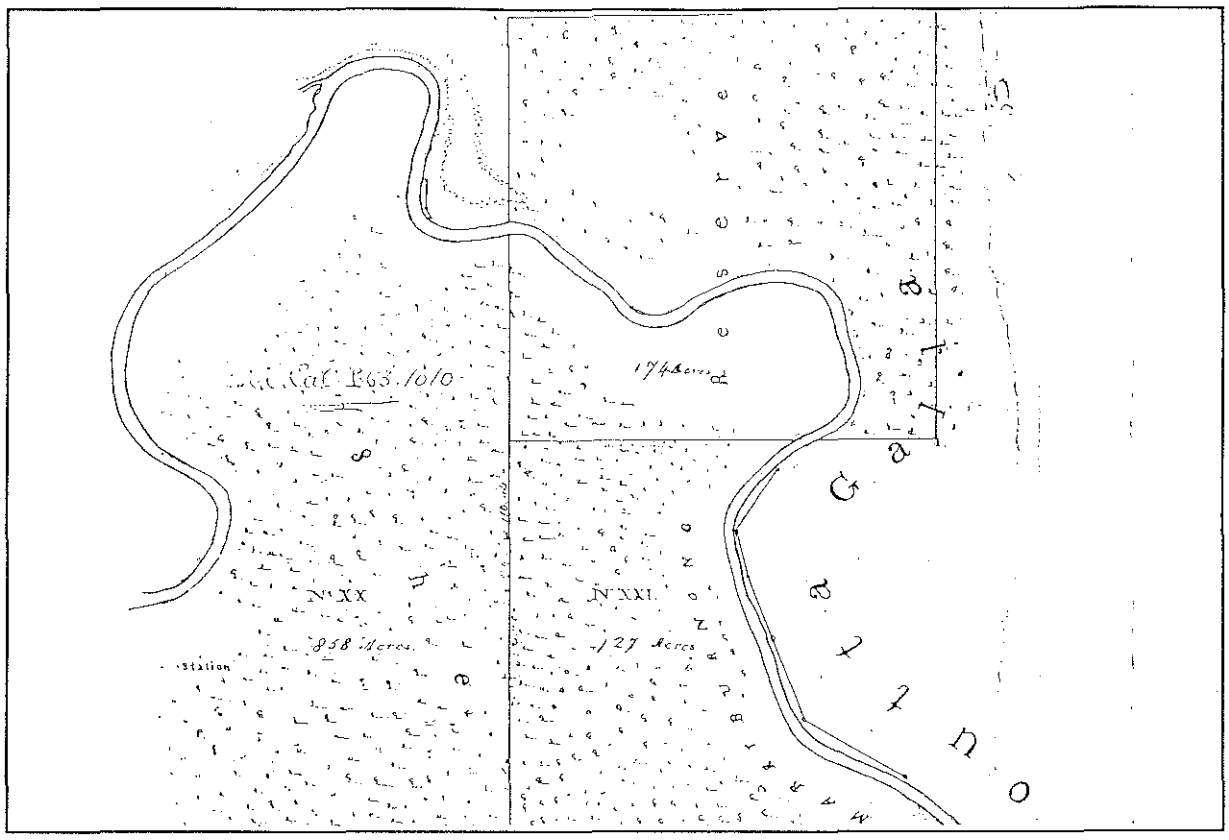

Figure 4. Hoddle's map of Maribyrnong, Section 20/21, Parish of Cut Paw Paw, 1840, Sydney, C/10.

The exact location of any building is not known but it may have been upstream from the study area, near the ford at Braybrook. It seems likely that the study area was within Cotterell's run, which, according to one source, extended from the punt (at what is now Footscray) upstream and included the Footscray-Maribyrnong area. In 1840, Cottrell sold his 'right of station' and a thousand sheep to Fortescue Arthur who had arrived that year. Arthur's household of eight people on the Saltwater River was listed in the 1841 census.[25]

The first survey of the study area occurred in 1840 when Robert Hoddle surveyed the Melbourne area. The government had divided the land into parishes and sections, the first sub-division of the area. Hoddle's map shows the study area within the parish of Cut Paw Paw (from the Aboriginal words *Koort Boork Boork,* meaning 'clump of sheoaks'), part of Section 21.[26] The map shows Maribyrnong dotted with sheoaks, except for an area immediately adjacent to the river, probably flood plain. The word 'ironstone' written on the map, immediately south of the study area, probably refers to sedimentary ferruginous rocky outcrops below the basalt, on the escarpment.

The study area changed hands when the whole of the Maribyrnong area was put up for auction under a new system of annual occupation licences on 13 September 1845. James Johnstone obtained an annual licence for 'Lot 10', being Section 21 and the adjoining reserve to its north, at a cost of £14.[27] A year later, when the annual licences were again auctioned, Johnstone obtained a licence for Section 21, at a cost of £4-13s-11d.[28] It is likely that the James Johnstone

[25] A.S.Kenyon, 'The Port Phillip Association', *Victorian Historical Magazine*, vol. 16, no.3, 1937, pp.112-113; also Kenyon Index, State Library of Victoria.

[26] Parish of Cut Paw Paw map, 1840 (Sydney C/10), Central Plans Office, Melbourne. Reproduced in Ford and Lewis, *Maribyrnong: Action in Tranquillity*, p.viii.

[27] *Port Phillip Gazette*, 13 September 1845, p.1; 27 September 1845, p.3.

[28] *Port Phillip Government Gazette*, 1846, pp, 208, 272. Solomon also obtained a further licence.

who obtained this licence was the well-known Scotsman, James Stewart Johnstone, an alderman of the city, owner of the Southern Cross Hotel and a proprietor of the *Argus* newspaper.[29]

Maribyrnong was one of the first areas of Crown land to be sold in the parish of Cut Paw Paw, except for Williamstown. The study area was part of this land sale, being within Portions 6, 7 and 8. Section 21. At the auction in October 1847, Joseph Raleigh, merchant, bought 409 acres, including Portions 6 and 7, at a cost of £1,830-4s. William Fletcher, banker, bought 300 acres of land to the south of Raleigh's lots, including Portion 8, at a cost of £1,010-1s. Johnstone bought the north-eastern part of Maribyrnong, (255 acres) at a cost of £929-0s-6d.[30]

Within Raleigh's lots there was considerable diversity of price. An analysis of the price paid for the different lots shows that the lots which included the study area (Portions 6,7 and 8) were £1.10s, £1-16s and £1-10s per acre respectively. On the other hand, lots to the north of the study area, purchased by Raleigh, ranged from £5 to £7 per acre, except for Portion 5, which was £2 per acre. The difference may relate to the different quality of soil, topography, vegetation, improvements such as fencing or buildings, or even the competitiveness of the bidding. Johnstone's and Fletcher's lots averaged £3 to £4 per acre. (see Table in Appendix F) This analysis suggests that the study area was not 'improved' at the time of Raleigh's purchase. It was only after 1847, when Joseph Raleigh bought the land, that it was developed for industrial uses. The land to the south, bought by Fletcher, developed rather differently, as a farm run by the Blair family, who leased it from Fletcher over many years. The southernmost part of the study area was in fact part of Blair's farm from the 1850s until the 1880s.

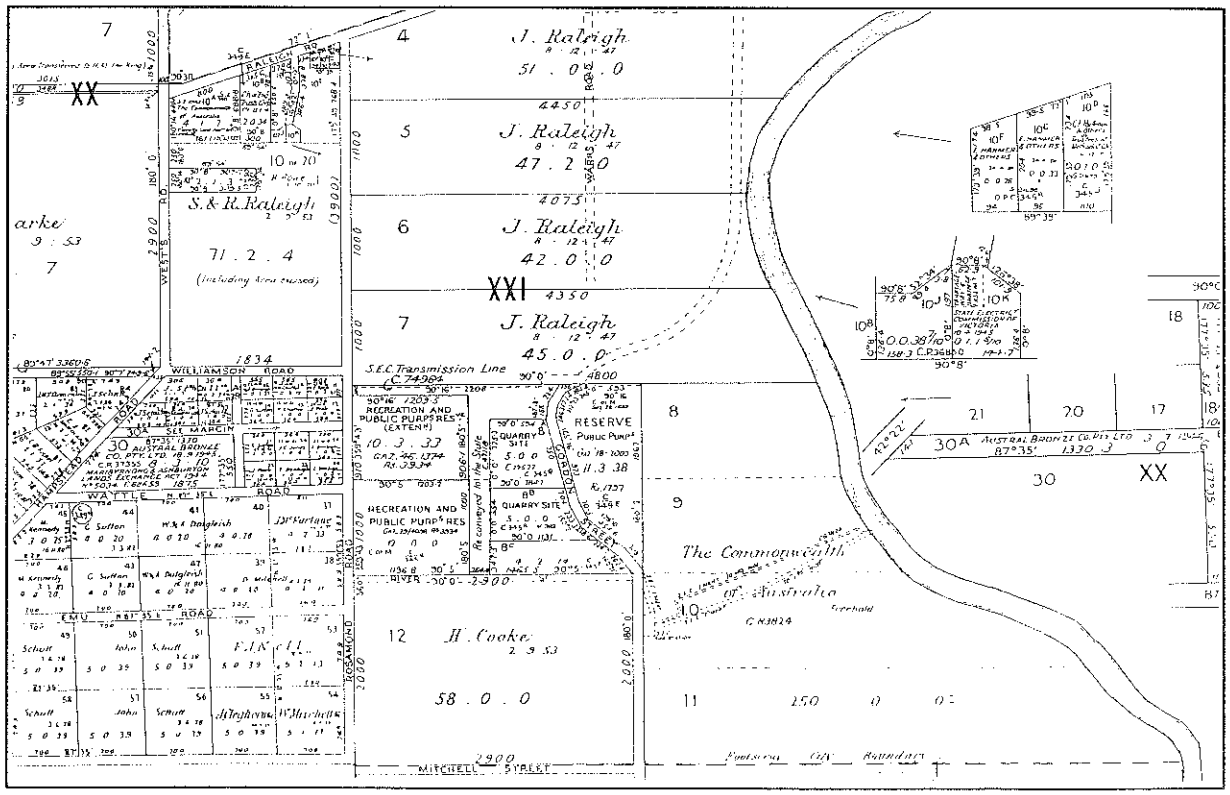

Figure 5. Crown Allotment Plan, Parish of Cut Paw Paw, County of Bourke, showing first purchasers of allotments.

[29] T.F.Bride, *Letters from Victorian Pioneers*, Melbourne 1898; republished with notes by C.E.Sayers,1969;1983 edition, pp.106, 114. See also E.Finn ('Garryowen'), *The Chronicles of Early Melbourne 1835-1852*, Melbourne 1888; facsimile edition, 1976, pp. 126, 315; *Port Phillip Almanac*, 1846, p. 96.

[30] *Port Phillip Government Gazette*, 23 October 1847; 19 January 1848. See also 'Map of the Suburban Lands of the City of Melbourne,' by Thomas Ham, 1852. State Library of Victoria. Reproduced in Ford and Lewis, *Mari byrnong: Action in Tranquillity*, p.1.

Raleigh

Joseph Raleigh was already a successful Melbourne merchant and pastoralist when he bid for the study area, and a large part of Maribyrnong, in October 1847. A cotton merchant from Manchester, England, he had arrived less than four years before at a time of severe depression in the young settlement. With him were his wife, Priscilla, and their three sons.

From 1844 to 1851 Raleigh had several large pastoral runs extending across the Port Phillip District: Noorilim on the Goulburn River, near Murchison (11,320 acres); Sutton Grange, near Harcourt (46, 200 acres); Morton Plains in the Wimmera, from 1846 (142,720 acres) as well as depasture licences in the Bourke district and the Westernport district.

Raleigh's wharf, next to Cole's wharf, was near the present Queen's Bridge, Melbourne. He had a warehouse in Flinders Street. His steamer, *Aphrasia*, plied between Melbourne and Geelong, where he also had a wool store. In what is now Yarraville, he established a boiling-down and salting works (see next section). His private residence was described as being in 'Moonee Ponds', in a house leased from Dr Robert Martin, five and a half miles from Melbourne. It is likely that this was near the Moonee Ponds Creek and that Raleigh did not live at Maribyrnong until after 1848, following the purchase of the land and the construction of a house. His wife died in 1846 and it appears that his sister, Rachel Raleigh, then managed his household.

Raleigh was a major employer of 'bounty' immigrants, some in 1844, but the majority (33) in 1849. It is likely that some of these were involved in the construction of a number of buildings on his new Maribyrnong property - a homestead; a boiling-down works in the study area (see next section); a building to accommodate his workmen, later known as 'Raleigh's castle', on the hill west of the boiling-down works; a manager's house near the works.

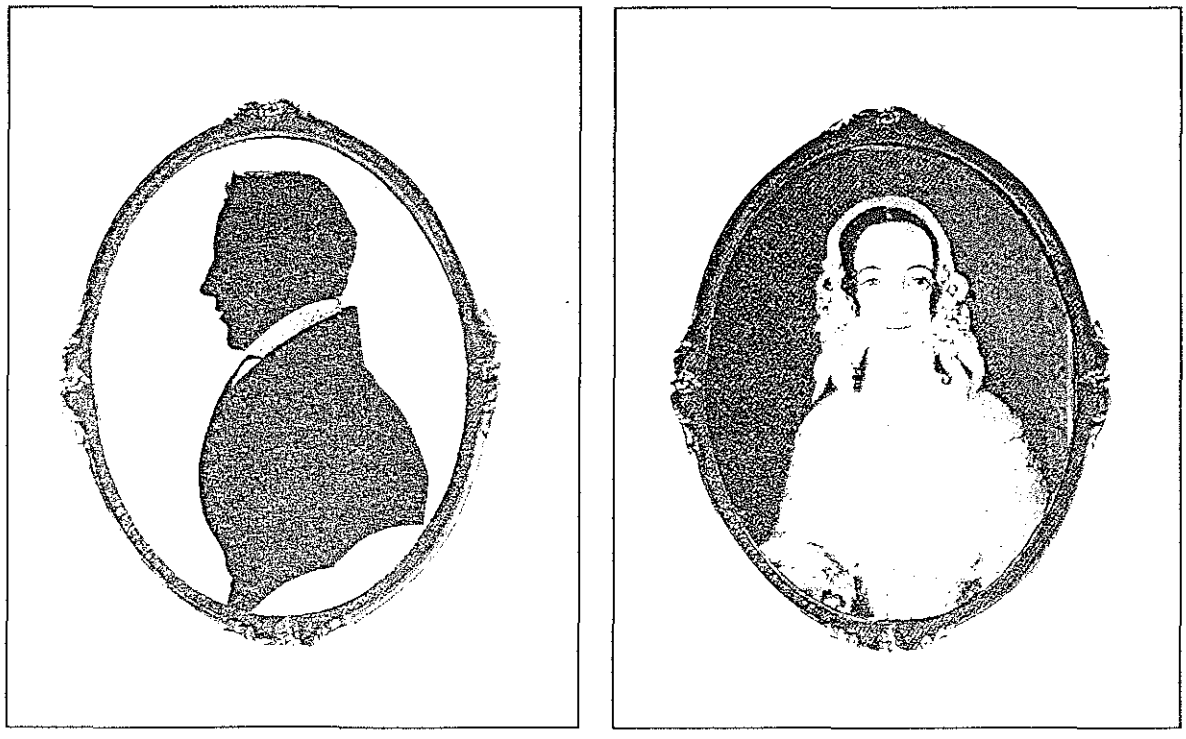

Plate 1. Joseph Raleigh, merchant and resident of Maribyrnong and his wife Priscilla.[31]

[31] La Trobe Collection State Library of Victoria.

Raleigh installed a punt across the river for private use and then extended access to the public, on payment of a toll. With the onset of the gold rushes, the punt and a track through Maribyrnong, known as 'Ballarat Road', became one of the routes to the diggings.[32]

Raleigh died suddenly, from an attack of influenza on 26 November 1852. The ships in the bay flew their colours at half-mast and some offices closed in tribute. The *Argus* described him as 'an old colonist, a merchant of considerable standing in Melbourne ... a gentleman characterised by very considerable enterprise and intelligence', whose death would create 'a gap in our commercial circles which will not easily be filled'.[33]

Boiling-down

Boiling-down of sheep carcasses involved conversion of fat into tallow, which could be used to make soap and candles. Because tallow would keep during the six month journey to Britain, it providing an additional source of export income for the Port Phillip pastoralists. Boiling-down of sheep on a large scale was an attempt to meet the problem of surplus stock and declining wool prices. It began during the depression year of 1843 and was hailed as a new discovery by the *Sydney Morning Herald*.[34] Raleigh's boiling-down works, which was one of the largest and most successful of several in Melbourne, was but part of his entrepreneurial activities. The surviving evidence of this works is an important reminder of a valuable industry at a difficult time in the history of pastoral Australia.

In the late 1840s several boiling-down works were operating in Melbourne, along both the Yarra and Saltwater Rivers. With a profitable outlet for their stock, squatters' fortunes revived. Tallow production increased considerably and from 1844 to 1850, New South Wales (including the Port Phillip District) exported 30,659 tons of tallow, equivalent to nearly four million sheep.[35] Almost a third of these total tallow exports had been from the Port Phillip District in the years 1848-50, where the value and volume of tallow exports increased enormously.[36]

Table 1: Value and volume of tallow exports from Port Phillip 1846-1851

Year	Value	Volume
1844	£ 2,000	429 tons
1848	£ 38,000	1,345 tons
1849	£100,000	
1850	£133,000	4,489 tons
1851		4,223 tons

The Rev. J. L. Bleasdale noted 'When I first landed in Melbourne, early in 1851, the boiling down of sheep and cattle for their fat was at its highest. Whole hecatombs were slaughtered at the Saltwater river for their fat alone.'[37] The Maribyrnong works were thus operating at a time when tallow exports reached their highest point in the history of the infant settlement that became Victoria in 1851.

Joseph Raleigh established his first salting and boiling-down premises below the junction of the Yarra and Maribyrnong Rivers, probably on the site of what is now Pivot Fertilisers, Yarraville.

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32 See Mrs Charles Clacy, *A Lady's Visit to the Gold Diggings of Australia*, re-printed London, 1963, p.34.

33 *Argus*, 27 November 1852, p.3.

34 Quoted by the *Portland Mercury*, 27 July 1843 and reproduced by Marnie Bassett, in *The Hentys*, London, 1954, p.511; see also Billis & Kenyon, *Pastures New*, chapter 6.

35 K.T.H.Farrer, *A Settlement Amply Supplied*, Melbourne, 1880, pp. 58-61. Farrer's estimate is 3,815,344 sheep.

36 W.Westgarth, *Victoria, late Australia Felix*, 1853, pp. 85-86; also G.J.R.Linge, *Industrial Awakening: A Geography of Australian Manufacturing 1788 to 1890*, Canberra, 1979, pp.149-152. Production in the years 1844-47 had been 11% of total Australian production over the seven years.

37 J.I.Bleasdale, in Report of Secretary of Agriculture on Meat Preserving, *VPP*, 1873, vol. 3, no.59.

An advertisement of 1845, signed by Joseph Raleigh, Agent, announced that the 'Australia Felix Salting & Melting Establishment' were prepared: 'to melt down sheep and cattle at as low rates as any boiling-down establishment, and will buy or advance on stock or the tallow. Apply to Mr Hassell, on the premises, Saltwater River.'[38] Within a year Raleigh had a substantial contract from the Van Diemen's Land government for salted beef.[39] Some historians have confused the two establishments (Yarraville and Maribyrnong) and it is important to be aware of the difference.[40]

In the absence of a specific contemporary account of Raleigh's boiling-down works at Maribyrnong, we have to depend on fragments of contemporary records; reports of other establishments at the time; later documentary evidence and our own analysis of pictorial and map information and the surviving fabric in the study area. Even the date of commencement of the Maribyrnong boiling-down works is uncertain, but was possibly 1848-49. A newspaper account of 1854 refers to it as 'a well-known boiling-down establishment, in which thousands of sheep and cattle were slaughtered to be converted into tallow'.[41]

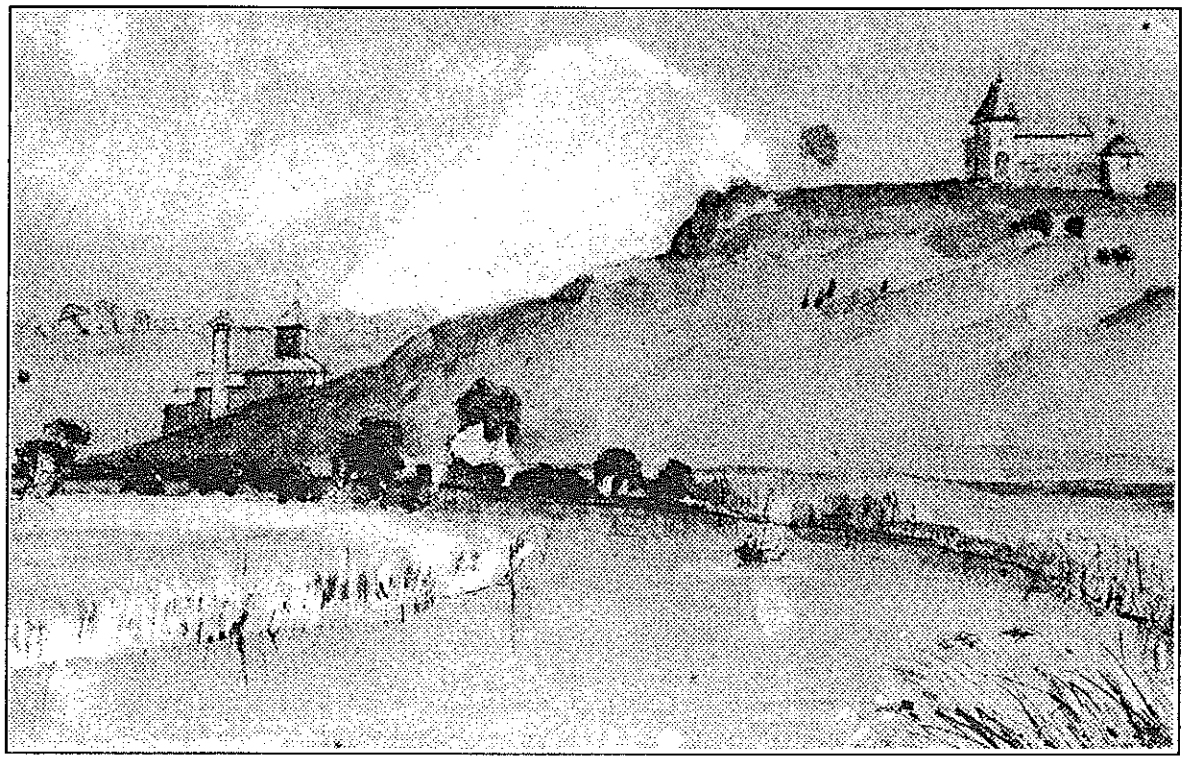

Plate 2. Malakoff's Castle on the Saltwater River, by Greeves. c1855.[42]

[38] *Port Phillip Gazette*, 1 March 1845, p.3; also 30 April 1845, which describes Watson & Wight's boiling-down establishment and refers to two other boiling establishments, one 'at the junction of the Saltwater River, which belongs to Mr Raleigh'. See also John Lack, *A History of Footscray*, pp.32-35. Dr. Lack describes the growth in boiling-down as the Port Phillip District's 'first large-scale secondary industry'. He refers to Raleigh's works below the river junction, noting that Raleigh leased this land early in 1845 and the works flourished into the early 1850s. According to *Footscray's First Hundred Years*, 1959, Raleigh's boiling-down establishment occupied 13 acres in Yarraville, a site which later became the Cuming Smith works.

[39] *Port Phillip Patriot*, 10 August, 27 August 1846.

[40] See A. Gross, 'Maribyrnong', in *Victorian Historical Magazine*, vol. XXII, no.2, Sept.1947, pp.49-66; also C. Kellaway, 'Research into the Melbourne Meat Preserving Company buildings, Maribyrnong', National Trust, 1980, file no. 4730.

[41] *Argus*, 11 August 1854.

[42] *Watercolour believed to be by Adolphus Greeves, c1850, La Trobe Collection, State Library of Victoria.*

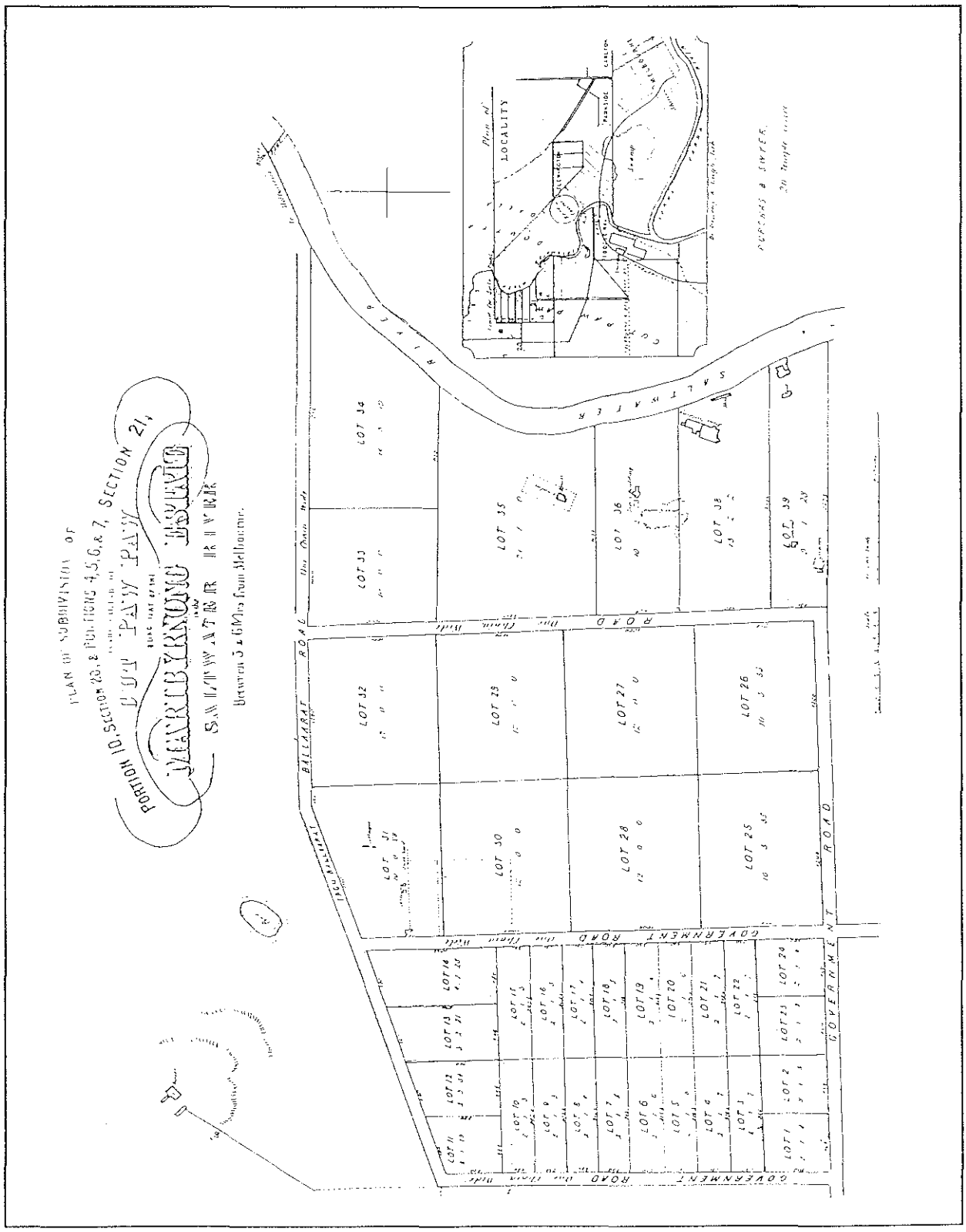

Figure 6. Plan of proposed subdivision ... Parish of Cut Paw Paw , c.1857-8. [43]

[43] Plan of subdivision of Portion 10, Section 20, and Portions 4,5,6, and 7 in the Parish of Cut Paw Paw, in the Vale Collection, La Trobe Collection, State Library of Victoria, no date. However, Purchas and Swyer were operating between 1857 and 1861. Titles Office information indicates that the land was sold in 1858.

A plan of 1858 shows that the buildings were of stone and on the banks of the Maribyrnong River.[44] The same plan shows two quarries, which probably were the source of the stone. A water colour by Greeves shows substantial buildings with a chimney, by the river, and a building with a tower on the hill. The latter is obviously the 'castle' later known as 'Raleigh's castle. The buildings by the river closely resemble the central part of the later meat cannery depicted in etchings of 1868 and 1873. The main difference is that the water colour shows a tower, which is absent from the later prints and photographs.

Two pieces of evidence show that one of Raleigh's boiling down works, possibly the establishment at Maribyrnong, became known as 'the Victoria Works'. Firstly, a notice in the Port Phillip Government Gazette announced the dissolution of the partnership 'hitherto subsisting between the undersigned trading under the firm of Hassell, Fyffe and Co. in the establishment known as the Victoria Works on the Salt Water River, near Melbourne', but would continue under the name of Raleigh, Fyffe & Co.[45] Secondly, the Port Phillip Almanac for 1851 refers to 'Raleigh, Fyffe and Co. stock-melters & beef curers, Victoria Works, Salt Water River, office in Melbourne wharf'. The firm of Raleigh, Fyffe & Co. won gold medals at the Victorian Industrial Society's exhibition in 1851 for 'best cask of mutton tallow' and 'best cask of beef tallow' and a silver medal for 'best tallow candles'. The firm also showed some 'primary tierced beef' at the exhibition, as did the rival firm, Watson & Wight.[46] A year later, Raleigh announced that the partnership of Raleigh Fyffe & Co., carried on 'at the Salt Water River, near Melbourne' was dissolved.[47]

A number of contemporary accounts describe the boiling-down process at other establishments. Griffith, writing in 1845, describes a wooden boiler, 'strongly clamped with iron', into which steam is then let by a pipe constructed for the purpose. These were probably wood stave construction vats with coiled pipe inside, through which steam ran.

> *After a few hours, the tallow is run off into casks, through another pipe leading from the bottom of the boiler. The refuse which remains in the boiler is placed in a screw press and subjected to high pressure until all the tallow has been squeezed out. This is then put into an iron boiler and refined previous to being put into casks. The wool is stripped off the skins, washed and packed for exportation. The trotters are boiled for their oil. and the bones are exported to make hafts for knives.*[48]

Another account describes how the sheep were stunned and their heads chopped off. The carcasses were hung on hooks by their hind legs, skinned and 'viscerated'.

> *The entrails were sent down below through a trap-door to the gutmen to take off the fat. From 20 to 30 carcases thus gutted were then placed on a truck working on a tramway and taken to another higher floor called the boiler platform. Here two large iron boilers were fixed standing on their ends, with man-holes at the top, and capable of holding from 500 to 600 carcases packed and wedged close together, by a man placed inside the boiler for that purpose.* [49]

Steam was generated by means of two other boilers fixed at some distance from the carcase boilers, the steam being conveyed by pipes from the former to the latter.

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[44] Plan of subdivision of Portion 10, Section 20, and Portions 4,5,6, and 7 in the Parish of Cut Paw Paw, in the Vale Collection, La Trobe Collection, State Library of Victoria, c1857-8.

[45] *Port Phillip Government Gazette*, 1850, p.486.

[46] 'E.Finn ('Garryowen'), *The Chronicles of Early Melbourne*, facsimile edition, pp. 433-434.

[47] *Port Phillip Government Gazette*, 20 October 1852, p.1174.

[48] Charles Griffiths, *Present State and Prospects of the Port Phillip District of New South Wales*, Dublin, 1845.

[49] James Bonwick, *Romance of the Wool Trade*, London, 1887.

The industry provided work for many trades, The use of cast iron refining pans and boilers, as well as pipes and pumps, gave work to local foundries and tinsmiths. By 1846, Langlands were turning out the first steam engines in the colony. The tall brick chimneys created work for brickmakers. Coopers were in demand. The work involved in the movement of fuel, casks, tallow, skins and hides, stimulated the transport industry and employed numbers of people. Tallow itself provided the raw material for soap and candles and factories making these products were in operation from the 1840s.[50] The study area was thus an important link in a chain of production.

It appears that Joseph Raleigh was in the forefront of this increasing economic activity, for he was one of the largest 'importers' of labour and many immigrants from a range of skilled trades, were assigned to him on arrival. Some worked on his construction projects. Others worked at his boiling-down works. A murder case at Flemington in August 1849 throws light on some of the men who were employed by Raleigh at the Saltwater River. These included the victim's brother, four suspects and one key witness. The suspects had not been sober and had been seen with the victim, but there was insufficient evidence for a conviction and the case remained an unsolved mystery.[51]

The character of some of Raleigh's workers is indicated by another of his employees, John Chandler, who later recalled his experience of working at Raleigh's works, very possibly the establishment at Maribyrnong. It was in 1851 and he was thirteen years old at the time.

> *I got a situation on the Saltwater River. I had to mind and feed about 600 pigs at Raleigh's boiling down place. They were fed upon the refuse of the boiling-down. It was a very dirty job. They used to sell legs of mutton at 6d each. I was also picking peas here for the overseer for some time. I saw a diamond snake killed, nine feet long. They are very venomous. I was glad to get away from this place, as they were a very bad lot of men. I used to shudder when I heard them take the name of God so often in vain.* [52]

The position of the boiling-down works on the banks of the river was an important factor in its location. Transport by water was cheaper and the river was a convenient drain. Raleigh's punt, just upstream, was an important link.[53] It was probably the gold rushes that brought an end to the boiling down works, for the population increased seven fold, stock prices and the cost of labour rose and boiling-down ceased to be the profitable activity it had once been.

Robertson, Martin and Smith

One of the most unusual episodes in the study area's history is its association with the firm of Robertson, Martin and Smith, at the time that they were involved in constructing Australia's first orthodox locomotive. This was in 1854, when Australia's first steam railway, the Melbourne & Hobson's Bay Railway, was opened, with a steam engine of local manufacture. The firm selected to build the locomotive was that of Robertson, Martin & Smith, after the locomotives ordered from England were delayed. The firm also built and adapted a portable 4 horse-power pile-driver engine, fixed on a truck, which was used in the construction of the railway, to haul ballast wagons, rails, sleepers and other materials along the track, as progress

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[50] G.D.R. Linge, *Industrial Awakening*, p.112. See also Gary Vines, *Meat and By-products*, Melbourne, 1994.

[51] Lenore Frost, *Murder & Misfortune on the Mount Alexander Road*, Melbourne, 1995, pp.26-34. The suspects included Robert Davis, David Temple, James Harrington and William Westwood, who had come out in June 1849 , on the 'Whitby', and had been assigned to Raleigh. William Virtue, a witness, had arrived in April 1849 on the 'General Palmer', The victim was William Sams Davis, whose brother worked for Raleigh.

[52] John Chandler, *Forty Years in the Wilderness*, Victoria, 1893, pp. 21-22. J.Lack cites part of this account of working at Raleigh's boiling down establishment, which he points out was 'possibly at the river junction, possibly at Maribyrnong'. (Lack, p. 44)

[53] See Ford and Lewis, *Maribyrnong: Action in Tranquillity*, pp. 4-6.

was made.[54] The firm of Langlands made the boiler at their Port Phillip Foundry. The whole job was finished in the record time of ten weeks, culminating in a successful official trial on 12 September 1854, carrying Governor Charles Hotham and prominent citizens, in handsomely painted imported carriages. According to the *Argus*, 'the locomotive was 'the first locomotive constructed, not merely in Victoria but in the Southern Hemisphere'.[55] An open third class carriage, next to the locomotive, carried the band of the 40th regiment. This carriage was also the work of the Robertson, Martin & Smith firm. The *Melbourne Morning Herald* reported that the engine 'behaved very well indeed'.

The significance of the event was reflected in the speeches at a banquet held in the engine shed at Sandridge, after the outward journey. Contemporary newspaper reports give some idea of the uniqueness of the occasion and the excitement that the new engine had generated. The makers of the engine received much praise for their achievement. The Colonial Secretary declared that this was 'a new age in Australia, an iron age'. It was the opening of 'the first railway in the third colony of Great Britain and the second south of the line.' His Excellency, Sir Charles, remarked that: 'a good example of colonial manufacture had been set by the makers of the engine used that day'. The chairman also stressed that the engine was totally of colonial manufacture'.[56] The engineer to the Hobson's Bay Company, James Moore, who may have produced the designs for the Robertson, Martin & Smith engine, proposed a toast to the contractors. Robertson, in turn, proposed the health of 'The Working Men'.

At the same time as the Robertson, Martin & Smith firm were building the pioneer engine, they were also extending their works to the study area. Evidence for this comes from accounts in contemporary newspapers. The *Argus* of 11 August 1854 reported in detail on the engineering establishment of Robertson, Martin and Smith, on the site of a well-known boiling-down establishment.[57] A later report in the *Argus* provides information as to the location of the premises of Robertson, Martin & Smith, two and a quarter miles (or 3.6 kilometres) above the junction of the rivers.[58]

In the Melbourne Directory of 1854, the firm of Robertson. Martin & Smith are listed as 'Ironfounders' at 200, Little Collins Street East. The Melbourne Morning Herald reported on the trial run of the pioneer steam locomotive and referred to the firm's extension of activity to the Saltwater River. The article mentioned that the firm, which was described as a new firm, 'laboured under many disadvantages, of which the cramped space where their operations are temporarily carried on was not one of the least'. It is possible that the study area was used for manufacturing parts of the locomotive, for example large castings, but the following account demonstrates that the locomotive was constructed, in whole or in part, in Melbourne.

> *Considerable difficulty was experienced in getting the monster from the yard when it was built to the railway station. The labour was accomplished in the quiet of the night by laying rails down temporarily and pushing it along them. Owing to the sharp corners that had to be passed, and the difficulties of poising so heavy a mass to slue it round, more than a whole night was occupied in the transit. The engine is now on the line ready for action.*[59]

This report is significant for it seems to make clear that the engine was not built at the new works on the Saltwater River. However, the works were evidently in operation and it is possible that parts for the new engine were made at the new site and shipped down by river. Encouraged

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[54] M.J.Murray, 'Early Victorian Railways', *Victorian Historical Magazine*, vol.6, 1917-18, p.98; *Argus*, 1 June 1854, p.5; 3 June 1854, p.5; 21 September 1854, p.5.

[55] *Argus*, 13 September 1854, p.3.

[56] *Melbourne Morning Herald*, 13 September 1854.

[57] *Argus*, 11 August 1854, p.5.

[58] *Argus*, 28 September 1854, p.5.

[59] *Melbourne Morning Herald*, 11 September 1854, p.5. This article also suggests that 'previously existing establishments seem to have been actuated by a jealousy of the new concern that has thus made a bid to cut them out the latter having been stimulated to increased activity and self-reliance by the unwillingness of its older neighbours to co-operate with them.'

by the initial success of their entry into locomotive manufacturing, Robertson, Martin and Smith were clearly gearing up for anticipated orders. The Robertson, Martin & Smith firm probably leased the site from Raleigh's trustees, for the land did not change hands until 1858.

The locomotive soon ran into difficulties when the engine's crank axle fractured, on two occasions. The original interim 4 h.p. ballast engine, also built by Robertson, Martin and Smith, was used until the locomotive was repaired.[60] However, on 1 December the crank smashed into pieces and the company ceased all services until further notice. By this time two locomotives had arrived from England and were in use by 25 December 1854.[61]

The evidence of two marriage certificates indicates that the Roberston, Martin and Smith firm were still operating on the Saltwater River in late 1854 and the first part of 1855. William Smith, engineer, married Sarah Ann Murell in November 1854 at the 'Victoria Iron Works, Saltwater River, near Melbourne'. The address of bride and groom was given as 'Saltwater River'. William was from Scotland, Sarah was from England. William Robertson was one of the witnesses, as was William Smith's father, a blacksmith. The following year, in August 1855, Sarah Ann Smith had a daughter born at Maribyrnong. In March 1855, Hugh McKissock, quarryman, married Margaret Darling, servant, at the 'Victorian Iron Works'.[62] Evidently there was a small community living within the vicinity of the works. This is borne out by an application from the Dean of Melbourne for a grant of £300 towards the building of a school at Raleigh's Punt. The application was sent in June 1855.[63]

Business was probably not going too well for the engineering firm and in July 1855, Robertson, Martin & Smith announced the dissolution of their partnership.

> *The partnership hitherto existing between us, under the firm of 'Robertson, Martin & Smith, engineers and contractors', of which we the undersigned are sole partners, is this day, by mutual consent dissolved. All debts due by or to the late firm will be paid or received by the undersigned William Robertson.*
>
> *Melbourne, 10th July 1855*
>
> *Wm. Robertson*
> *John Martin*
> *Wm. Smith*[64]

It is possible that the earliest known illustration of the study area, a water colour of the site, by 'Greeves', relates to the 1854 iron works period rather than the early boiling down works period.[65] The artist, 'Greeves', may well have been Dr Adolphous Greeves, a director of the Hobson's Bay Company. The drawing has the title 'Malakoff's castle on the Saltwater River'. The castle is on the right hand side of the drawing. The name 'Malakoff' comes from a famous siege in the Crimean War, when the allies attacked the main defences of Sebastopol. The French finally captured the great Malakov fortress from the Russians on 9 September 1855, a notable victory.[66]

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[60] *Argus*, 21 September 1854, p.5. A bend in the track was said to have contributed to the problem. See also *Argus*, 12 October, 15 November 1854.

[61] Railways Historical Society publication supplied courtesy of Ron Hodges; *Argus*, 13 December 1854, p.5; 26 December 1854. James Moore, engineer to the Hobson's Bay Company, was dismissed.

[62] Marriage certificate of Sarah Ann Murell and William Smith, no. 3359, 1854; marriage certificate of Hugh McKissock and Margaret Darling, no. 619, 1 March 1855. When Hugh McKissock died his place of marriage was given as 'Maribyrnong'. When Sarah Ann Smith was born, the place of her parents' marriage was given as 'Maribyrnong'.

[63] VPRS 61, 28 June 1855, correspondence relating to Raleigh's Punt Church of England School. It was some time before aid was available (June 1856) and then only towards a master's salary and fixtures.

[64] *Victorian Government Gazette*, 24 July 1855, no.70, p.1709. The evidence of birth cerificates indicates that by 1857 William Smith and his family were living at Mount Blackwood.

[65] The illustration is in the La Trobe Collection, State Library of Victoria. It was used for the cover of the book by E.Popp, *Glimpses of Early Sunshine*, Melbourne 1979.

[66] R.W.Seton-Watson, *Britain in Europe 1789-1914*, Cambridge, 1945, p.341.

A sub-division plan of 1857-8 gives some idea of the study area shortly after it was used by Robertson, Martin & Smith.[67] There were two substantial stone buildings, adjoining each other; two sizeable sheds by the river and one shed further south, near a pond. These would all have been within the study area. On the hill above the study area was a large quarry and a stone building, clearly Raleigh's or Malakoff's castle. Other features were a smaller quarry and a school west of the pond, near a government road; a house and sizeable garden to the north of the study area, in the vicinity of Hillside Crescent; cottages and a stockyard south of the road described as 'Ballarat Road'(now known as 'Raleigh Road'); a punt over the river with house nearby. About this time the punt was considerably improved and a hotel opened, known as Raleigh's Punt Hotel. Comparison of map overlays suggests that the school was located between the present Koorie Gardening Team compound. and Van Ness Avenue. The school may have been the 'Raleigh's Punt Church of England School', which received Government aid for six months in 1856, operating in a rented building and paying rent of 20 shillings a week. [68]

The episode of the Victoria Iron Works was brief, but of considerable importance in the site's history, linking it, however tenuously, to an event of national importance: the construction and opening of Australia's first railway and the building of Australia' s first orthodox locomotive.[69] The factory's location by the river was no doubt a key factor in its choice by the engineering firm, Robertson, Martin & Smith, as well as the existence of substantial buildings. Apart from some foundry 'slag', no archaeological evidence has yet been found that throws light on this aspect of the study area's history. The two sheds in the plan of 1858 have gone, but portions of the stone buildings, either foundations or the back walls, may still remain. Detailed archaeological excavation could make a useful contribution to our knowledge of this era.

The iron works episode is also significant because it provides some sense of the social dimension of an industrial operation, the beginnings of a small local settlement with families and a school. However, it was short-lived and Maribyrnong in 1856 had 'a very fluctuating population ... chiefly labourers dependent on the work at stone quarries'.[70]

Transition

A change in ownership of the study area seems to have occurred in 1858 when Sarah and Rachel Raleigh sold Portions 6 and 7 to Henry William Dauglish, who was in fact a business partner of their young nephews. Five years previously the Raleigh sisters had extended the estate by purchasing the adjoining land in Portion 10, Section 20. About this time the area was subdivided and advertised for sale, but the sub-division does not appear to have gone ahead.[71]
Early in 1859, Dauglish apparently mortgaged the property, but some financial problem developed and by 1862 the property was owned by Messrs Gurney, Chapman and Birbeck.[72]
Meanwhile, the three Raleigh sons were in England but returned to Australia about 1860 'owing to misfortunes overtaking the family'. These seem to have included financial misfortunes.[73]
Rachel Raleigh died in 1860 and her sister Sarah died the following year. They were Quakers

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[67] Vale Collection, State Library of Victoria, reproduced in Ford & Lewis, *Maribyrnong: Action in Tanquillity*, p.10. The firm, Purchas & Swyer drew the plan.

[68] VPRS 61, 56/634, 7June 1856; 56/843, 29 June 1856; correspondence relating to Raleigh's Punt Church of England School. Government aid only lasted from June 1856 to December 1856. However, 20 children were enrolled at this time, with an average attendance of 14. Edward Hamilton was the master and initially had to provide desks, forms, a table and chair, out of his own money. Parents paid a total of £12-12s in school fees during this time. The Government aid was towards the master's salary and there was also, eventually, a grant for half of the rent.

[69] A leader article in the *Argus*, 'The First Scream', on the day the Melbourne & Hobson's Bay line opened, indicates the momentous nature of the event. (*Argus*, 12 September 1854, p.4.)

[70] VPRS 61, 56/1266, Rev. E.Puckle.

[71] Vale Collection, State Library of Victoria

[72] Titles Office information.

[73] *The Pastoralists' Review*, 15 May 1902, p.151, obituary for Joseph Raleigh (junior). This indicates that Joseph Raleigh and his brothers 'entered into pastoral pursuits with the remains of their fortune'.

and active business women but their lives ended in sad circumstances. By 1862 the whole of the estate had passed out of the hands of the Raleigh family and the Raleigh brothers left Melbourne. John and Joseph Raleigh bought a property near Bendigo, while William Raleigh bought a property on the Darling River. Years later, William and Joseph Raleigh returned to Melbourne.

It is possible that the study area was part of a farm leased by William Cameron from 'Raleigh's Trustees' from 1866 to 1867, as recorded in the Braybrook Road District ratebooks. By 1868, George Petty was the owner and was leasing the property to the Melbourne Meat Preserving Company. He had also purchased a substantial part of the former Raleigh estate from Charles B. Fisher and the property formerly owned by James Johnstone.

2.5 The Meat Preserving Industries

Melbourne Meat Preserving Company 1868-1873

Further sheep gluts and falling prices in the late 1860s, and a shortage of meat in England, provided the circumstances which led to the development of the meat preserving industry in Australia and a flourishing export trade for some years. The study area was to play a major part in this trade.

Meat preserving technology had been developed many years before, initially through the pioneering work of Nicholas Appert in France by 1810. The significance of food preserving, in the words of K.T.H. Farrer, was that it developed the means of transporting 'the plenty of this place to the want of that'. It was 'a technology which could bridge time and space.' [74] Appert preserved a range of food in glass. His methods were taken up and developed in Britain, using metal canisters, since Britain had resources of iron, steel and tin and was developing large-scale production of tin-plate.

A British canner, Peter Durand, took out a patent in 1810 and a number of firms were supplying canned meat to the British navy during the next few years. In 1817 an Englishman began preserving food in glass in America. British, European and American canners were at work in the 1820s onwards, improving processes. The timing of final sealing, the use of brine baths and testing of the cans were issues worked on during this time. Following scandals of putrefied canned meat, a Select Committee on Preserved Meats in Britain investigated the meat preserving industry. It found that 'blown' cans were more likely in tins above the six-pound size.

Canning in Australia began in the late 1840s in New South Wales, through the work of Sizar Elliot who first exhibited his preserved meats in 1846. He did not continue beyond 1848, but the Dangar brothers at Newcastle developed large-scale meat canning works, which were in operation that year and successfully exported thousands of tins of meat, mainly beef, over the next seven years.[75] In 1866 a meat cannery began operating at Ramornie in New South Wales, under Tindal. The food technologists employed by both Tindal and the Dangar brothers had trained in London, probably by the firm of Samuel Sextus Ritchie and John McCall, who had won awards in their own right for canned meat, at the Great Exhibition in London in 1851.

Ritchie came to Australia in 1857 and was in business as a wine and spirit merchant. Early in 1867 he began experiments in Melbourne to demonstrate the feasibility of canning meat in Victoria. Demonstrations of his samples led to a public meeting of leading business men and squatters to consider the formation of a company for preserving meat and shipping it to England. Attending were merchants such as James White; graziers such as John Hughes, George Fairbairn and Hugh Glass; William Sloane, commission agent; Hastings Cunningham, wool broker; also stock and station agents. [See appendix on the company's directors and shareholders].

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[74] K.T.H.Farrer, *A Settlement Amply Supplied: Food Technology in Nineteenth Century Australia*, Melbourne, 1980, p. 4. Appert began his experiments in 1794 and published a book on his work in 1810. Farrer cites '13 tins of Dutch salmon' produced in 1797 as evidence that 'a canning industry of sorts was developing in Holland independently of Appert'.

[75] Farrer, pp. 65-78. The gold rushes affected local costs and the Newcastle works closed in 1855.

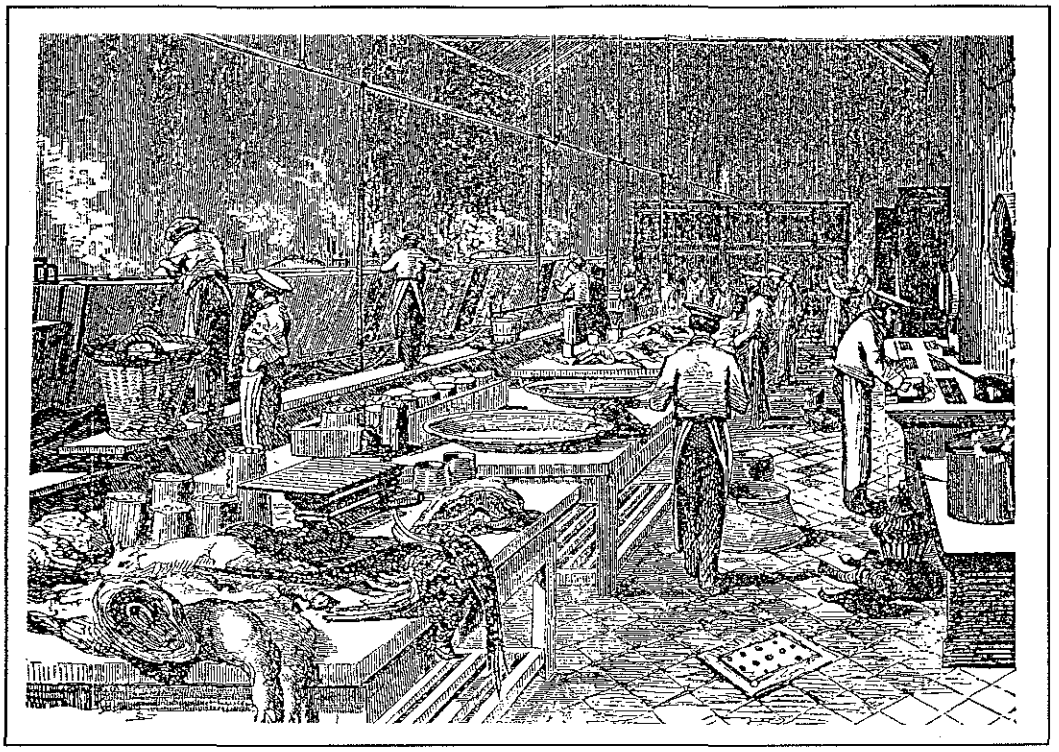

Plate 3. Meat cannery at Houndsditch , England, 1852, in which Ritchie was a partner.[76]

The scheme's promoters forecast a large market in England and emphasised the need for 'a better solution than boiling down for the surplus stock problem'.[77] The meeting supported the scheme, appointed a committee and the Melbourne Meat Preserving Company was accordingly formed. Samuel Sextus Ritchie was appointed manager not long afterwards.

In May 1868 the new Melbourne Meat Preserving Company obtained a lease of 170 acres from George Petty with the right of purchase. Rent was to be £200 per annum. Several sources provide evidence of the location of the new meat preserving establishment , especially title deeds and ratebook entries. A number of contemporary newspaper reports refer to the company's use of Raleigh's former boiling-down works.

> *No time was lost in endeavouring to secure a suitable site for the company's future operations, and this was ultimately fixed at Maribyrnong, on the Saltwater River, a lease having been obtained of a portion of the estate formerly occupied by the late Mr. Raleigh as a boiling-down establishment and consisting of about one hundred and seventy acres.*[78]

The situation was especially suitable for the company's operations. The site was within easy distance of the Newmarket saleyards and within a few miles of the city by land. It was on the banks of a navigable river, with the possibility of 'water communication from its gates to the shipping in Hobson's Bay'.[79] There were grasslands around the works for the stock. Extra pasturage was obtained by leasing another 4000 acres in what is now West Sunshine.

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[76] T.K. Derry & T.I. Williams, *A Short History of Technology from the Earliest times to A.D. 1900.*, Oxford 1960.: p.697.

[77] E.A.Beever, 'A History of the Australian Meat Export Trade, 1865-1939'. Ph.D. thesis, University of Melbourne, 1967, p. 8. See also *Age* and *Argus*, 31 December 1867.

[78] *Argus*, 6 October 1868, p.6.

[79] *Argus*, 6 October 1874, p.6.

Access across the river was by Raleigh's Punt, a pontoon bridge, but work soon began on a substantial bridge, funded both by the company and by central and local government.[80] Road access needed improving and the company built new roads including one 'off to the left', after Raleigh's Punt. Some of their expenditure on roads was later refunded by government subsidies. Water was also needed and the company's engineer, Albert Purchas, connected the factory to the Yan Yean main by bringing the water two miles in two inch pipes from Flemington. This involved laying a Yan Yean main across the Saltwater River, on the river bed.[81]

The company's manager, S.S. Ritchie, had clear ideas on what was needed for the new venture. He later said that one of the greatest difficulties he had in starting the company was to find a proper site.[82] The builder engaged to work on the site was John Pigdon and the architect Albert Purchas. Samuel Sextus Ritchie was an experienced meat preserver, with ten years experience in England and Europe. However, the meat canning enterprise was an ambitious scheme. Operations began at the end of September 1868.[83]

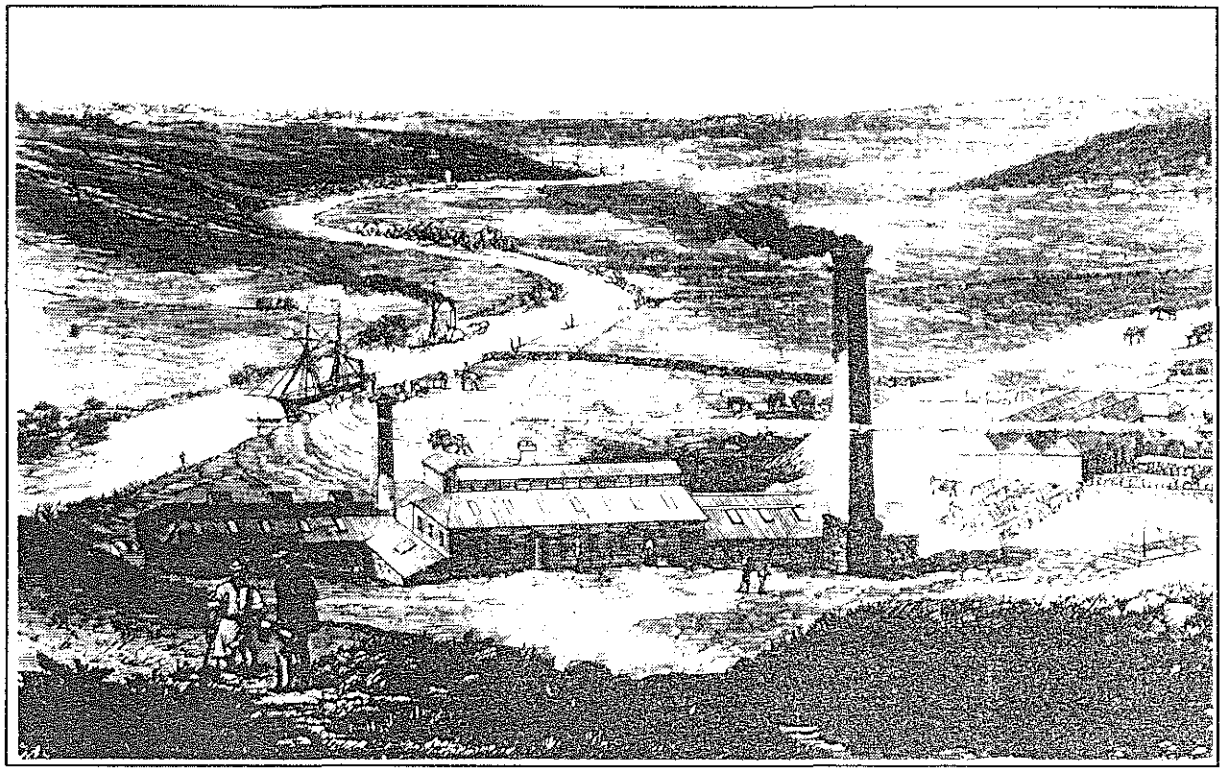

Plate 4. Melbourne Meat Preserving Company's works on the Saltwater River, 1868.[84]

Five substantial articles on the factory appeared in newspapers between 1868 and 1873 and these, combined together, make it possible to follow the process of production through the different departments of the factory, in its first two years of operation. In most cases, though not all, it is possible to identify the location of the department and it is also possible to gain some idea of which buildings were newly constructed by the company and which were adapted from the old boiling down works.

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[80] Argus, 26 February 1870. The bridge cost £1,500. £700 of this was subscribed by Government ,the rest by the company with assistance from 'the local bodies'.

[81] *Argus*, 2 October 1868, p.4.

[82] *Victorian Parliamentary Papers*, 1870, vol.2 (2nd session), no.22, Progress Report of the Royal Commission on Noxious Trades, evidence of S.S. Ritchie, p.59.

[83] *Argus*, 6 October 1868, p.6.

[84] Illustrated Australian News, 5 October 1868. La Trobe Collection, State Library of Victoria.

One newspaper article pointed out that 'the buildings, being on the side of a hill, are advantageously arranged in stages'. Tramways connected the various departments of the factory and ran 'hither and thither'. Wharves were a key feature of the site and appear in contemporary illustrations and photographs.[85]

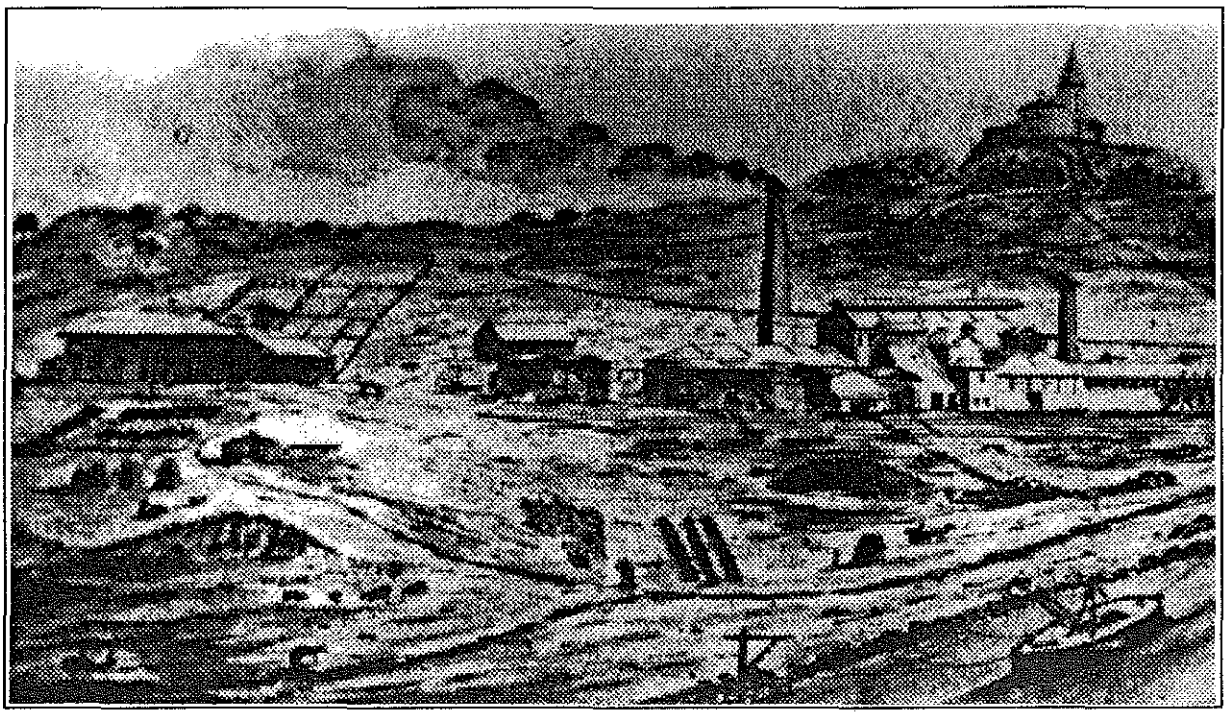

Plate 5. Melbourne Meat Preserving Co. Maribyrnong, 1868.[86]

Stock pens and slaughterhouse were at the south end of the study area on higher ground, while the various processes of manufacture were concentrated in the main buildings nearer the river. These included tinsmiths' shop, boning room, kitchen, preserving department, cooling room, testing rooms, packing department, boiling-down department, stores, bone mill, and machine shop. A flow chart by K.T.H. Farrer indicates the highly-organised and well-planned nature of this meat cannery's operations.

Other buildings included store rooms, offices, stables and, in 1870, a restaurant, 'provided on the ground for the use of the men'. A garden was included in the overall plan and in 1868, eight acres of land, 'on a fine alluvial flat', were being cultivated, to supply pot herbs and vegetables for use in soups and stews. By 1870, Ritchie was using onions and spices as flavouring for meats such as rabbit, which was canned on a limited scale. The location of this vegetable garden was probably just outside the study area, towards Burton Crescent. A large holding paddock of several thousand acres was leased from Francis Anderson, grazier, in what is now West Sunshine, and stock stayed here briefly before coming in to be slaughtered.

Accommodation for single and casual workers was available in the Castle Hotel, above the works. This later became unlicensed but continued as a lodging house. The company village of 12 stone cottages had a high turnover of occupants, but some skilled workers and their families did stay there over a period of years. The company also tried a sub-division and land sale scheme, in an effort to encourage a resident population who owned their own land and homes. This was in Portion 10, Section 20, and was known as 'Hampstead'. A number of employees did purchase allotments, but only about six managed to build houses.

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[85] *Argus*, 26 February 1870.

[86] La TrobeCollection State Library of Victoria. (photograph of charcoal drawing, artist unknown)

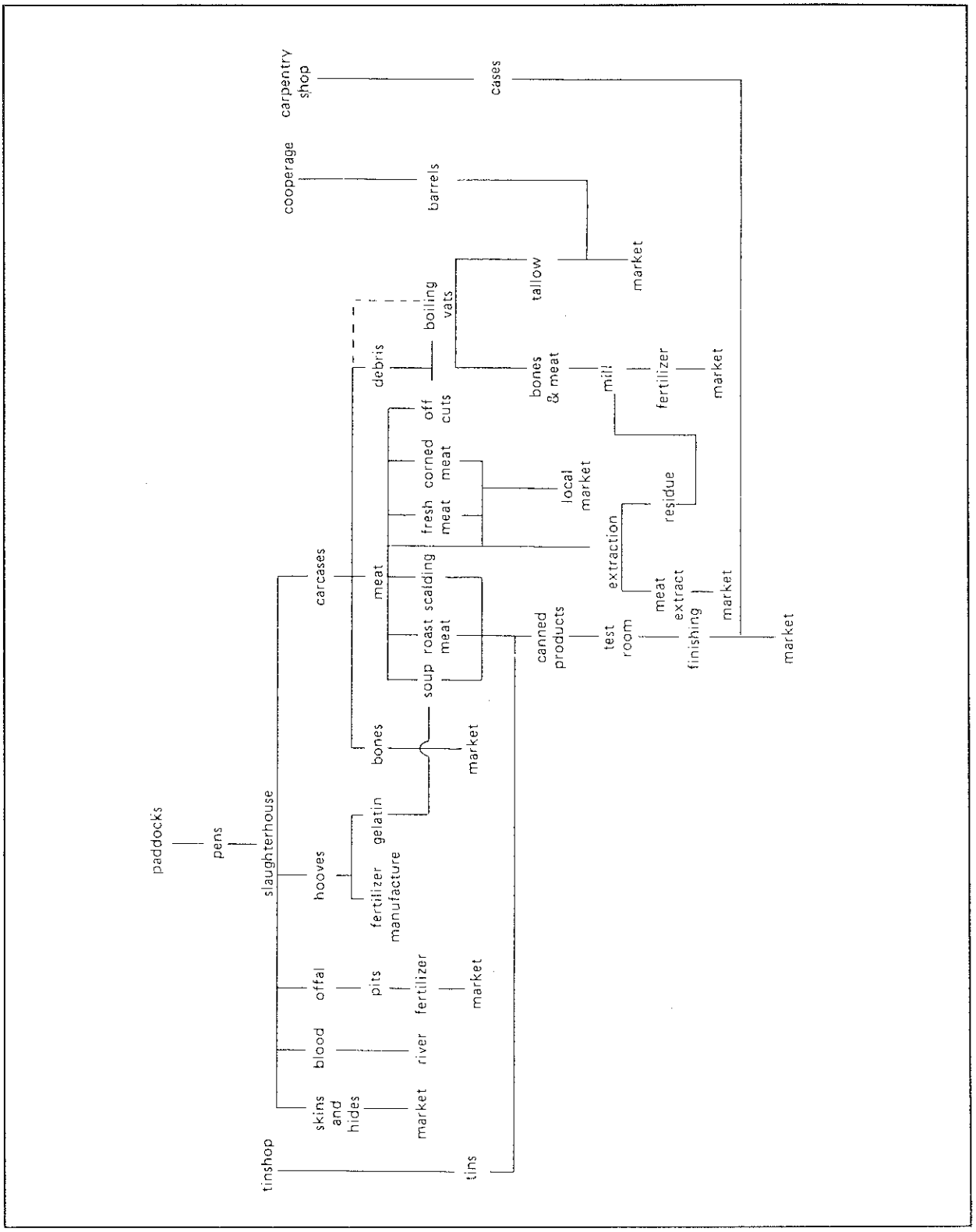

Figure 7. Flow Chart of production processes at the Australian Meat Preserving Co. Works.[87]

[87] K.T.H.Farrer, *A Settlement Amply Supplied*, p.82, flow chart prepared from historic descriptions of the operation of the works.

£20,000 was spent on plant, machinery and other improvements between 1868 and 1870.[88] Almost all the plant and machinery were of colonial manufacture. Some buildings were possibly erected after October 1868, when two etchings appeared in the *Illustrated Australian News*. A drawing in the La Trobe Collection (1868) shows buildings, on the left, not shown in the published drawings. The initial renovations and installations of 1868 were followed up late in 1869, when sales overseas seemed to be increasing and an extra kitchen was added.

> *Every cargo that has arrived has been eagerly bought up for consumption, our agent in London assures us that a ready marked can be found for any amount of our productions at remunerative prices, and urges upon us the advisability of extending our operations, and pushing on the works vigorously. A considerable accession to our share list having ensued subsequent to these advices, your directors determined on enlarging the works, and have now added four more preserving pans, which will enable us to increase our manufacture to 15,000 tins per week.*[89]

With increasing demand for their products overseas, the company contemplated further developments in 1871.

> *With a small outlay in the preserving room the meat producing capacity of the company's works could be increased enormously ... Before the (Franco-Prussian) war broke out, the market was overstocked. Since then the quantity exported from this colony had increased ten-fold. The war had led to such an enormous consumption in France and Germany that at present the demand was insatiable.*[90]

Major extensions took place in 1872, when a new tinsmiths' shop and machine room were built.[91] A set of six etchings in the *Australasian Sketcher* in 1873 show some of the main departments of the factory.

In these early years of the Melbourne Meat Preserving Company, the factory at Maribyrnong was leading the world. Australian tinned meats dominated the London market and the study area provided approximately half of the imported tinned meat. This was before other countries such as New Zealand, Argentina and the U.S.A. had built up their production and export of preserved meat. (See later section) Samuel Sextus Ritchie played a major role in this development. K.T.H. Farrer describes him as 'an experienced and capable technologist, probably the best in the country' and suggests that 'it is almost certain that the company succeeded because Ritchie organised and 'managed the plant.'[92]

The documentary evidence for this period of the study area's history is substantial, but particularly important is the evidence of the surviving buildings themselves. They are indeed 'documents of stone' which need to be read very carefully in order to gain an understanding of the early structures built or renovated by Albert Purchas before the fire of 1873.

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[88] T.G.Parsons, 'Some Aspects of the Development of Manufacturing in Melbourne, 1870-90', Ph.D. thesis, Monash University, 1970.

[89] *Australasian*, 9 October 1869, p.468-9.

[90] *Argus*, 4 April 1871, p.7

[91] *Argus*, 4 April 1872, p.2 Supplement.

[92] K.T.H.Farrer, *A Settlement Amply Supplied*, p.127.

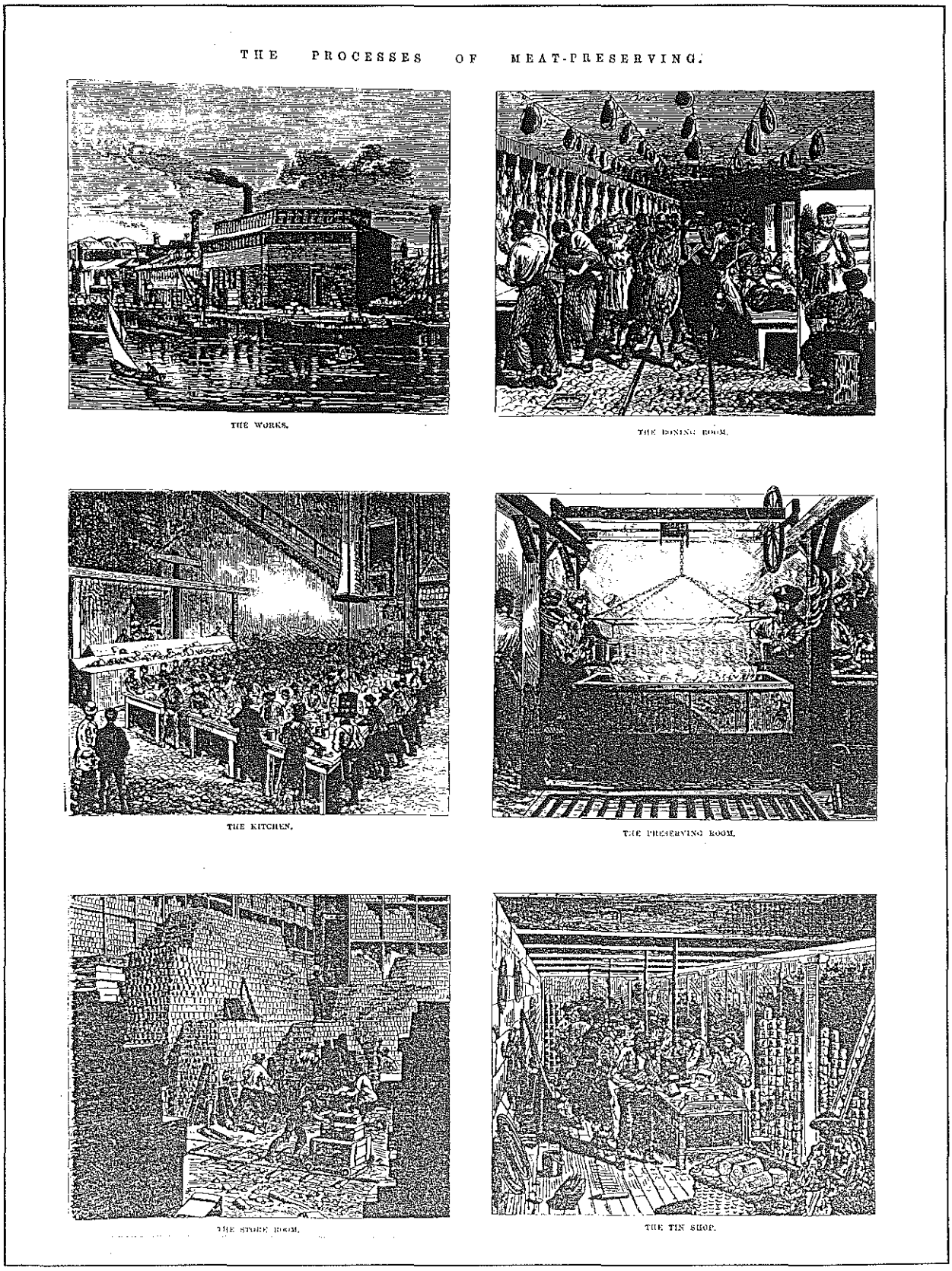

Plate 6. The Process of Meat Preserving: work at the Melbourne Meat Preserving Co, Maribyrnong.[93]

[93] *Australasian Sketcher*, 19 April 1873. La Trobe Collection, State Library of Victoria. set of six etchings.

Fire and a re-built factory 1873-1886

Considerable changes took place in the main part of the study area in 1874, following a substantial fire in December 1873, when the plant, machinery and cooking and preserving rooms were so much damaged as to necessitate the discontinuance of meat preserving operations for some two or three weeks to come'.[94] The fire threatened at one time to destroy the whole factory, but was put out by' about 50 men employed at the establishment living in the vicinity' [95]and other local residents. The preserving room and cooling room were completely gutted.

The cost of damage was covered by insurance, but there was an inquest. The manager, S.S. Ritchie, in giving evidence, ruled out the possibility of arson. 'The men had everything to lose and nothing to gain by the fire'.[96] Thomas Lloyd, butcher, who lived on the premises, first saw the fire and gave the alarm. The insurance figures give some idea of the extent of damage. The damaged portion of the factory was insured for £5,250. This was 57% of the total insurance value. The undamaged portion was insured for £4,000 or 43% of the total value. Operations continued on a limited scale using the facilities of the Australian Meat Preserving Company, further down the river at Footscray.

The factory was 'put in a thorough state of repair' [97] and the value of the company's assets increased considerably. The value of the buildings increased from £16,486 in April 1874 to £19,459 in April 1875, an increase of 18%, while the value of machinery increased from £5,477 in April 1874 to £7,343 a year later, an increase of 34%. However, the slackness of trade delayed resumption of full-scale production. By October 1874, work was completed and the *Argus* reported in detail on the 'now completed new factory'. The *Argus* article enthusiastically described the scene.

> *Beautifully situated in a picturesque bend of the Saltwater River, among gently sloping hills that are now beautifully green, and surrounded by orchards in the full glory of efflorescence ... handsome managers' and foremen's residences, long rows of workmen's cottages ... a garden of some four acres ... on a well-sheltered alluvial flat, and here all kinds of vegetables and pot-herbs are raised for use in the factory* .[98]

The main change in the factory following the 1873 fire was the consolidation of activity in the cooking and preserving department in an open plan building, with two levels. A visiting journalist commented that the works were in a district far from 'the busy haunts of men' and suggested that there was no township or house immediately near it. He was probably ignorant of the little terrace of twelve bluestone houses, or the manager's residence five minutes walk from the works, or the private school, conducted under the auspices of the company, which had 35 pupils in 1882.[99] The same journalist of 1882, described the buildings as 'almost entirely isolated': and further set the scene thus:

> *At the rear there is a tall cliff which almost shuts out the view in that direction, and in front the Saltwater River flows lazily by, except when stirred by the motion of the lighters and steam-tug which convey the company's products to the bay, while further on the ground rises to such an elevation that Melbourne cannot be seen.*[100]

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[94] *Age*, 8 December 1873, p.3.
[95] *Argus*, 8 December 1873, p. 6.
[96] Public Records Office of Victoria, VPRS 407, unit 14, no. 764, 1873. (Fire inquests)
[97] *Argus*, 8 April 1874, p.6.
[98] *Argus*, 6 October 1874, p. 6.
[99] *Victorian Parliamentary Papers*, Report of the Minister of Public Instruction, Appendix K, 1882, p.232. Of the 35 pupils on the roll, twenty-seven were girls and eight were boys. On 4 April 1881, twenty children were in attendance.
[100] *Australasian Trade Review* , 12 April 1882, p.189.

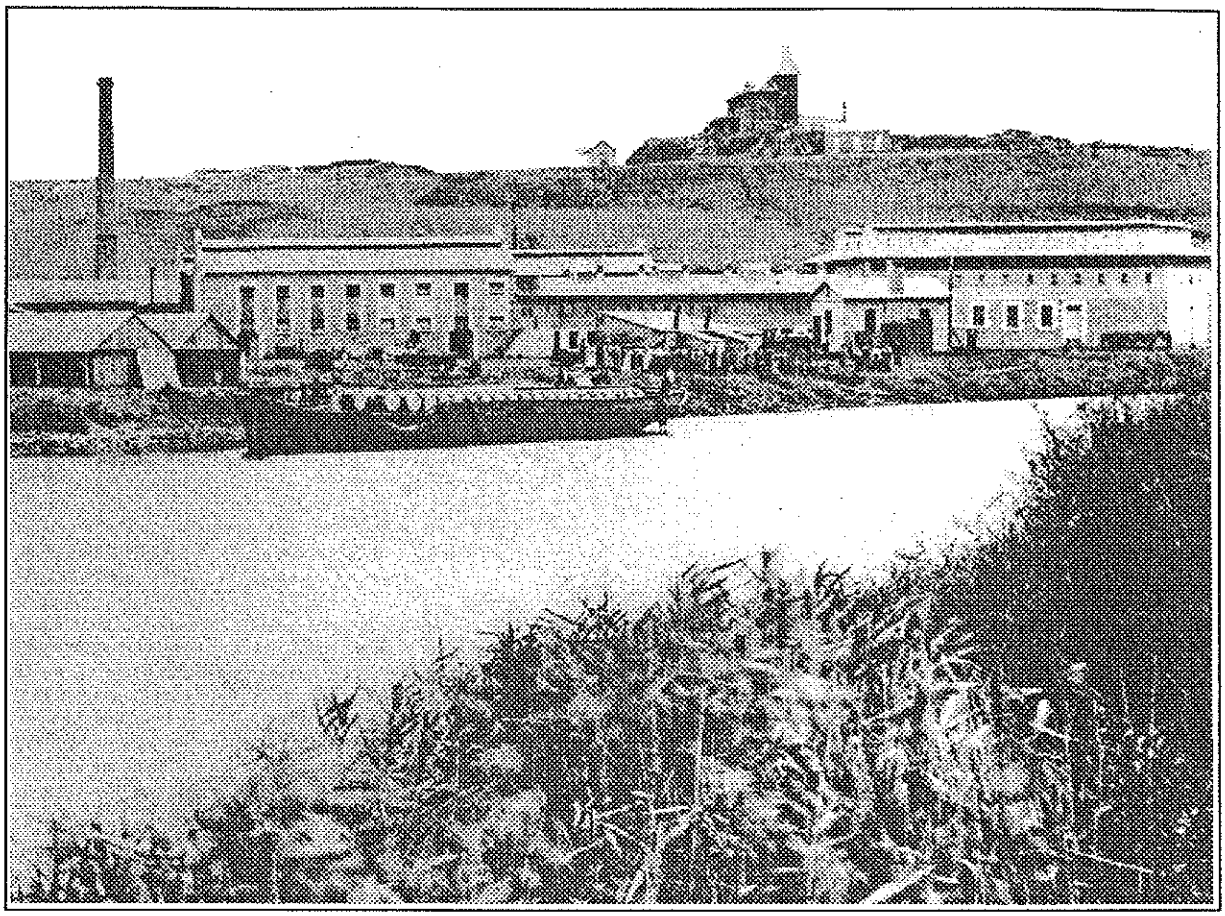

Plate 7. Melbourne Meat Preserving Co. Works c.1880.[101]

The bluestone castle-like building on the hill was now a lodging house, not a hotel, with Arthur Poulton, tinsmith, as lodging-house keeper. There were two hotels less than ten minutes away - the Maribyrnong Bridge Hotel , owned by the company, and the Anglers' Hotel. Over the hill, a quarrying firm was making use of the company's land. Also on company land at this time were the works of the Australian Frozen Meat Export Company (see later section), though it was soon to move to Newport.

There were 250 men employed by the Melbourne Meat Preserving Company in April 1882,when the *Australasian Trade Review* published a detailed article on the factory at Maribyrnong.[102] But the works closed soon afterwards and operations were very limited during the next six months. In the following half year to April 1883, work was carried on for only sixteen weeks. Activity improved in 1884 but by 1885 the factory was running at a loss and at the April meeting in 1886 it was decided to wind up the company.

An 1886 sale notice provides valuable evidence regarding the factory and its facilities.[103] The land comprised 191 acres which included 'magnificent bluestone'. Listed separately were 'commodious stores, sheds, two slaughter yards, travelling cranes'; 'extensive stabling, containing 18 stalls, hay shed, cart shed etc.'; a large weatherboard schoolhouse; a bluestone boarding house (for men temporarily employed); twelve bluestone cottages, six comprising

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[101] Original photograph by C.Rudd, in the collection of Mrs. R. Ravenhall. This appears to be a section of a larger photograph depicted in full in *Sunshine Cavalcade,* 1951.

[102] *Australasian Trade Review* , 12 April 1882, p.189.

[103] Chief Secretary's Correspondence, 1886/E 12407, Public Records Office, Melbourne, (also noted in the Argus Sept. 1886).

three rooms, six comprising four rooms; a compact manager's residence, containing three sitting rooms, six bedrooms, washhouse, dairy etc; a bluestone villa residence in the occupation of C.B. Fisher Esq. The Maribyrnong Bridge Hotel was also up for sale but sold quickly as a separate item.

The size of such a list gives some idea of the extent of the assets developed by the Melbourne Meat Preserving Company and provides a context in which to evaluate the conservation value of the study area. As pointed out in 1869, the site of the works was 'but a very small part of the estate' held by the company. Between 1871 and 1886 the net annual value of the property increased from £400 to £960, though this partly represented increased land values generally, as well as improvements made by the owners over time. To assess the significance of the study area in a wider national and international context, it is necessary to trace the operations of the company and its works at Maribyrnong, from other perspectives - productivity, commercial impact, technological expertise and the social dimension. These are discussed in the following section.

Productivity and impact 1868-1886

In the years 1869-1872, Australian preserved meats dominated the British import market, and the products of the Melbourne Meat Preserving Company provided a substantial proportion of the trade. The *Economist* journal in London reported in March 1870: 'In every variety of form -potted, pickled and preserved - the Australian meat now reaches this market. *The trade is growing greatly* and at the moment there is great excitement throughout the colony on the subject'.[104] Nine meat preserving companies were registered in Melbourne by the end of 1870, but few of these survived.[105]

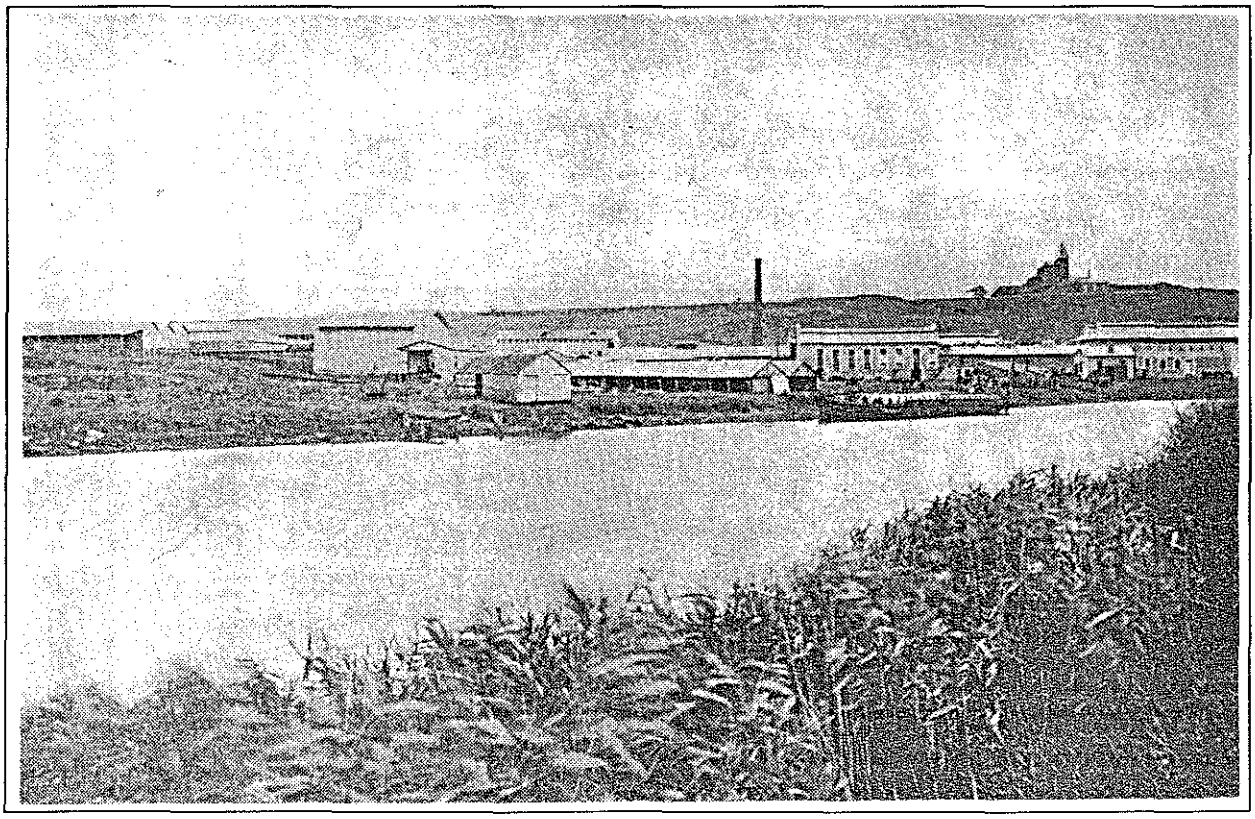

Plate 8. Maribyrnong Meat Works with old castle in the background c.1880.[106]

[104] *Economist*, 12 March 1870, p.12.

[105] G.J.R.Linge, *Industrial Awakening*, pp.238-245.

[106] *Sunshine Cavalcade*, 1951, original photograph not found.

Productivity and commercial impact

The original expectation in 1868 was that the new factory would be able to 'work up' or process about 3,000 sheep and 50 bullocks a week, with the possibility of increasing this to 10,000 sheep and 100 bullocks a week. 80 'hands' were to be employed at the outset and increased to 120. An early order from the French government was for 200,000 pounds of preserved meat. and Prince Alfred, Duke of Edinburgh, gave a favourable report on a trial sample, after ordering that the preserved meat be issued to his officers.[107] By July, sales of the company's meats in England were going well, though production had halted in April and May, because of drought, stock scarcity and rising stock prices.[108] By November 1869 the factory was employing 150 men and lads. One ship, the *Palmtree*, took away 287,000 pounds of meat preserved by the factory at Maribyrnong and 250 tons of tallow. This was the product of three weeks work.[109]

> *Meat preserving and diamond mining are at present the two most prominent objects of colonial enterprise. The recent very encouraging reports of the increased and still rapidly increasing demand for Australian preserved meats in England have moved our principal company to a great extension of their works at the Saltwater river near this city. They will soon be in a position to preserve about 40 tons a week.*[110]

Previously, in July 1869, the *Times* correspondent had been commenting favourably on some of the company's products, especially the spiced beef, preserved ox and sheep's tongues and kidney soup. By February 1870 the company was purchasing 7,000 to 8,000 sheep and from 80 to 100 head of cattle per week, altogether worth £3,500 to £4,000. Weekly production at that stage was 17,000 tins of preserved meat worth £2,450; 65 tons of tallow worth £2,350, and sheepskins, hides , bones and sundries worth £1,200. In January 1870 alone, the products exported from the Maribyrnong works totalled 48,620 tins of meat and 780 casks of tallow. Local consumption in the 17 months since the works began operating was 61,455 tins or 183,806 pounds of meat.[111]

Out of 3,640 tons of Australian canned meat imported into Britain in 1870, three-quarters were mutton and more than half the total supply was from the Melbourne Meat Preserving Company.[112] The *Economist*, a British journal, was reporting:

> *In Victoria, the meat preserving industry is now firmly established. The Melbourne Meat Preserving Company have already shipped home upwards of 273,000 lbs. of preserved meat. Their agents recommend them to ship much larger quantities. The chairman of the company stated lately at a dinner of the employés that the trade was thriving, and that though 10,000 tins were turned out of the works every week, yet there was a demand for 100,000 tins a week.* [113]

In London in December 1870, the company's agent was stating in the *Times* newspaper that he had received 38,000 cases or 3,070,885 pounds of tinned meat from the Melbourne Meat Preserving Company and only had 200 cases left.[114] The total number of cases imported into London from Australia and New Zealand in 1871 totalled 243,344, in addition to 'a considerable number of casks'. During the six months ending 28 February 1872, the Melbourne Meat Preserving Company killed 1354 oxen and 133,117 sheep and shipped 938 tons of canned mutton to London.

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107 *Times* (London), 2 October 1868, p.10.
108 *Times* (London), 16 July 1869, p.10.
109 *Sydney Morning Herald*, 23 November 1869, p.5.
110 *Times*, 2 November 1869, p.8.
111 *Argus*, 26 February 1870. The January export totals represented 295,012 pounds of meat and 254 tons of tallow.
112 K.T.H.Farrer, *A Settlement Amply Supplied*, p.106.
113 *Economist*, 12 March 1870, p.12.
114 *Times*, (London), 5 December 1870, p.6.

In June 1872, 480,000 pounds of tinned mutton from the Melbourne Meat Preserving Company were shipped to London, but there were also small shipments to Java, resulting in 'gratifying reports', and to various Indian and China ports. However, reports came in from Australia that the prices of sheep were too high for meat preservers and operations were merely carried on 'to avoid the inconvenience which would result from the dispersion of the operatives'.[115] In August that year, stock prices were still high and the Melbourne Meat Preserving Company was one of only two companies in Victoria which were still continuing with production. Ironically, the very success of the meat preserving companies was a factor in raising sheep and cattle prices, which in turn made operations unprofitable.[116]

Response to Australian tinned meat in Britain varied from enthusiasm to indifference. Large contracts were negotiated initially to supply the army. the navy, gaols and workhouses. Some accounts indicate that British working people were slow to accept the new Australian canned meats. In 1871, canned meats from New Zealand were increasing. It was not until 1873 that there began the establishment of meat companies in South America. By this time the Texas companies were already competing for a share of the trade. the *Economist* warned: 'The colonies will shortly have some competition in the field'[117]. By 1874 preserved beef from Texas and South America was beginning to assume large proportions and by 1875 the *Economist* was referring to ''quantities received from various new fields of production' and reporting that: 'new establishments have been formed in South America, Canada, California, Texas and other portions of the United States'.

The South Americans had improved their quality and reduced prices in order to get a footing in the market. However, it was not until 1877 that United States imports exceeded the Australian canned meat in volume and quality. Even in 1878, when the American producers had established themselves, there were complaints about 'rubbish' from Texas. The *Economist* reported in 1880:

> *Stimulated by the necessity for meeting the public trade, the Australian preservers are now sending in compressed mutton and beef of excellent quality - pronouncedly superior in many cases to the Americans. Prices, we are inclined to think, are too low to be remunerative.*[118]

Between September 1868 to February 1882, the Melbourne Meat Preserving Company slaughtered 2,231,853 sheep and 15,709 bullocks and produced 25,400 tons of preserved meat. This was 71 % of the total exports of Victorian meat during the same period and represented 9,500,000 tins of meat. The Maribyrnong factory also produced 15,400 tons of tallow.[119]

Table 2: Products of Melbourne Meat Preserving Company works, Maribyrnong, 1868-1882

CANNED MEAT	TALLOW
538,951 cases (exported meat)	39,596 casks (exported)
+ 30,000 cases (local sales)	6,713 casks(local sales)
568,951 cases	46,309 casks

Table 3: Value of products of Melbourne Meat Preserving Co. works, Maribyrnong 1868-1882

CANNED MEAT	TALLOW
£765,016 (exports)	£473,433 (exports)
£50,000 (local sales)	£45,096 (local sales)
£815,016	£518,529

[115] *Times*, (London), 22 January 1872, p.6; 6 September 1872, p.5.
[116] *Times*, (London), 4 October 1872, p.6; 15 April 1873, p.7.
[117] Economist, 15 March 1873, p.23.
[118] *Economist*,13 March 1880.
[119] *Australasian Trade Review* , 12 April 1882, p.189.

The period 1868-1880 was very much the golden age of meat preserving for Australia, and Victoria especially. The later years saw a big decline. G.J.R. Linge has estimated that 'whereas 36,000 tons of preserved (mainly canned) meat had been exported [from Victoria} by the end of 1880, the next ten years saw only 7,300 tons of canned meat and 8,200 tons of frozen mutton pass over the wharves.' [120] Victoria exported the biggest proportion of Australian preserved meats to the United Kingdom in the years 1869-1871, 73% of total exports of Australian preserved meat. This Victorian dominance of canned meat exports decreased in the years following, but averaged 49% of Australian canned meat exports for the next nine year period.

Figures fluctuated from year to year, depending on prices, markets, supply and demand, but clearly the Melbourne Meat Preserving Company was a key contributor to the Australian canned meat export trade throughout the 1870s. The company's decline is perhaps reflected in Victoria's reduced proportion of Australia's export trade in canned meat, averaging 15% for the next six-year period up to 1886.[121] (a table of production of the works in relation to total Victorian exports is shown in Appendix D)

The company's impact went beyond the immediate context of the pastoral industry or the newly developing industry of meat preserving. It affected the transport industry, metal trades and engineering firms and provided employment, though not always continuously, to hundreds of people. G.J.R. Linge summarises this broad impact:

> *Apart from the demand placed upon shipping companies and the Railway Department for the movement of livestock, tinplate and produce, the company also provided direct employment for a variety of other trades. It had a small army of tinsmiths on the premises manufacturing the thousands of containers required ... In addition there were some important stimuli given to other industries, not because they were particularly valuable but because they pushed firms into attempting types of work in which they had little previous experience. The construction of cookers, digesters and can-making equipment gave local firms useful experience which they were able to turn to good account when bidding for similar contracts in other colonies.*[122]

Technological achievement

The Melbourne Meat Preserving Company was, according to G.J.R. Linge: by far the most successful of all the Victorian processing companies' and 'among the pioneers - even in world terms - of food preservation on a commercial scale'.

> *At the same time, they also had to become innovators in related fields such as transport technology and materials handling. Although the Chicago meat-packing works operated on a larger scale, they were not in all respects more efficient: thus the Melbourne company adopted the more successful American system of packing in square tins in 1878. but beat the originators at their own game by developing machinery that could fill them twenty-four times more quickly'* [123]

E.A. Beever has suggested that the Melbourne's first meat export company had great influence on the later development of meat canning in Australia.

> *The Melbourne Meat Preserving Company, rather than the Northern extract enterprises, was the model for most later businesses: it was a model for the technique of canning it employed; for its concentration on mutton; and for its flexible combination of mutton canning with boiling-down; it was a model institutionally as a local public company in which merchants and squatters combined with the dual objectives of dividends and indirect benefits to*

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120 G.J.R.Linge, *Industrial Awakening*, p.243.

121 K.T.H.Farrer, *A Settlement Amply Supplied*, pp.248-249, has provided the figures on which these percentages are based.

122 G.J.R.Ling, *Industrial Awakening*, p..244.

123 G.J.R.Linge. *Industrial Awakening*, pp.238, 244.

themselves. The Melbourne Meat Preserving Company was also an inspiration to later companies simply because from the outset it succeeded.[124]

K.T.H. Farrer has written of 'such sophisticated factories as the Melbourne Meat Preserving Company's works at Maribyrnong ... an advanced integrated operation which would bring no disgrace on the management of a modern meat works' and has described the factory there as 'the most important of the Victorian meat canneries. [125] It was a model for other meat canneries, notably the Sydney Meat Preserving Company, established in 1871. The manager at Sydney, Alban Gee, had been one of the senior staff at the Melbourne company in its early years. A description of the Sydney factory in 1896 reflects many of the features of the works at Maribyrnong.[126] William Anderson, chief meat preserver at Maribyrnong 1873-1882, and once described as 'one of the best meat preservers in the world',[127] went on to establish his own Flemington Meat Preserving Company which successfully operated from 1883 until 1916.[128]

Some contemporary commentators hailed the meat cannery at Maribyrnong as of international significance. The *Sydney Morning Herald* declared in 1869: 'As a meat preserving establishment it has not a rival in the world', pointing out that the larger works at Buenos Aires were engaged in producing meat extract.[129] The *Argus* of 1874 suggested that the Maribyrnong factory was 'probably the largest of the kind in the world, as well as the most complete in its arrangements, and effective in its working.' [130]

Rod Elphinstone has referred to the early preserved meat export with Britain and made a bold claim.

This trade, as a large-scale commercial operation, was effectively pioneered and for some years dominated by the Melbourne Meat Preserving Company ... the first really large-scale meat cannery in Australia. Almost certainly therefore, it was the first large-scale meat export cannery in the world.[131]

This claim to international significance needs further consideration before being accepted too readily. E.C. May in *The Canning Clan,* a study of canning in the United States, gives but one passing reference to Australian canning development, in relation to 'William and Henry Dauger [Dangar] who had pioneered in Australian meat canning since 1847. They and other Australian meat canners had sent the bulk of 260,000 pounds into the mother country in 1868.[132] However, May's book shows that early American canning development related mainly to vegetables and fish and the export trade in canned meat did not expand until the mid 1870s.[133]

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[124] E.A.Beever, 'A History of the Australian Meat Export trade, 1865-1939', Ph.D. thesis, University of Melbourne, 1967, pp.9-10.
[125] K.T.H.Farrer, pp. 2, 82-3 (including chart), 120.
[126] *Leader*, 6 June 1896; Age, 3 June 1896.
[127] *Argus*, 8 October 1878, p.7.
[128] *Weekly Times*, 7 July 1906 p.9.
[129] *Sydney Morning Herald*, 23 November 1869, p.5.
[130] *Argus*, 6 October 1874, p.6.
[131] Rod Elphinstone, 'Humes Historic Site: Investigation and Conservation Report', Melbourne, 1984, p.22.
[132] E.C.May, *The Canning Clan: A Pageant of Pioneering Americans*, New York, 1938, p. 216.
[133] See also K.T.H.Farrer, pp. 151-152, 198-199.

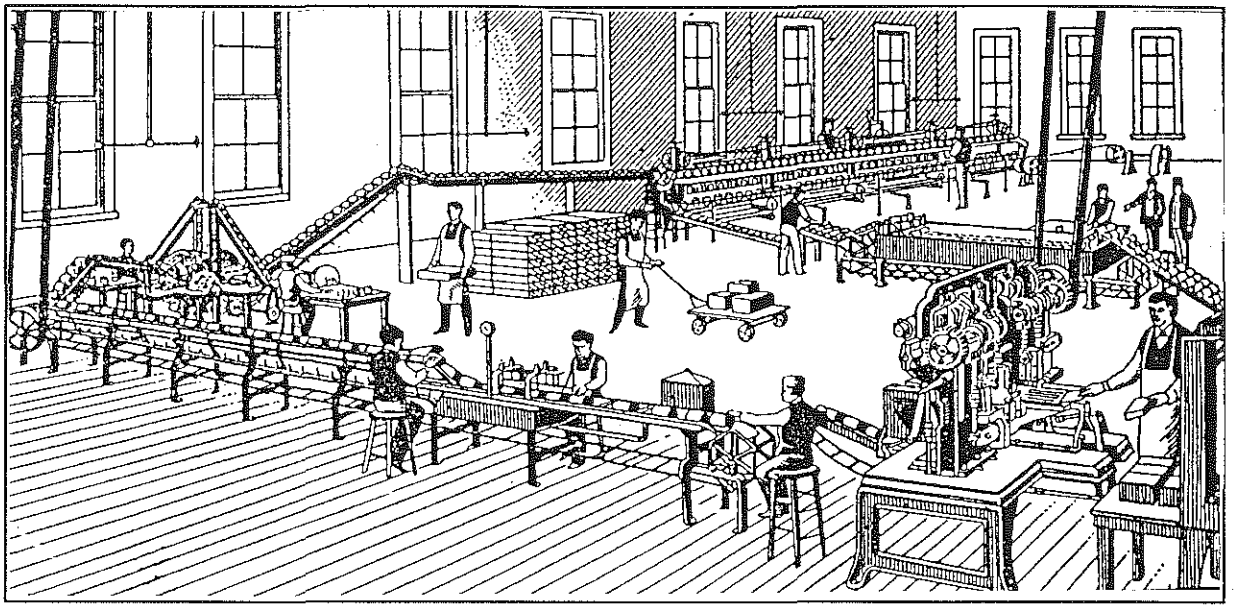

Plate 9. Automated machinery for making tin cans in late 19th century.[134]

There were successful examples of meat canning in the 1840s and 1850s and canners such as William Underwood had sold quantities of canned meat to the United States Army in the American Civil War. The Libby brothers had been doing a brisk trade in preserved meat, by packing beef in barrels and sending it to the eastern states. Since 1868, they had begun parking corned beef in Chicago in straight-sided cans, purchasing the cans. A shipment of 50 cases of two dozen cans each met with favour in England, but the Libby brothers and their partner McNeil were searching for a more suitable shaped can. They joined forces with the Wilson Packing Company and in 1875 were 'putting up their corned beef in rectangular tapered tins.' But these times were seen as 'the struggling 1870s when the Libbys' concern was slaughtering a hundred cattle a day. '

In 1883, the Norton Brothers were developing 'a complete automatic line for manufacturing steel-bodied tin-coated food containers at relatively high speeds and in relatively large quantities.' Chicago had been developing as a stockyards and meat-packing centre since the 1830s, but the early packing seems to have been in barrels.

By the 1880s the United States meat trade with Britain and Europe had grown considerably, though 'authoritative statistics' are not always available. According to the *Economist*'s analysis of the various sources of imported meat, it was not until 1884 that imports of preserved meats shipped from New York exceeded those from Australia. At one stage the Melbourne Meat Preserving Company were even paid the dubious compliment of having their labels placed on tins of inferior Texas meat. Both countries were using technologies derived from England and France. Both countries were also developing the export of fresh meat in frozen form. The study area was also the site used by Australia's first frozen meat export company, which is described in the following section.

It could therefore be argued, with some justification, that the study area is of international significance, in terms of its role in the development of a world-wide meat export trade.

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134 T.K. Derry & T.I. Williams, *A Short History of Technology*, p.698.

Social dimension

The Melbourne Meat Preserving Company's operations at Maribyrnong provide an interesting case study of a small industrial community, a company village in colonial Australia. There are a number of indications of a benevolent management: the company housing let to employees; a sub-division of company land sold to employees in the expectation of developing a company village called 'Hampstead'; a private school operating under the auspices of the company; a canteen for the workers; an employees' dinner; a respected and fair manager.

However, there was a darker side: at least one strike; accidental drownings; no security of tenure and frequent closures of the works at slack times, as with all meat works; a downward mobility as the economic prospects worsened.[135] These aspects are not reflected in physical structures within the study area, but are relevant to understanding the scale of operations and the actual experiences of the employees. In the absence of oral history, a reconstruction of meat cannery families and a tracing of their story through many fragments of evidence provide rich resources for interpretation.

The shareholders of the company are the other side of the social equation. They included some of Victoria's leading business men, squatters and even politicians. Sir Samuel Wilson and C.B. Fisher were among those who had shares in the company and attended company meetings. They did not always get their 10% dividend but their own livelihoods were influenced by the operations of the Melbourne Meat Preserving Company and its effect on the price of stock, especially in the early years.

It could be argued that the aspirations of shareholders and management are represented in the solid, simple and dignified architecture of the buildings, especially Buildings 1 and 2. The buildings are the physical link between the shareholders and the workers, representing the money invested and the work undertaken. The operations of the company connect, not only with the export markets of the world, but with the growth of Melbourne as the financial centre of Australia, in the post-gold, pre-boom period. Some of the leading shareholders increased their position during the 1870s-80s, such as Hastings Cunningham , whose firm became Australasian Mortgage & Agency Co. in 1879,and William Sloane, whose company became Union Mortgage & Agency Co. in 1885, and later Australian Estates Ltd. Other shareholders went broke, such as Hugh Glass and C.B. Fisher.[136]

The company's architect, Albert Purchas, also a shareholder, was another link between the shareholders and the substantial works at Maribyrnong. His involvement with the firm continued throughout its 20 years. Not only did he design and supervise the renovations and extensions of the 1868 factory and later structures at Maribyrnong. He also took on work for company directors and shareholders, such as James White, merchant (Hawthorn) Robert Sellers Esq. (Malvern), Robert Simson, M.L.C. (Toorak), and was responsible for large-scale extensions to bluestone woolstores for Hastings Cunningham.[137]

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[135] See O.Ford, 'Voices from Below: Family School and Community on the Braybrook Plains, 1854-1892', M.Ed. thesis, University of Melbourne, 1993, section on the families connected with the meat cannery at Maribyrnong , pp. 36-58.

[136] G.Serle, *The Rush to be Rich: A History of the Colony of Victoria, 1883-1889*, Melbourne, 1971, pp.48-49 (Hastings Cunningham and William Sloane); M. Kiddle, *Men of Yesterday: A Social History of the Western District of Victoria, 1834-1890*, Melbourne, 1961, pp. 274-5.

[137] Miles Lewis, Australian Architects' Index, microfiche copy, State Library of Victoria.

Australian Frozen Meat Export Company

The Australian Frozen Meat Export Company occupied the study area for only a brief time, but its operations were a further landmark in the history of the meat export trade and in Australia's technological and economic development.

Mechanical refrigeration is one of the inventions pioneered in Australia, when James Harrison developed a refrigerator machine using an ether compression engine in 1851. The principle of refrigeration involved the removal of heat, the reverse of the meat canning process, which involved the application of heat. Harrison patented his process and his apparatus in Australia and England but gained little support and no financial success.[138]

The 1870s saw the development in Australia of experimental work in refrigeration and evidence of a grasp of the main principles of the new technology. Meanwhile, developments in North America included the shipment of frozen meat from Canada in the northern winter, consignment of meat to England from Europe packed in ice, the transporting of meat from Texas eastwards, in iced rail trucks and the extension of this system across the Atlantic, with a trial shipment of 40 tons in 1875. K.T.H. Farrer points out that 'the northern latitudes and short voyage enabled the North Americans to get away with 'makeshift cold storage'.[139] However, the long haul from Australia posed greater challenges.

Events of worldwide significance in the development of the frozen meat export trade were the work of the sailing of S.S. Paraguay from Argentina to France in 1877-8 and the sailing of S.S. *Strathleven* from Sydney to London with consignments of frozen meat and butter 1879-80. Meat was loaded in both Sydney (29 November 1879) and Melbourne (6 December 1879) and arrived in London in February 1880. The whole consignment of 30 tons was in a Bell-Coleman compressed air refrigerating plant developed in Glasgow.

Even before the news of the successful shipment on the *Strathleven* reached Melbourne, moves were afoot towards the formation of the Australian Frozen Meat Export Company. One basic reason for the company's establishment was an awareness of the market in England. and a realisation that 'the people of England and other parts preferred joints of mutton to tinned meat'.[140]

Meetings were held late in 1879 and early 1880 and the new company established in April 1880, with a capital of £100,000 in £100 shares.[141] Sir James McCulloch, three times Premier of Victoria, was the chairman. The company had no freezing works or ships. However temporary freezing works were organised at the Maribyrnong works of the Melbourne Meat Preserving Company. In October 1880, the *Argus* reported on developments:

> *The Australian Frozen Meat Export Company has made arrangements for shipping 250 tons of frozen meat by steamer Pallace, which is chartered to leave this port on 31st inst. The meat will consist of the carcases of 7,000 sheep & of a quantity of beef. The chamber in which the meat will be stored is to be completely lined with wool. The machinery at the company's works at Footscray is now in course of erection, and it is expected to be at work by the end of this week.*[142]

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138 K.T.H.Farrer, pp.184-5, 188-190.
139 K.T.H.Farrer, p.191.
140 *Argus*, 30 May 1883, p.9.
141 *Age*, 2 April 1880, p.2
142 *Argus*, 4 October 1880, p.5.

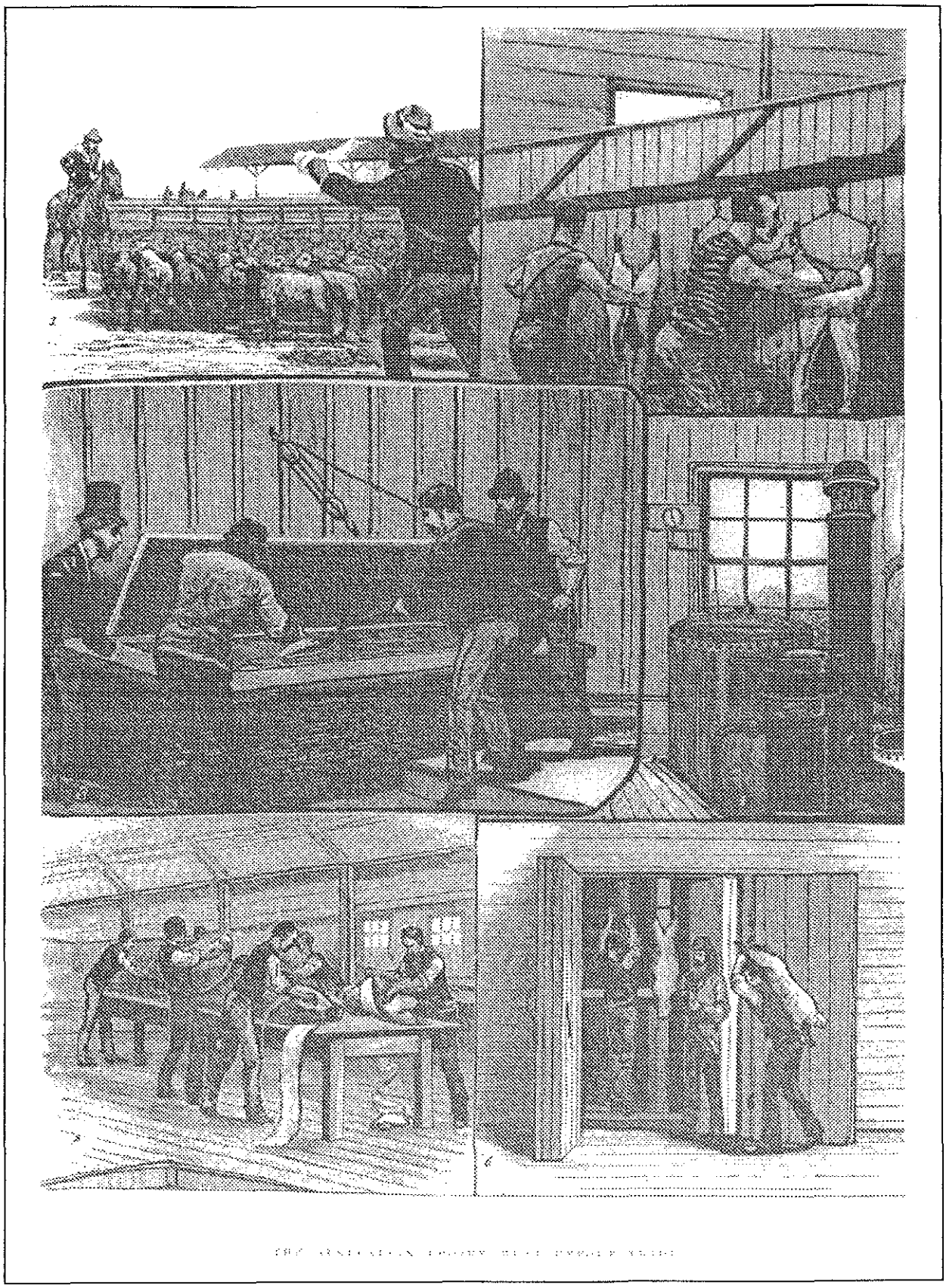

Plate 10. Australian Frozen Meat Export Company's Works at Maribyrnong.[143]

143 *Australasian Sketcher*, 12 February 1881. La Trobe Collection, State Library of Victoria.

The same week, at the twice-yearly meeting of the Melbourne Meat Preserving Company, the company's chairman reported that:

> *The directors had entered into an arrangement with the Australian Frozen Meat Export Company to assist them in their operations. A freezing chamber for the use of the FMECo, had been constructed on the premises of the Meat Preserving Company and the directors of the latter had agreed to supply the former with all the labour necessary for carrying on operations. The terms arranged were mutually advantageous but the Melbourne Meat Preserving Company took 'no responsibility whatever with respect to the operations of the Australian Frozen Meat Export Company or the production of their meat The machinery in connection with this new department was expected to be started this week and ... the company had made arrangements for the despatch of a large quantity of frozen meat by the steamer Protos by the end of this week.*[144]

The freezing chamber was constructed under the supervision of Albert Purchas.[145] The processes of the frozen meat enterprise at Maribyrnong are described and illustrated in the *Australasian Sketcher* of 12 February 1881. These show the workers of the Melbourne Meat Preserving Company yarding the animals and packing the carcasses ready for freezing.[146]

The first *Protos* cargo of frozen mutton and beef landed in first rate order in England in February 1881. Some months later, the *Argus* reported that the *Protos* shipment had been disposed of in London. The entire cargo of mutton, consisting of 4,000 carcases, realised prices of 5d to 7d per pound. A substantial consignment of 8191 carcases (together with 900 packages of butter) left Melbourne by the German steamer *Europa*, on 2 November 1881, arriving at Galle, 20 days later, in excellent condition. Especially significant on this voyage was the use of the new freezing machine constructed by Messrs Robison Bros. which worked most satisfactorily, with the temperature maintained at 10 degrees below freezing point, even without working the machine continuously.[147] A report of April 1882 indicated that the Australian Frozen Meat Export Company's carcases were superior to those of the Orange Company, which "suffered in conveyance from Orange to Sydney" when it became 'thawed... softened, and then pressed out of shape'.[148] There were some good carcases from the *Orient*, but also some bad ones.[149] There were reports of successful shipments reaching London, by the *Cusco* and the *Orient*, in a report in the *Argus* of 5 October 1882.[150] There were also some unsuccessful shipments.

At the meeting of the company in November it was resolved to establish new works near the port and a site was selected at Newport. A local newspaper reported that 'The freezing works at Maribyrnong are now stopped until the new works at Williamstown are completed'.[151] An adjourned ordinary meeting of the Australian Frozen Meat Export Company was held in May 1883, when the chairman outlined the initial difficulties the company had faced.

> *But the company had been successful to some extent It had established the fact that meat could be frozen here, and landed in London in a sound state, It might be said that the last cargo was not a success. But the first works of the company were at Maribyrnong, which was a long way from the shipping port and the meat in question was shipped in the hottest part of the year. The damage was done from the time when the meat in question left Maribyrnong until it got to the ship.*[152]

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144 *Argus*, 5 October 1880.
145 *Argus*, 2 August 1880; Miles Lewis, Australian Architects' Index, microfiche copy in State Library of Victoria.
146 Shire of Braybrook ratebooks, 1881-82.
147 *Argus*, 24 November 1881, p.7.
148 *Sydney Morning Herald*, 28 May & 12 December, 1881, quoted in G.J.R.Linge, *Industrial Awakening*, p.454.
149 *Argus*, 18 April 1882, p.5.
150 *Argus*, 5 October 1882, p.4.
151 *Williamstown Advertiser*, 19 August 1882, p.2.
152 *Argus*, 30 May 1883, p.9.

E.A. Beever has written: 'Of five shipments made in the first two years' operations , three yielded a profit and two made a loss, mainly because of partial decomposition. On the other hand, G.J.R. Linge has commented on the company's relative success and discussed the peculiarly difficult circumstances:

> *The surprising thing is that the failure rate (in the first two years) was no greater considering that the Maribyrnong works had been built a dozen years previously as a cannery; that the frozen carcases had to be conveyed 10 miles or so by rail to the wharf in the cool of the night, because at the end of 1882 there were only four refrigerated vans on the entire Victorian railway system; that the meat then had to be manhandled and lightered out to vessels anchored on the Bay; and that... the best way to convert the holds of the half dozen ships involved and to stow the meat could only be discovered by a process of trial and error.*[153]

Despite the improved location and the new works, the company did not prosper. E.A. Beever has written:

> *The Australian Frozen Meat Export Company had begun most encouragingly. Shipments increased to 1884 when the company exported nearly 100,000 carcases of mutton and maintained this level for the next two years. The Australian Frozen Meat Export Company was by far the largest exporter of frozen meat from Australia, but financially its operations were a failure.*[154]

From 1882, the company continued to run at a loss and having run out of funds, went into liquidation in 1886. The unprofitable nature of the Australian frozen meat export trade at this time resulted from many factors: relatively low prices in the London market, the effect of drought on sheep prices, high cargo rates, depressed conditions in England after 1883 and the competition from other sources.

However, the company and its early operations at Maribyrnong did have a profound influence on developments in the New Zealand frozen meat export trade, which expanded greatly in the 1880s.[155] The freezing works at Totara owed much to the Melbourne experiment[156] The Totara estate was run by the New Zealand and Australian Land Company. Its manager, William Soltay Davidson, had closely investigated the new Australian frozen meat enterprise. This included despatching his agent Thomas Brydone to inspect the loading of the second cargo of frozen meat on the *Protos* . The Maribyrnong works were illustrated in a New Zealand newspaper. John Hotson, secretary to the Australian Frozen Meat Export Company, later went to New Zealand and made a substantial contribution to the trade there.

The initial frozen meat export trade also had an effect on the dairying industry, since consignments of butter accompanied those of frozen meat. Shortly after the Australian Frozen Meat Export Company closed its freezing works at Newport, the government purchased the works and used it to develop the butter export trade.[157]

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153 G.J.R.Linge, p.243.
154 E.A.Beever, p.34.
155 Martine E..Cuff, *Totara Estate: Centenary of the Frozen Meat Export Industry*, Wellington,1982, pp.32-50.
156 Martine E. Cuff, *Totara Estate, Centenary of the Frozen Meat Industry*. The site for the slaughtering has since been preserved by the New Zealand Historic Places Trust and is managed as a museum. No doubt Davidson was inspired by the success of the *Strathleven* in delivering a cargo of 33 tons of frozen mutton to England. At the same time, New Zealand was facing a glut in its sheep trade.
157 K.T.H.Farrer, p.196.

Although the pioneering freezing works at Maribyrnong was only there for a relatively short time, it left a lasting impression. In an outline history of the study area in *Humes News* 1969, it is given considerable prominence, while the longer and far more substantial success of the Melbourne Meat Preserving Company is virtually ignored.

G.J.R. Linge has pointed out that the Australian Frozen Meat Export Company slaughtered 220,000 sheep during its six years of operation but it also 'became involved in the design, building operation and maintenance of refrigerated stores, railway vans and ships' holds along with applied research'.[158] Through its experimentation, practical experience and knowledge it contributed to the development of an infrastructure which was the basis of Australia's frozen meat trade, which in turn became an important component of 'one of the world's most important industries'.[159]

158 G.J.R.Linge, p.244.

159 J.T. Critchell and J. Raymond, *A History of the Frozen Meat Trade*, London, 1912, p.1.

2.6 From Quarries to Pipes

Interlude 1886-1910

Thomas Warr, merchant, previously a cartage contractor, was the purchaser of the 190 acres of land put up for sale by the Melbourne Meat Preserving Company in 1886. He was certainly not interested in the site as a meat cannery. It is more likely that he was attracted by the abundant supply of bluestone available west of the study area. Even the Meat Preserving Company's directors had realised that the site was more valuable for its stone by the mid 1880s, as Melbourne's building and railway boom escalated. One four-acre quarry on the property was being leased to Benn, Cadden and Puckle throughout the early 1880s, with a net annual value of £100.[161]

According to the shire ratebook for 1891-92, Thomas Warr was owner of 190 acres, comprising works and quarries, with a net annual value of £1,250; 12 houses (once the Meat Preserving Company's terrace of cottages), with a total net annual value of £215 and a house, probably the house occupied by Warr, with a net annual value of £.40 . Within five years, the property was half this value.[162] Thomas Warr was the proprietor of the Maribyrnong Quarrying Company, according to the Melbourne Directories for 1895-1898. The Maribyrnong quarry was one of many quarries operating in the Shire of Braybrook in the 1890s.[163] At this time Warr was an active councillor of the Braybrook Shire and was the leading spirit in the Diamond Jubilee celebrations, commemorating 60 years of Queen Victoria's reign.[164]

Woodruffe and Crosbie were proprietors of the Maribyrnong Quarrying Company in 1899, the year that Thomas Warr died. It was his eldest son, Thomas Warr junior, who was listed as proprietor of the Maribyrnong Quarrying Company in 1900-1903. The brief list of Maribyrnong residents in the *Melbourne Directory* gives some clues on later occupants of the study area. It appears that the slaughter house in the study area was let to a series of butchers: T. Butcher, 'slaughterman', (1896); Dundas & Beck, slaughterhouse, (1898-99); Murdoch & King , slaughterhouse (1899-1901). "Slaughterhouse - vacant' was listed under the heading 'Warr's Road, between 'Warr, Thos.' and 'Maribyrnong Quarrying Company. In the years 1904-5, 'R.W. Wyett, piggery' is listed.[165]

By 1906, the Presbyterian Church of Victoria was the owners of about 180 acres of land which had formerly been Warrs' and, before that, the Melbourne Meat Preserving Company's land. The items listed in the ratebooks included 12 cottages, factory and quarries. The quarries comprised just over two acres and had a net annual value of £200, almost equivalent in value to the factory buildings and 170 acres of land, which had a combined net annual value of £205.[166] The Presbyterian Church remained owner of the study area for another nine years. Possibly they purchased the whole property as an investment, with a view to sub-division.

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161 Shire of Braybook ratebooks, 1881-2, 1886-88.
162 Shire of Braybook ratebooks, 1891-2, 1896-7.
163 *Statistical Register of Victoria*, Production, section on quarries, by municipality, 1890-99.
164 Thomas Flynn, ''History of Braybrook District', 1906, entry on Warr.
165 Sands & McDougall, *Melbourne Directory*, 1896-1905.
166 Shire of Braybook ratebooks, 1906-7. See also Titles Office records.

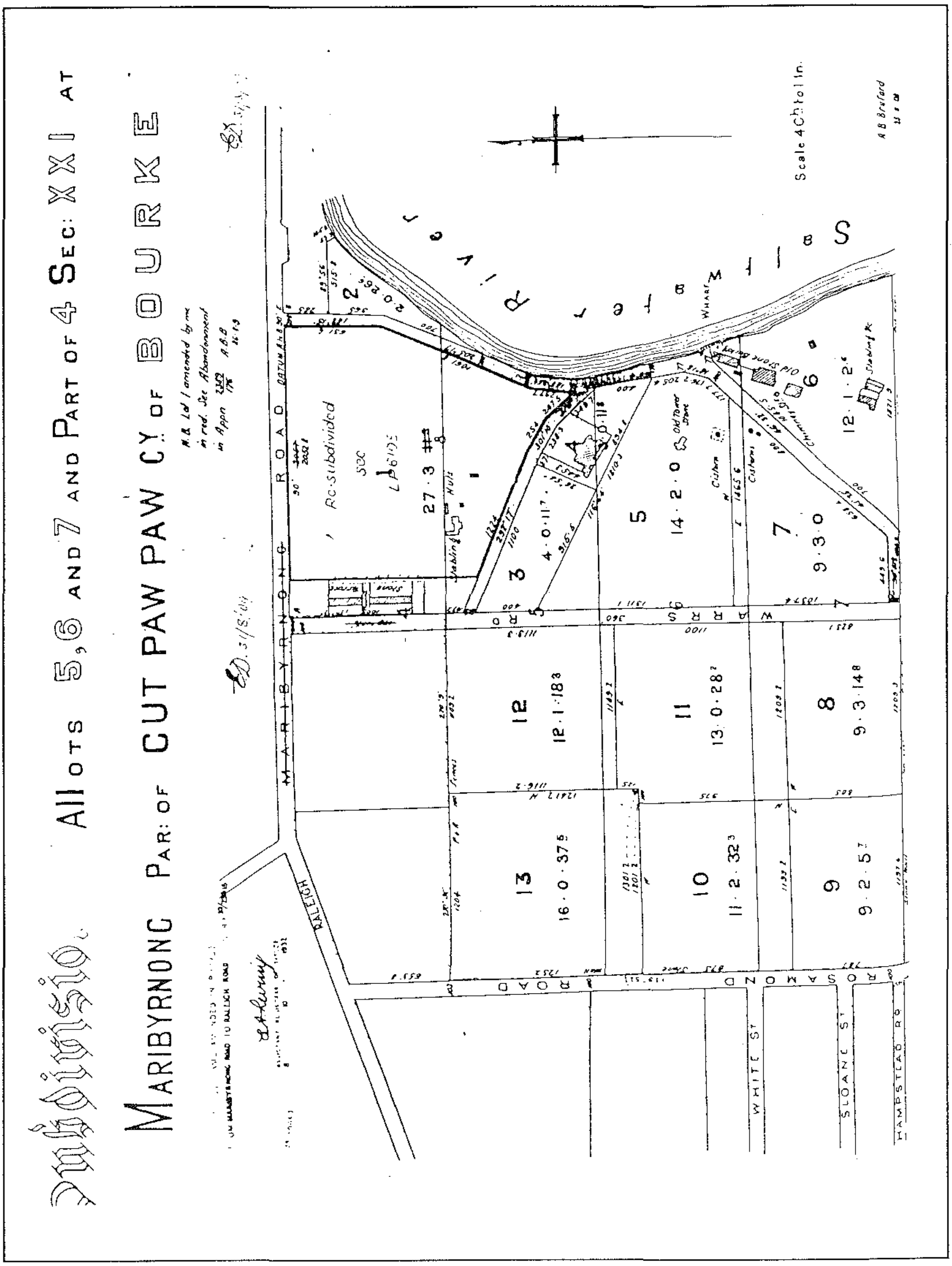

Figure 9. Plan of proposed subdivision in Maribyrnong, 1908.[167]

[167] 'Subdivision of Allots. 5,6 and 7 and Part of 4, Sec.XXI, Maribyrnong, Parish of Cut Paw Paw., 1908'. La Trobe collection, State Library of Victoria.

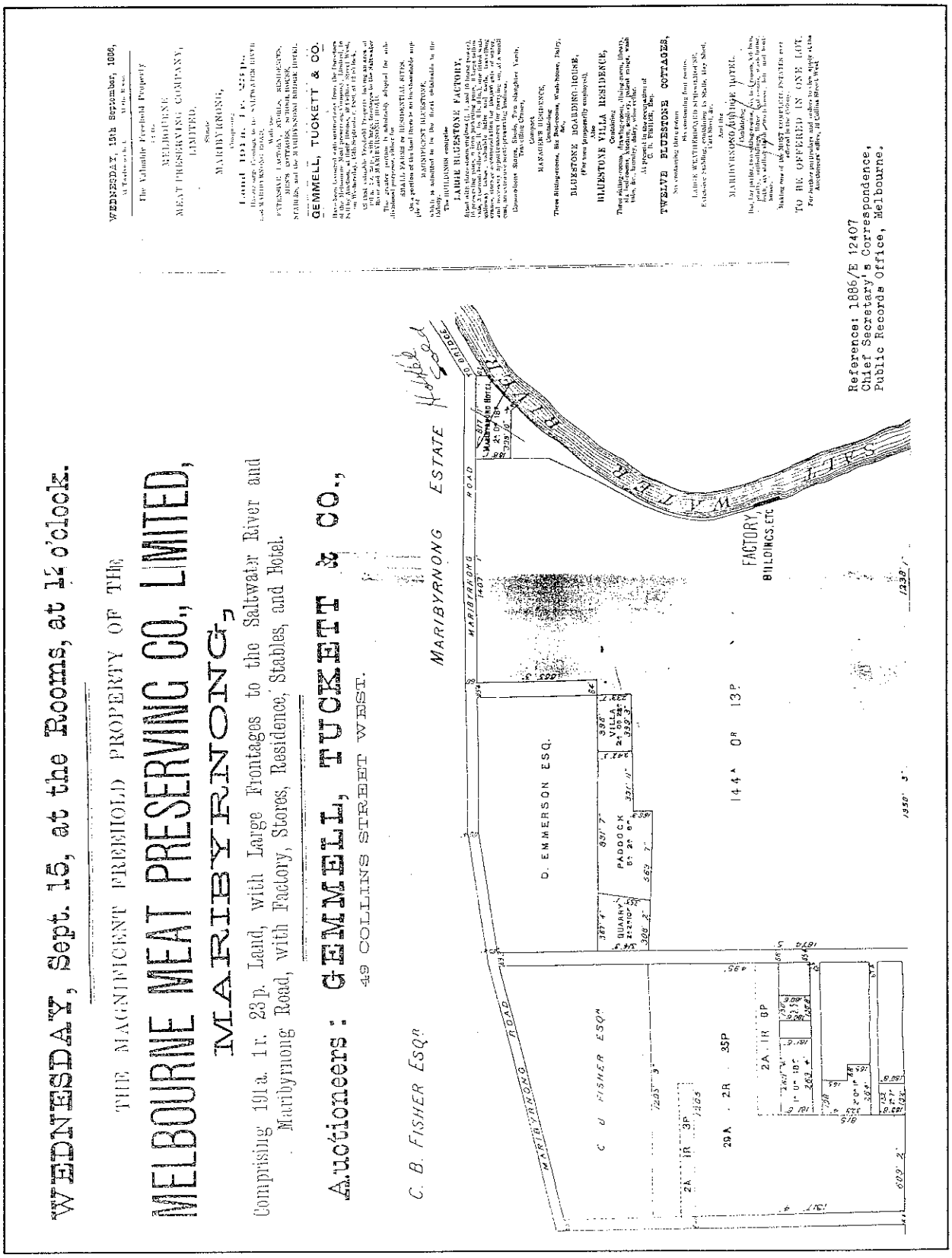

Figure 8. Auction notice for Melbourne Meat Preserving Company property 1886.[160]

[160] Chief Secretary's Correspondence, 1886/E 12407, Public Records Office, Melbourne.

A sub-division plan of 1908 shows Portions 5, 6 and 7 and part of Portion 4, Section 21, divided into 13 lots. The study area comprises one lot of 12 acres. No quarries are shown, but the plan does show the stone terrace of former company housing (the 12 cottages, a substantial house , which would have been Warr's house, 'Old Tower, Stone' and three 'Old Stone Buildings' in the study area, near the river.[168] The study area may have been unused for some time. An entry in the 1908 Melbourne Directory lists residents in Maribyrnong Road, south side and includes a reference to 'Entrance to vacant meat preserving works.'[169]

During these years the terrace of cottages saw a succession of occupants, but at times some of the cottages were vacant, probably because of the depressed times. The hotel, which had once been owned by the Melbourne Meat Preserving Company, had been sold to Charles Spong, about 1886 and was now known as the 'Bridge Hotel', or Spong's Hotel. The castle remained on the hill, though increasingly derelict. A move to raise funds for its repair, about 1910-1911, was unsuccessful. It became known as the haunted castle and was the subject of a poem by a lady poet in Footscray. Some of the quarries changed hands. One of the big quarries was bought by H. Rowe and finally became the property of Essendon Council, as a municipal quarry.

Hume Bros. Cement Iron Company 1910-1920

The ground-breaking centrifugal process for making concrete pipes was developed in South Australia, where Walter Reginald Hume and his brother Edward J. Hume were running a small business in Flinders Street, Adelaide, making fencing, droppers and doing general metal work repairs. There were seven to eight employees and a small machine shop in Roper Street. Here Walter Hume had developed and patented a centrifugal paint-dipping machine, 'a fearsome structure', to paint ornamental steel fencing and other work. He came up with the idea of applying centrifugal force to the manufacture of concrete pipes and undertook experimental work, with the help of his wife. The experiments were promising. The next step was to raise money and this led to the formation of the Hume Bros. Cement Iron Co, in Adelaide in 1910. The Hume brothers had 40 of the 60 shares. Australian patent applications were lodged and also numerous overseas applications. Then came 'the anxious period of proving the development of the invention' and the lodging of new patents to cover the improvements.

The new syndicate purchased some cheap land and established the first works site at Mile End, a 20-acre site west of Adelaide (later known as the Keswick works). Here a small plant and building were erected and the first centrifugally-spun concrete pipes made in February 1911. At first, it was difficult to get contracts, but during November 1911 the tide turned. Three large contracts came in and these were handled successfully.[170] According to Rob Hume, an employee with Hume Bros in Adelaide since about 1906, Tom McIntyre made the machines to carry out the process on a commercial basis. These were moulding machines; large and small reinforcing machines with collapsible drums; a collar machine which made the reinforcements for the collars.

> *Flinders Street (South Australia) was never used for the manufacture of the Concrete Pipes, but merely for the experimental machines for making the first pipes. The first machine was driven by pulleys. Afterwards to get the variable speed we had tapered drums ... In the early days a very small steam engine was used to supply power, and also an old type of rack and pinion gas engine.*[171]

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[168] 'Subdivision of Allots. 5,6 and 7 and Part of 4, Sec.XXI, Maribyrnong, Parish of Cut Paw Paw., 1908'.
[169] Sands & McDougall, *Melbourne Directory*, 1908.
[170] ANU Archives of Business & Labour, Humes Ltd., Deposit 32, 'Early Days of Hume Pipe Co.,: Rough Notes by W.R.Hume (Typescript).
[171] ANU Archives, Humes Ltd., Deposit 32, recollections of employees:Rob Hume, 16, 19 September 1958.

Plate 11. Walter Hume from a company publication.

Fred Hall worked at the factory in Adelaide from 1913 and later recalled that 'Mr W.R. Hume used to come into the yard at Keswick, and quite often take off his coat and help us in our jobs, especially if we were a bit rushed for time'.[172] His account of the conditions at the Adelaide factory is a useful comparative source when looking at the Maribyrnong factory. While the infant enterprise was getting under way Walter Hume was considering expansion. He was aware that there were two firms manufacturing concrete pipes in Victoria, and later recalled the negotiations held with them.

> *One was Richard Taylor and the other the Monier Pipe Co. Taylors were making the old Keilberg pipes with semi-dry sand and cement and the other the Moniers, that is the pipes made on a mandrill with a plastering-on process. The Monier Co. was then controlled by General John Monash and John Gibson. A move was made by Taylors and Moniers to combine and operate the Hume Patents in Victoria, and negotiations were practically concluded at one time. The agreement with Monash was on the whole fair, but if anything benefiting the Melbourne people, but John Gibson, being a Scot, and Mr Taylor even more difficult than a Scot to deal with, sought alterations and conditions in the agreement that made it unacceptable, so negotiations fell through.*[173]

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[172] ANU Archives, Humes Ltd., Deposit 32, recollections of employees: Fred Hall, Adelaide, 27 April 1959.

[173] ANU Archives, Humes Ltd., Deposit 32, 'Further Notes on the days of Hume Pipe Co.' by Mr W.R.Hume.

It is not yet clear whether Walter Hume and his brother extended operations to Victoria after these negotiations with Monier and Taylor fell through. However, it seems that by 1912-13, 'Hume Bros. Cement Iron Works' was established at Maribyrnong, Victoria.[174]Their choice of a site owned by the Presbyterian Church of Victoria on the Maribyrnong River, was no doubt influenced mainly by the presence of a ready supply of bluestone in the area. The availability of substantial buildings and a site of many levels, with possibilities for moving materials by gravitation, was also attractive.[175] The proximity to the river may have been a factor, for its value as a drain, and as a means of transport.

At the time, the main bluestone quarry in the area that is now Highpoint, was leased by the City of Essendon for its municipal quarry. The land leased by the Hume brothers included the study area, but also some acres of land now covered by housing. The Hume firm soon developed some of this land, known locally at the time as 'Humes' Paddock', as a quarry. Also on the firm's land was a substantial residence, which was occupied by Walter Hume and his family from 1915.

The earliest accounts of the Maribyrnong factory in this early period come from the recollections of some of the men who worked there, told forty years later. One of these was Murray Butcher, who first began work at Maribyrnong in 1916, when it was 'Humes Bros.'

> *At times great difficulties were experienced with Cement and Sand. The Sand brought to Maribyrnong had, very often, a high percentage of clay, which retarded the 'setting' time. However, when we were using Ciment Fondu, this type of sand assisted in the moulding, as the Ciment Fondu was a very rapid setting cement. Later on arrangements were made to have the Sand washed and this was an improvement.*[176]

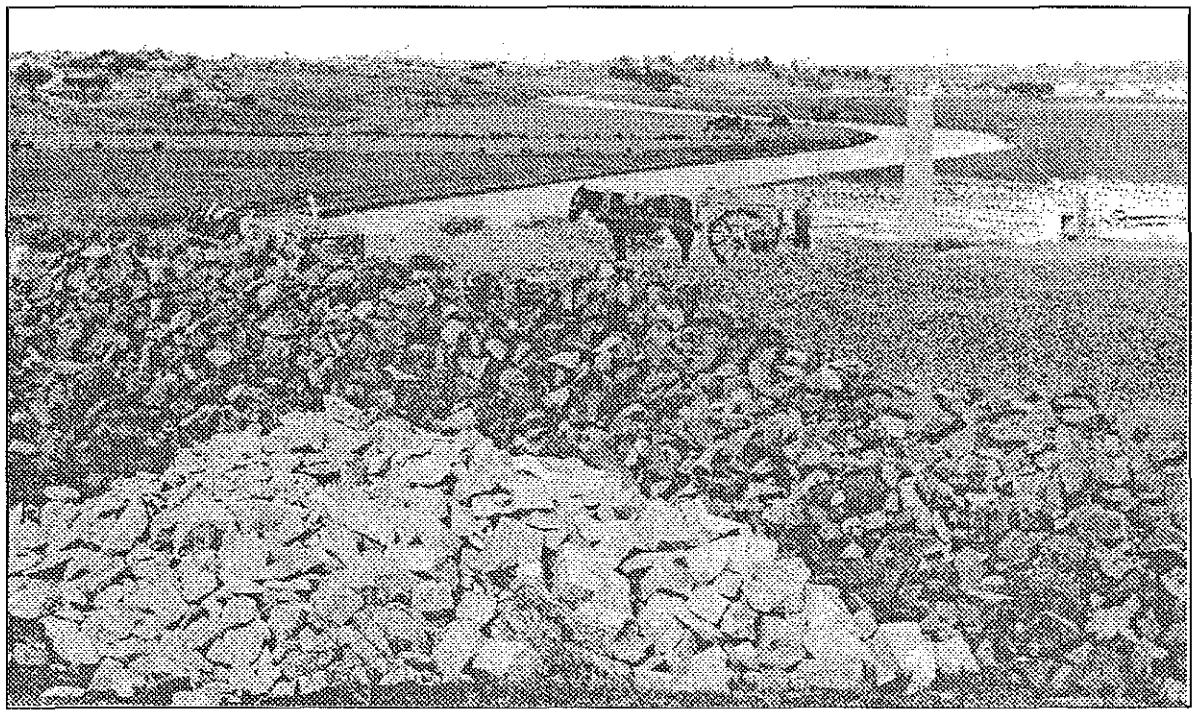

Plate 12. Stone cart and spalls at quarry above the pipe factory c.1920.[177]

[174] Sands & McDougall Melbourne Directories, 1914, entry listed under 'Maribyrnong', in Van Ness Avenue. See also G.D.Snooks, 'Hume Enterprises in Australia, 1910-1940: A Study in Micro-economic Growth', Ph.D. thesis, A.N.U., 1971), p.. 75, 126, 129. Snooks states that , in 1914, J. Monash and J. Gibson formed a company called Concrete Constructions Pty. Ltd., to specialise in the production of reinforced concrete pipes just after Hume Bros. had established a factory at Maribyrnong.

[175] Mr.Reg. Hume, personal communication, 17 September 1996.

[176] ANU Archives, Humes Ltd., Deposit 32, recollections of employees 1958-59: Murray Butcher, Keswick, S.A.

[177] Hume Pipe Company Album, held by Melbourne's Living Museum of the West, Inc.

In 1931 - during the Depression years - I had one week in the Office and one week in the Yard, and had to pull my weight. I was expected to do as good a job in the yard or factory as the well seasoned and experienced process worker, or even better. While in the Office the clerical work had piled up, and this had to be tackled and everything done as though I had been engaged on the clerical work constantly.[215]

Leased land

With the expansion of operations in the 1920s-30s storage space for the pipes produced became a problem. From 1935, the Hume Pipe Company leased five acres adjoining its southern boundary, from the Department of the Interior, on Commonwealth land south of the 'Bottom Factory'.[216] According to the terms of the lease, this could only be used for storage and stacking of pipes.

Summary: growth and expansion of the Humes firm, 1920-39

The growth in plant and buildings which occurred at the Maribyrnong factory in the 1920s-1930s can be seen as representing, in miniature, the growth of Hume enterprises across Australia and the world. G.D. Snooks has analysed the growth of the Hume firm in a thesis of 521 pages. His own words provide a useful summary of the significance of that growth:

It was the only Australian firm of the pre-World War II period to pioneer a new technology (for the manufacture of concrete and steel pipes) and to export its innovations throughout the world. The latter mainly involved the sale of patent rights to companies in Europe, North and South America, Asia, Africa and the islands of the Pacific; but also included the export of specialised machinery which was produced in the firm's own engineering workshops. Therefore Humes exported capital and technology at a time when other Australian firms were doing the reverse. Apart from contributing to the growth of this firm, the innovations of W.R. Hume, the founder-inventor of Hume enterprises, had an important impact upon the growth of Australian urbanisation during these years. Hume was instrumental in stimulating public authorities in Australia and other parts of the world to adopt, for widespread use in the construction of water, sewerage and drainage facilities, a new and more economical input - the reinforced concrete pipe. As this occurred during a period when these facilities were constructed on an extensive scale in the urban and rural areas of Australia, there was a considerable reduction in the cost to society of this type of social overhead capital.[217]

The Hume Pipe Company's factory at Maribyrnong was Victoria's leading concrete pipe factory at a time of large-scale public construction projects but also one of a very large number of Hume factories. G.D. Snooks suggests that the main growth of the Humes firm in the 1920s was in South Australia. However, Snooks also shows that the use of concrete pipes was increasing rapidly in Victoria and that, by the end of the 1920s, 83% of the MMBW's purchase of sewerage pipes were concrete pipes. It is likely that these were made at Maribyrnong. He points out that: 'In Victoria, one of the few states where public expenditure increased rapidly in the second half of the '20s, expansion activity took place at Maribyrnong and also in the rural areas'.[218] He further notes that 'Victorian recovery began in 1932-33 due to an increase in production at Maribyrnong and the beginning of rural expansion.[219]

Moreover, it can be argued that the study area played a special role in the development of some of the innovations and improvements in concrete pipe manufacture, since the founder/inventor was not slow to take up and use, even patent, the ideas of his employees. The Maribyrnong factory was also an important training ground for many personnel who stayed with the Hume

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215 ANU Archives, Humes Ltd., recollections of Gerald Kelly, 16 July 1959.

216 Victorian Office Deed Register, lease dated 24 January 1935. Information supplied by G.Shirwood.

217 G.D.Snooks, ''Innovation and the Growth of the Firm: Hume Enterprises 1910-40', in *Australian Economic History Review*, No.13, 1973, pp.16-17.

218 G.D.Snooks, p. 131. During the 1920s, W.R.Hume claimed that the large plant at Cobdogla, in the River Murray irrigation area near Renmark, was ' the largest pipe-making plant in the world'.

219 G.D.Snooks, p. 135.

In the very early days in Adelaide, cement was imported from Denmark in 500 or 600 pound barrels. But the war put a stop to such trade. Murray Butcher remembered instead that at Maribyrnong: 'All the cement at that time came in jute bags, which weighed about 127 pounds each bag. These often had to be carried long distances to the Stacking position, and this was very heavy and dirty work, as cement came through the bags when being carried'.[178]

The supply of reinforcement wire was another problem. In 1916, and for quite a number of years afterwards, reinforcements for the pipes were made from:

> *... tram and mining cables , which were brought to Maribyrnong on two horse drawn lorries, side by side, then coiled in the factory on to timber and firewood. All the cable had to be burned to soften or anneal the wire. The cable was then cut into 75 yard lengths, unravelled, stretched and spooled into coils.*[179]

The earliest known photo of the study area after occupation by the Humes firm, possibly taken abut 1920, shows the three bluestone buildings at the northern end of the site (which still remain) and a fourth building, beyond the present Visitor Centre, which no longer survives. There is also a small bluestone building at the rear of the space between Buildings 1 and 2, which still survives and a small building in front of the main bluestone building which appears in photos of the meat cannery and was possibly an office. The chimney is still standing and there appears to be a wharf jutting out into the river. On the hill above the study area, there are sheds, a chute, a stone crusher and the ruins of the old 'castle'. There is no sign of other newly constructed buildings. The ground is covered with stacks of pipes and the words 'HUME PIPE' have been constructed using pipes. Of the two figures talking in the centre of the picture, one is undoubtedly Walter Hume. The photo is captioned 'Hume Pipe Co. Ltd. and 'Works Headquarters, Maribyrnong, Victoria. This, together with the arranged pipes, suggests that the picture was taken in 1920, shortly after the formation of the Hume Pipe Company in 1920, possibly in celebration of that event. The photo is important for an understanding of the early years of Hume's factory at Maribyrnong. It provides evidence that the new company used the buildings that were there and did not embark on any extensions until later in the 1920s. Although the photo only shows the northern end of the site, other later photos confirm that there was little building construction in these early years. Even the electricity sub-station does not appear in this photo.

A set of six photos appears in a promotional booklet, published in 1920, just after the change to a public company, Hume Pipe Company.(Australia) Limited. Harry Pearce, who worked at the factory 1919-1920, was presented with a copy by the firm and has indicated that five of the six photos relate to the Maribyrnong works. The photos, combined with the recollections of former employees, make it possible to reconstruct the main stages of production during the early pioneering period.

1) Spalling the stone in the quarry on Maribyrnong Hill
2) Coarse crushing, in a large crusher on the hill above the factory
3) Fine crushing, at the top of the factory, just outside the back of the main bluestone building
4) Mixing the concrete: inside the main bluestone building, possibly on the upper level
   (This photo seems to show an open mezzanine floor at the southern end of the building)
5) Moulding the pipes, on the bottom level of the main bluestone building
6) Delivering the pipes: on horse-drawn carts

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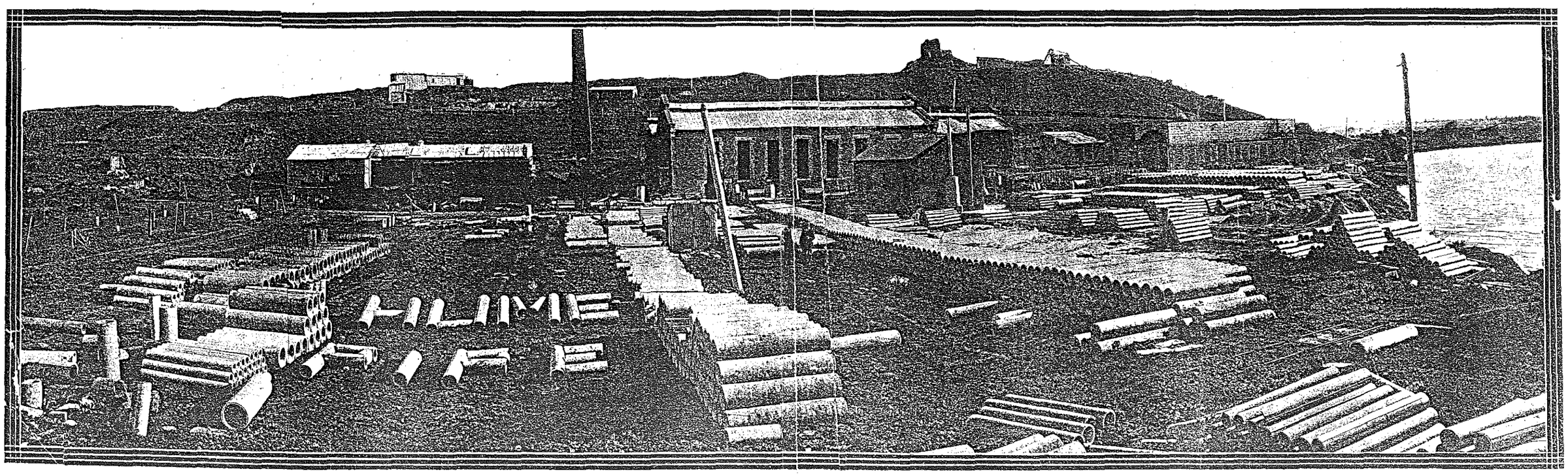
[177] Hume Pipe Company Album, held by Melbourne's Living Museum of the West, Inc.
[178] ANU Archives, Humes Ltd., recollections of Murray Butcher.
[179] ANU Archives, Humes Ltd., recollections of Murray Butcher.

THE HUME PIPE COMPANY LIMITED



Works Headquarters: Maribyrnong, Victoria. Extent, 26 Acres, Freehold.
Manufacturing all grades and sizes of Hume Pipes.

Plate 13. "Hume Pipe Company Ltd: Works Headquarters, Maribyrnong, Victoria." c.1920.[180]

[180] From the collection of the former firm, Humes Limited.

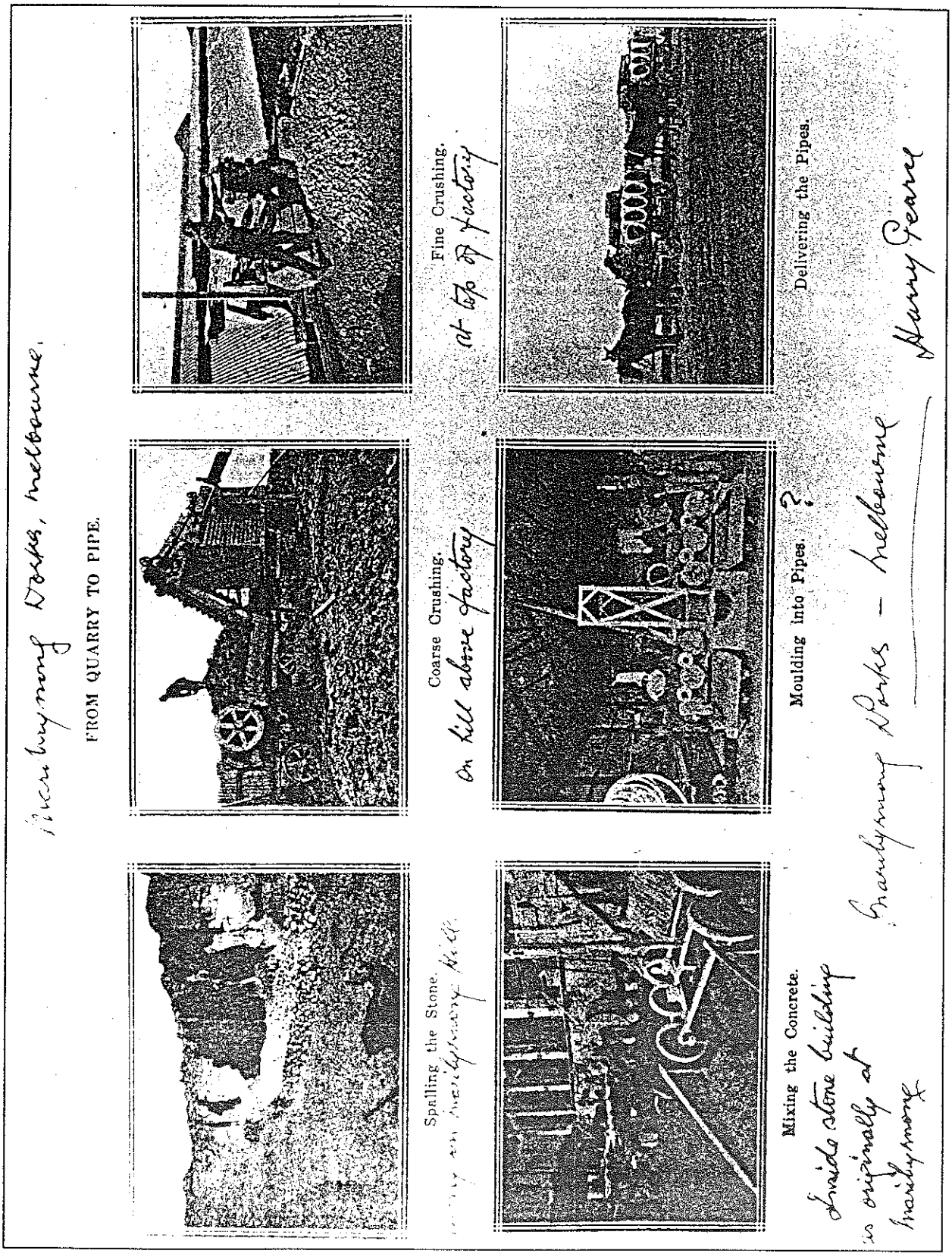


Plate 14. From quarry to pipe, Hume Pipe Company (Australia) Ltd.[181]

181 Company publication *Hume Pipe Company (Australia) Ltd.* dated July 1920, from the collection of Harry Pearce, annotated by him "Maribyrnong Works, Melbourne". (One of the photos does not appear to relate to the Maribyrnong site and has a question mark).

Harry Pearce came to work at Humes, Maribyrnong in February 1919. He had come from his home in Creswick to stay with relatives in Melbourne and was looking for a job. He answered an advertisement by Hume Bros. in the *Age*, for a 'smart labourer'. Mr Gordon was manager. He was given the job of de-stranding cables, but did many tasks: 'You had to be a jack of all trades in those days'.[182] In 1982 he re-visited the study area and described some of the main processes, outlined in the following section.[183]

Concrete mixing

Fine stone-crushing was done outside the upper level of the main bluestone building, It seems that sand as well as crushed bluestone metal was initially stored in bins outside the upper level. From the evidence of the 1920 photograph, the crushed stone then went down a chute from the bottom of the crusher, through a wooden opening, to bins located on the upper level of the building. There were two concrete mixers on this level, according to Harry Pearce, who also remembered carrying heavy bags of cement, from the ground floor, up a flight of steps to this upper level. There were 14 bags to a ton. This means one bag weighed 160 lbs. The man on the mixer had to come to the bins and measure out the correct proportions of sand and metal and carry this over to the mixer to combine with the cement (and water).

Reinforcement making

The reinforcement machine was also on the upper level at this time, at the southern end of the building, according to Harry Pearce. The function of the 'reo' machine was to weave the wire into a spirally-wound, longitudinally-braced steel cage, the same length as the pipe. Different types of reinforcements were made for different purposes. The machine could be adjusted to space the spirals. Murray Butcher recalled that reinforcements in the early days gave much trouble. They were 'the old mechanical type' made on an expanding or collapsible drum. 'First the reinforcements were made of 4-6 inch pitches and eight streights, but later diagonal wires were added which made the reinforcements more rigid'. Les Markey, who was 17 years old when he started working for Hume Bros. in 1919, remembered that reinforcements were made at the factory on a machine called 'the Sausage Machine'. Tom Rennard, who started at the factory in 1920, called it the 'Hurdy Gurdy Reo Machine'.

Moulding machines

At that time, the factory only had two moulding machines. These were both located in the main bluestone building on the lower level. Murray Butcher recalled that they were six-foot machines, one for the smaller diameter pipes and the other for pipes 12 inches to 42 inches in diameter. 'Both machines were of the old cone drive type. The cones being about three feet long, and tapered from about four inches to twelve inches, and set in reverse at the back of the machine... the belt had to be pushed up the cone by hand to get the required speed, then pulled back again to stop the machine'. Harry Pearce remembered that Machine No.1, making the big pipes, was under the second arch and Machine No.2, for the smaller pipes, was under the fourth arch. Electricity was being used in 1919. The plant was driven by electric motor. He has also described how the early pipes were a straight barrel. There was no faucet. They had to make the join by means of a collar, concreted on.[184]

> *At that time the work was very hard, and all pipes made on the 6 foot machine had to be lifted off by hand, and stacked in tiers on trucks, ready for the steam chamber. The number of Moulds on each truck depended on the size of pipes: For instance, eight 12 inch by 6 foot Moulds to each truck.*[185]

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[182] ANU Archives, Humes Ltd., recollections of Harry Pearce, 18 September 1958.

[183] Harry H.Pearce, interview with Olwen Ford, 4 October 1982. Further references in this section are based on notes made during this interview and subsequent discussions with Harry Pearce. He left Maribyrnong in 1921 on being transferred to Tasmania. Later he was sent to New Zealand and returned to Maribyrnong in 1938, where he remained until 1965. His total period of service wth the Hume firm was 46 years.

[184] Notes on interview with Harry Pearce, 4 October 1982.

[185] ANU Archives, Humes Ltd., recollections of Murray Butcher.

Steam chambers

Harry Pearce remembered the steam chambers, used for curing the pipes, as being very primitive in the early days. Steam was provided within the steam chamber by lighting a fire under pans of water. [186] Steam chambers were located outside the front of Building 2 and also in the area between Buildings 1 and 2. (See plan of c. 1939 which shows steam chambers 'Not used'). Sidney Sewell, who joined the Hume Pipe Company at Maribyrnong in 1923, later recalled that the steam chambers 'left a lot to be desired'.[187] It is possible that the company made use of the meat cannery's tramline system to move pipes on 'trucks' or trolleys. The method used at Maribyrnong was probably very similar to that followed at the Tasmanian factory and described by C. Mason, who began working for the Hume firm in 1920.

> *A truck was loaded with pipes having one row on top of another, with wood in between. This truck with the pipes was stored in the Steam Chamber, and in the following morning was taken out, [and] run down the yard, where the men stripped the pipes.*[188]

Stripping and assembling

This involved taking the pipes out of the moulds, after their curing in the steam chamber. This was not an easy job, according to Fred Hall of the Adelaide factory:

> *The moulds used for pipemaking at that time were of very thin gauge iron, and they were so very easily put out of shape. We put a strip over the moulds and held it with clips ... to get the pipe out of the mould, that was the 30 inch and 36 inch diameter sizes, we had to stand the pipe up straight, and pull the mould off with a block.*[189]

With smaller moulds, according to Fred Hall: 'The mould being made of one piece of metal, whenever the keys were taken out, the moulds sprung open'. When 16 year-old Tom Rennard started at the factory in 1920, his first job was to grease moulds.

> *I used to carry the moulds on my shoulders, and being only a little chap could only carry so many at a time. Mr Webberley was Works Manager at Maribyrnong, and thought with aid of a wheelbarrow I could cart many more moulds. Jack Phillips made a wheelbarrow, and this barrow was filled to its utmost capacity. Alas, I could not push the barrow, and Mr Webberley considered I was 'lying down on the job'.*[190]

W.R. Hume himself had recognised the problem of concrete sticking to the mould, even after greasing of the mould.

> *The concrete made centrifugally stuck so hard and so fast to the mould that even weeks after it could not be parted cleanly. This puzzled me considerably, and very many tests failed to solve the difficulty. Even in spite of our wide knowledge, the sticking of certain concrete to certain moulds ... continues, and I have not found the cause or any really good solution of the trouble.*[191]

De-stranding

De-stranding was done outside in the area known as 'the chicken run'. Many of those starting at Humes in the early days had to work on de-stranding tramway cables for reinforcements. Harry Pearce was one of these and later recalled: 'It was a fairly tough job even for that period'.[192] According to Reg Clancy, the wire used to be from the Fitter's Shop almost to the river bank. About five or six men were in the 'wire gang'.

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186 Notes on interview with Harry Pearce, 4 October 1982.
187 ANU Archives, Humes Ltd., recollections of Sidney Sewell, 9 April 1959.
188 ANU Archives, Humes Ltd., recollections of C. Mason.
189 ANU Archives, Humes Ltd., recollections of Fred Hall.
190 ANU Archives, Humes Ltd., recollections of Tom Rennard, October 1958.
191 ANU Archives: 'Early Days of Hume Pipe Co.: Rough Notes by W.R.Hume, p.4.
192 ANU Archives, Humes Ltd., recollections of Harry Pearce, 18 September 1958.

Conditions at the Maribyrnong factory

Reg. Clancy commenced work with Hume Bros. in October 1916, near Pakenham and worked on a number of pipe contracts around the outskirts of Melbourne.

> *I then was transferred to Maribyrnong as Foreman and what a job! The factory had been mismanaged and was in a dreadful state, and to improve the factory entailed a lot of very hard work. There were no mobile cranes to do the hard work in those days and the men that held their jobs had to be very good. For many years we had to learn the hard way and in spite of many set-backs we struggled on and somehow won through.*
>
> *The staff hands of those days would make the 'cow cockies' of today blush with shame; for if any breakdown occurred, we just had to carry on, no matter how long, until everything was ready for production. Such a thing as overtime rates was never heard of, and men worked early and late without being paid any extra wages whatsoever.*[193]

The factory had quite a small workforce at this time, about 14 or 15 when George D'Elton started there in 1921. Harry Pearce recalled some of the difficulties sixty years later:

> *Humes was struggling in 1919. The men were given time off frequently - a week off now and then. The men knew there were financial difficulties. The firm used to explain the time off was because of a shortage of wire. Probably it was really because of a shortage of money.*

Field plants

A basic principle of the Hume firm's mode of operation in this period was the making and installation of pipes 'on-site', thereby reducing transport costs and utilising local labour. The Maribyrnong factory, like other metropolitan Hume factories, was the base headquarters for such activity. Murray Butcher later recalled that the layout of field plants was nearly always the same: 'Twin Steam Chambers with traversing truck in front of the moulders. The Moulder, Reinforcement Machine and Collar Machine came all assembled'.

Productivity

G.D. Snooks' study of the Hume firm, stresses that the firm grew rapidly up to the end of World War One. As the second factory established by the firm, the Maribyrnong factory was part of the early expansion. In Victoria, Hume pipes comprised 15.53% of the public use of pipes, 1918-19, while in 1920-21 their share of public use was 14.23%. In 1916 a third factory was established in Tasmania, where Hume pipes soon made up a large proportion of public use pipes. [194]

> *This growth was based upon W.R. Hume's 1910 invention and its subsequent modification over the following few years. Once the qualities of the Hume pipe had been recognised, public authorities throughout Australia (and the world) gradually substituted it for those pipes they had previously used.* [195]

In the immediate post-war years, according to Snooks, further growth was restricted by both organisational and financial limitations. These factors contributed to the formation of the new Hume Pipe Company (Australia) Ltd. in 1920 and to a new period of expansion.

In this early period, the study area became a significant base for Walter Hume and the Hume firm. His brother remained in Adelaide. Walter Hume himself was frequently overseas, investigating new commercial possibilities. The physical appearance of the study area did not change greatly during the years 1910-20, except perhaps for the demolition of some buildings, notably sheds and stables, and the stacking of concrete pipes everywhere.

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[193] ANU Archives, Humes Ltd., recollections of Reg. Clancy, 9 April 1959.

[194] G.D.Snooks, 'Hume Enterprises in Australia, 1910-1940', p. 74. Taking Australia as a whole, Hume pipes made up 7.24 % of public use of pipes in the years 1918-19 and 9.45% in the years 1920-22. (Snooks, p.72) Further research is needed to discover detailed evidence of the Maribyrnong factory's productivity

[195] G.D.Snooks, 'Hume Enterprises in Australia, 1910-1940', p.381.

The creative energy of this period went into the improvement and marketing of the world-famous invention of the steel-reinforced concrete pipe. In the later period, after 1920, there was considerable building activity which reflected the new phase of innovation and expansion.

Hume Pipe Company (Australia) Limited 1920-1939

A new company, the Hume Pipe Company (Australia) Limited was incorporated in August 1920, with a nominal capital of £500,000.[196] Within a year, the company was reporting new factories at Perth, at Brisbane and at Cobdogla, River Murray, South Australia. A new site was purchased for the Hobart works. At the third meeting of the Board of Directors, on 13 September 1920, it was resolved: 'that the General Manager and Mr E. S. Hume report to the next meeting as to the suitability of the present site of the Company's works'. In the margin is the annotation 'Maribyrnong Works'. No record has yet been located as to the result of this recommendation, but the Maribyrnong Works did continue and did remain the company's main factory in Victoria.

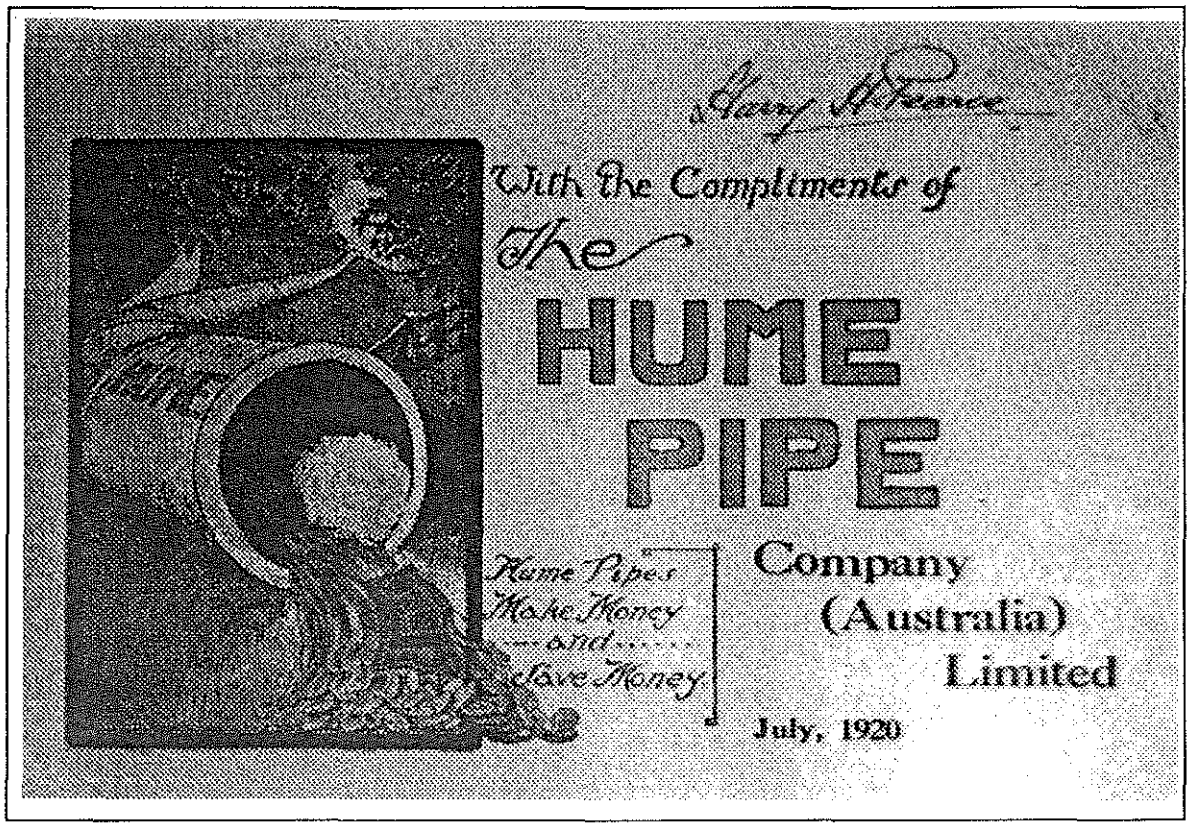

Plate 15. Title page of Hume Pipe Company publication commemorating the incorporation of the firm as a public company in 1920.

[196] The prospectus of the company in 1920 states that: 'The whole of the present issue of 150,000 shares has been underwritten by the Honourable L.J.Clifford, Collins Street, Hobart, Shareholder.' It is worth noting Harry Pearce's comment: 'One of the directors of the company was L.J.Clifford, son of Lord Clifford. Lord Clifford once gave a scientific lecture and I went to hear it. L.J.Clifford was the means of saving the company. He put money into it and this saved the company'.

Within the next five to ten years significant changes occurred in the study area. These included:-

* increase in plant
* construction of an electricity sub-station
* extension of pipemaking activity to a new area, later known as 'the Bottom Factory'
* construction of new sheds
* renovation of Building 3 for use as a reinforcement shed and later for mould storage
* establishment of a slab factory
* construction of a testing room or laboratory, south of Building 2
* use of trucks, instead of horses and drays or carts
* installation by the late 1920s of electrically-operated lifting apparatus
* introduction of a wire-drawing machine
* introduction of improved reinforcement-making machines
* leasing of additional land for pipe storage
* centralisation of some operations, e.g. concrete mixing
* construction of a caretaker's cottage

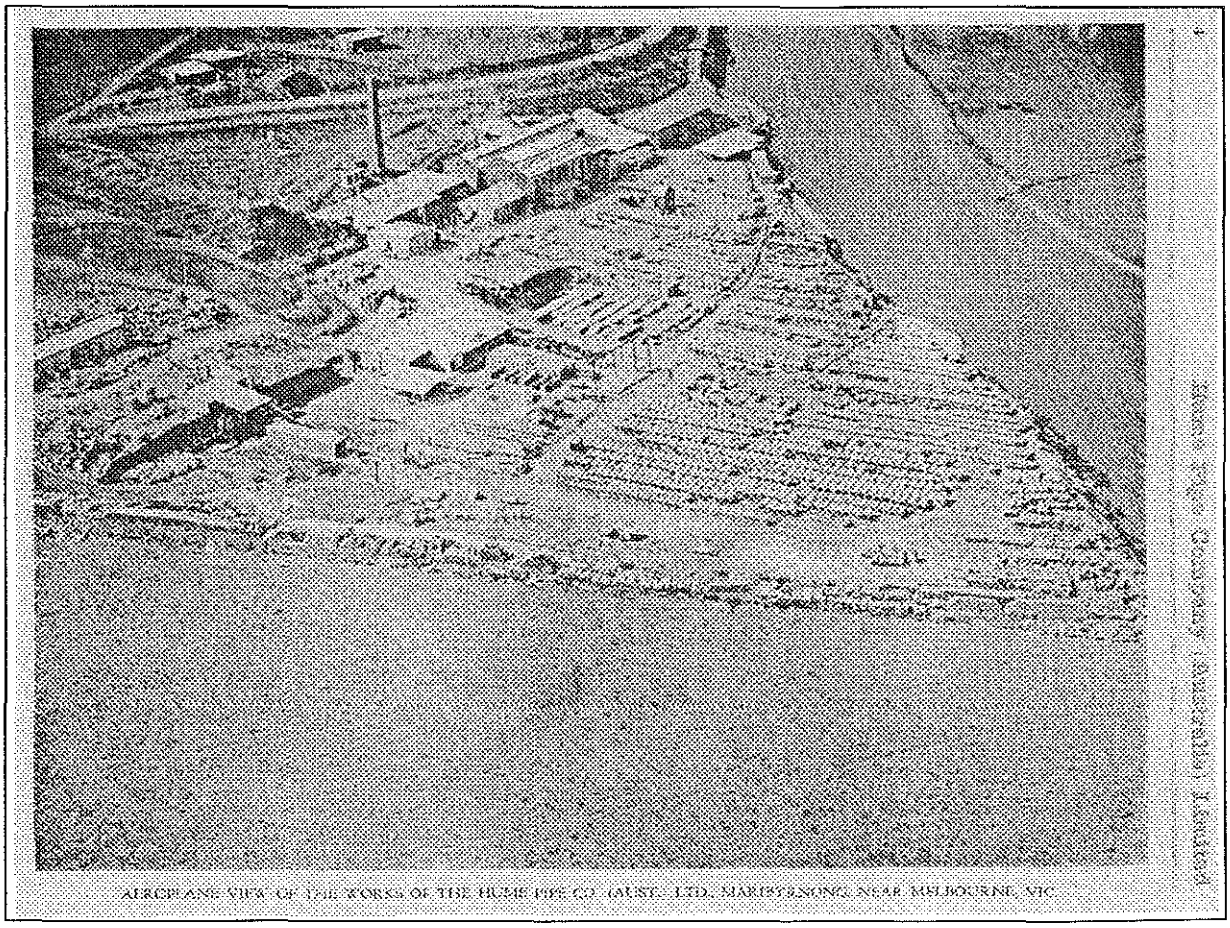

Plate 16. Aeroplane view of the works of the Hume Pipe Company (Aust.) Ltd. Maribyrnong, near Melbourne, Vic. c 1928.[197]

[197] From a company publication describing the firm and its products. Single page in the collection of the Living Museum of the West.

The basic processes remained the same and in many ways the factory at Maribyrnong, as elsewhere, remained quite primitive in its working conditions. Although the new company had a regular monthly *Hume Pipe News*, there does not appear to be a specific article describing the Maribyrnong works. The main sources for an understanding of the study area in this inter-war period are therefore similar to the earlier period: the recollections of former employees, most of whom worked with the company for many years; notes by W.R. Hume; a few photos; a few statistics and some plans of the 1930s.

A long photograph taken in the mid/late 1920s conveys something of the intense activity of the factory and some of the changes. The main bluestone building still stands out in the rear of the photograph, with the annotation 'Moulding Factory'. The chimney and the office are still standing. However, the focus of activity seems to have moved away from the main bluestone building, further south, to the centre of the study area. There are a number of new buildings and sheds, including a moulding shed and steam chamber in part of the area later known as 'the Bottom Factory' (or Building 7) ; a prominent gantry or travelling crane; extensive stacks of pipes and slabs and a convoy of solid-tyred trucks loaded with pipes and slabs. An aerial photo of the 1920s (possibly c. 1926) shows a new open shed and gantry in the area that later became Building 7, new sheds, and pipes everywhere. It also shows a new electricity sub-station. This would have provided the power for the new electrically-operated overhead lifting apparatus which was installed at Maribyrnong in the late 1920s.

Stone crushing

Crushing of stone into half inch and quarter inch 'metal' was an essential part of the concrete pipe-making process. With increased consumption of raw materials, the Maribyrnong factory increased the number of stone crushers, from one Hadfield crusher in 1922 to six in 1927.[198] Some of these crushers were designed and patented by the Hume company itself. An MMBW plan of 1933 shows an increase in the number and extent of quarries in the area during this period. A large crushing plant was outside the study area, nearer Hume's quarry, visible in the 1920 site photograph. A further crushing plant of this period was just below Van Ness Avenue, south west of the present Visitor Centre. This is shown on the plan of 1939. The concrete foundations can still be seen, near the staff car park. A small crushing plant was set up in the area above the road which went past 'Building 7 (where the present bluestone retaining wall is located).

Moulding

The increase in moulding area was accompanied by an increase in the number of moulding machines. During the period 1921/22 to 1937/38 these increased from two to five, according to G.D. Snooks.[199] Two moulding machines remained in Building 2, the main bluestone building, and 6 foot pipes continued to be made here, one machine making the smaller pipes, 4 inch to 9 inch in diameter, one making the bigger pipes, 12 inch to 42 inch in diameter. In the 'new' area that was later termed Building 7, an ever-growing structure of timber and galvanised iron, moulding machines to make 8 foot pipes were installed, one making pipes 27 inch to 48 inch in diameter, the other making pipes 12 inch to 24 inch in diameter. These two machines were close to steam chambers and the casing and uncasing gantry seen in the photographs of the late 1920s. The other moulding machine in this area was a Ring Joint Moulder, with steam chamber close by.

One addition was the four inch Conduit Machine, where Flavell Hills worked on stripping moulds, when he started at the factory in 1923.[200] A Conduit Plant and a Bitumen Plant for Conduits are shown on the 1939 plan, with a steam chamber close by and a 'tramway' leading into the shed. 'The Commonwealth Postmaster General's department showed its confidence in Hume Pipe reinforced conduits by placing large orders with the company for hundreds of miles of conduits for underground telephone lines.[201]

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[198] G.D.Snooks, p. 258.

[199] G.D.Snooks, p. 257.

[200] ANU Archives, Humes Ltd., recollections of Favel Hills, 23 July 1959.

[201] *Hume Pipe News*, August 1925, 'Concrete Conduits for Commonwealth P.M.G.'

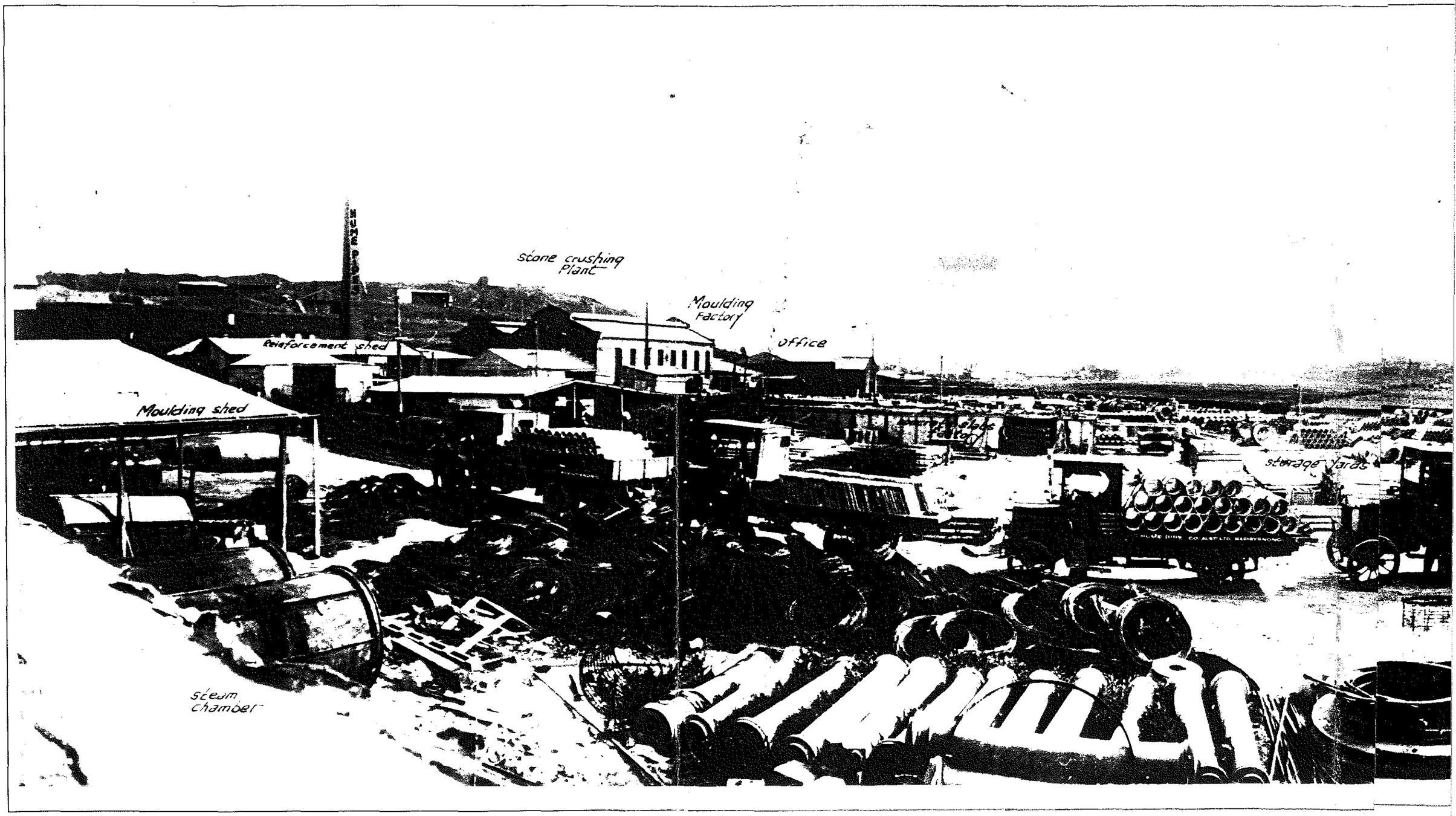
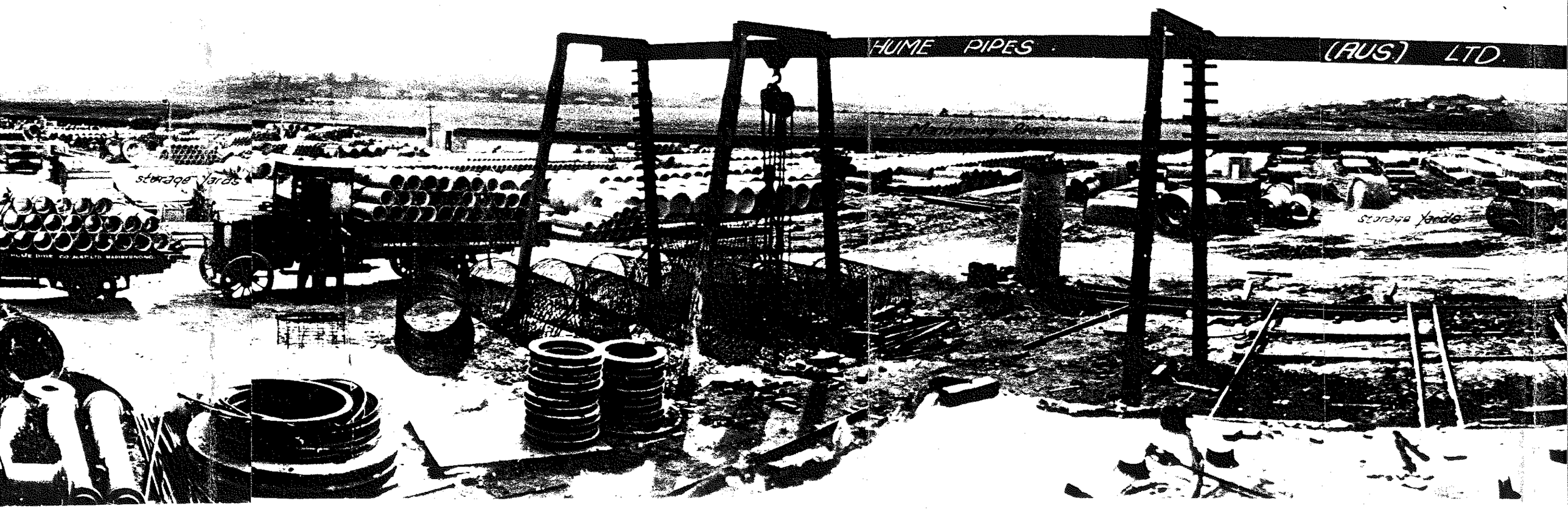
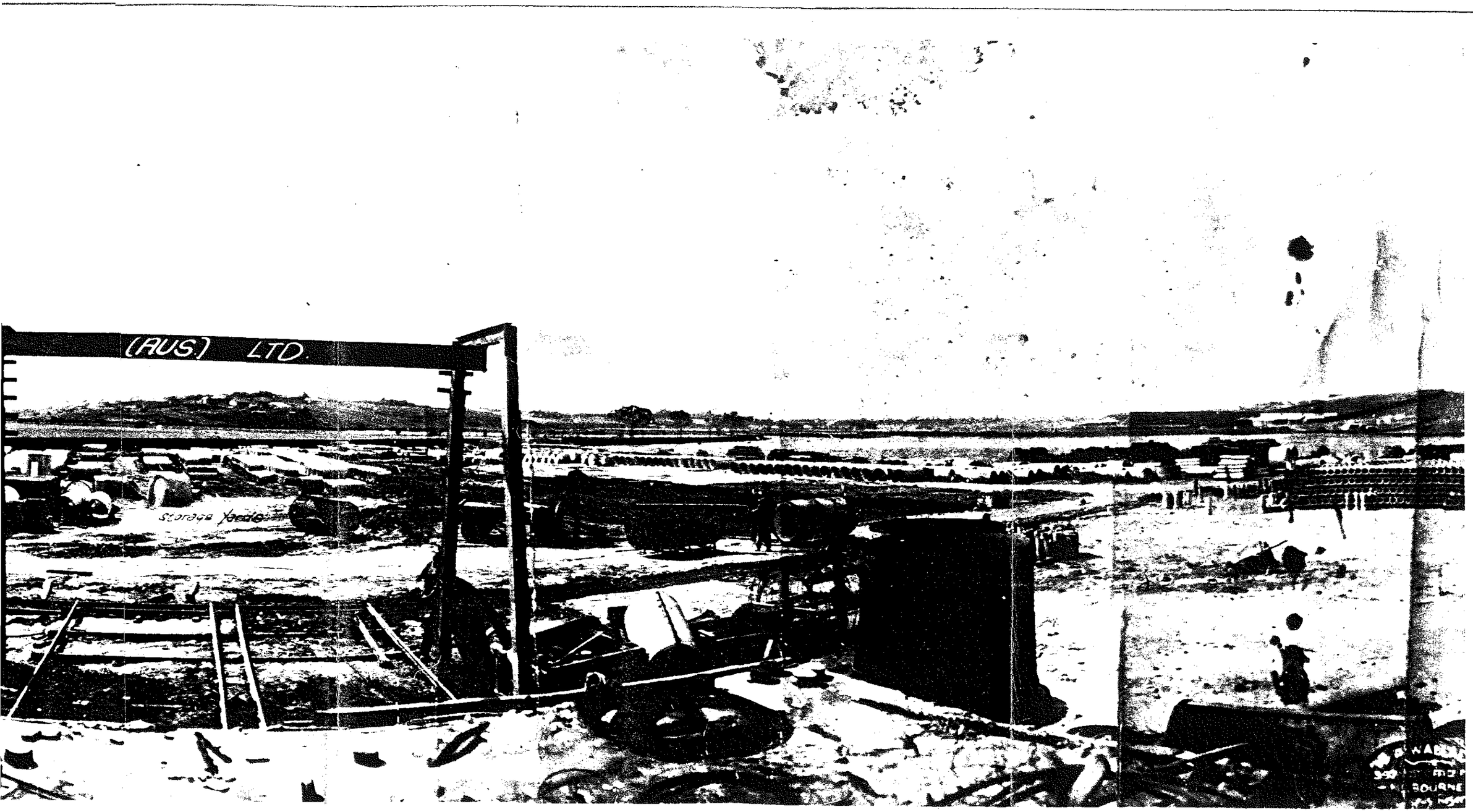


Plate 17. Hume Pipe Coy. Melbourne Branch c.1930.[202]

202 Panoramic Photograph formerly held by Humes Ltd. now in the collection of the Living Museum of the West.

Hume Pipe (Aus.) Coy.
Melbourne Branch




(AUS) LTD.

By the late 1920s, according to G.D. Snooks, 'cement was mixed centrally for use in various operations by using larger machines of the paddle type instead of the smaller rotary type.'[203] At least one of these paddle mixers was placed above Building 7 and poured concrete down two chutes to the lower level. Evidence remains of two pairs of chutes, two for each machine.

The moulds of the early 1920s were remembered by Sidney Sewell, who came to work at Maribyrnong in 1923. His recollections of the hard conditions and the improvements provide valuable evidence of this innovative and yet still primitive period :

> *Moving all materials or finished pipes was all done by hand, and was very tough work for the men. No lifting tackle of any sort at Maribyrnong. The early mould cases were made from Galvanised Iron or Sheet Metal, about half an inch thick. The pipes were not perfectly round, as the moulds dented or were put out of alignment so easily and were forever coming back to the Fitter's Shop for hurried repairs. Later of course a big improvement was made on the moulds, and also in the manner of uncasing them.*
>
> *We had our own trucks when I started at Maribyrnong - solid tyred A.E.C. and Thorneycroft. Paddy Farnan was one of the drivers. The drivers had to load their own trucks, as well as drive them. Our drivers had to bring in the sand from Beaconsfield, and this sand had to be shovelled on and off the trucks. Cement had to be trucked whenever and wherever it was required, owing to lack of lifting tackle ...*
>
> *I was at Maribyrnong at the start of the bumping process. While this showed improvement in the concrete pipes, nevertheless, the wear and tear on the machine was terrific. The Machine was re-designed, and this helped to overcome some of the trouble.*[204]

A plan of a moulding machine, dated 1938, a time of major change in the lay-out of the factory from previous years. The moulding machine was for pipes 15 inch to 39 inch, by eight foot.

Reinforcement-making

During the period 1920-39 the number and quality of reinforcement machines increased considerably. One machine, making 4 inch to 18 inch reinforcements, remained in Building 2. The introduction of a continuous 'Reo Machine' was seen as a big improvement and turned out very good welded reinforcements more cheaply. In the 1939 plan, a continuous reinforcement machine is located in Building 7. There were also two other reinforcement machines in this area(21 inch to 48 inch and 15 inch to 18 inch) and also a 'Collar Reinforcement Machine'. Walter Hume had taken out his first patent for a machine to weave wire reinforcement cages in 1911. A further eight patents recording improvements were taken out in 1923, 1929, 1930, 1931, 1938 and 1939, three of which were authored by Walter Hume himself, according to G.D. Snooks. Wire straightening machines were also in use at Maribyrnong in the 1930s, one in the area between Buildings 2 and 3, one in Building 7.

Wire-Drawing machine

The first wire-drawing machines were installed at Maribyrnong, in 1933-34. Acid tanks, for de-scaling the wire, and a drying oven were also installed in the 1930s.[205]

Testing areas

These included a 'Testing Department' next to the Conduit Plant and an external pressure testing machine, for use with hydraulic pipes. The pressure testing machine was near the seasoning tanks, located not far from the river. High pressure water pipes went into a water bath for seven days, then were cured under the hose for 28 days. 'At that time', recalled Sidney Sewell, 'the water was pumped out of the Maribyrnong (Salt) River. Later it was found that the salt water was affecting the pipes instead of improving them.'[206]

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[203] G.D.Snooks, p. 258.

[204] ANU Archives, Humes Ltd., recollections of S. Sewell.

[205] G.D.Snooks, p. 258. See also 1939 plan of the 'Bottom Factory' or 'Building 6'.

[206] ANU Archives, Humes Ltd., recollections of S. Sewell.

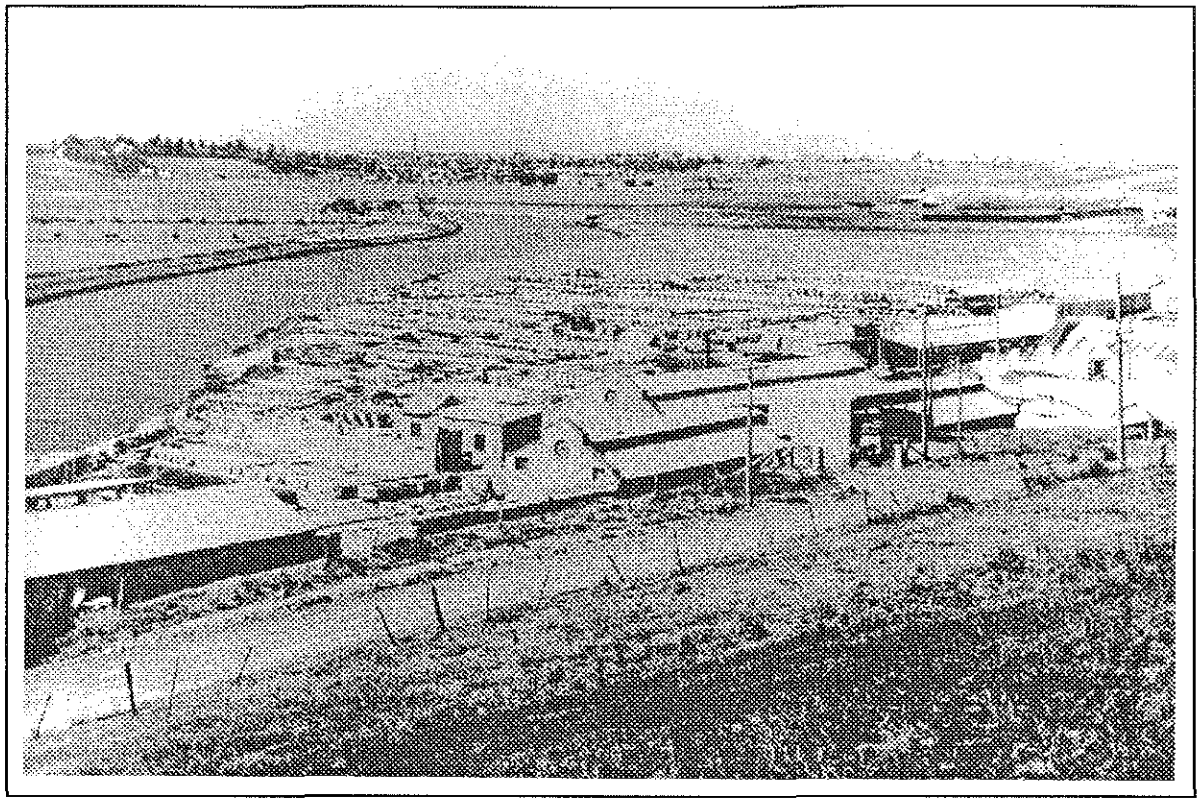

Plate 18. General View of Maribyrnong Works, c1930.[207]

Testing laboratory

A notable part of the Maribyrnong factory was the testing laboratory, in the area adjoining the exterior southern wall of Building 2. It was probably added in the early 1920s. The chemist, J. Turnbull, spent long hours supervising all testing and experimenting at Maribyrnong in the 1920s-30s.[208] There were also experiments for W.R. Hume on a mixture of cement and asbestos for lining pipes, as well as asbestos and pitch. Turnbull was described by a colleague as 'a very diligent and painstaking worker' but who was 'often at loggerheads with the Managing Director [W.R. Hume] who had little patience with him'.[209] The 'bumping process' was an important innovation developed at Maribyrnong and made a considerable difference to the density and quality of the concrete. Typed notes, headed 'Maribyrnong', in the ANU Archives, describe the importance of the bumping process:

> *To describe technical difficulties, failures, and cost of those experiments is unnecessary, the important fact remained that very considerable success was attained. The material cost and process were cheapened, and the methods were reduced and much more dependable. The quality of concrete pipes by this process was far superior to anything manufactured previously.*
>
> *A new era started, giving Engineers and Public bodies much greater security, and they could depend upon the durability of large pipe undertakings. It was proved possible to mould concrete with such a low water content that the strength, density and general quality was increased two-fold. The concrete became a dense homogenous stone-like material which, on*

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[207] Hume Pipe Company Album, held by Melbourne's Living Museum of the West, Inc.

[208] ANU Archives, Humes Ltd., recollections of J. Turnbull.

[209] ANU Archives, Humes Ltd., recollections of C.C.Halkyard, 29/30 September 1959. Halkyard also worked on experiments carried out in the laboratory at Maribyrnong

'fracture', behaved as a natural stone , and even the sand particles splitting in the fracture.[210]

The document may well have been written by W.R. Hume , though the initial 'CCH' appear lower down the page. Possibly it was intended for C.C. Halkyard, engineer, who did spend some time at Maribyrnong. A further innovation during these years was the rubber ring joint. The Keswick factory in South Australia was important for its engineering contribution to Hume Pipe development and the factory at Hume Steel, Footscray, later took on this role also.

Slab factory

An important development of the 1920s-30s was the slab factory, which was in operation by 1921.[211] Concrete slabs became a popular product and *Hume Pipe News* printed photos of Beaconsfield Parade and other areas where the slabs were being used.[212] One special contract was for slabs at the Shrine, which were all made and laid by the Hume Pipe Company. The slabs had to be in the colour of sandstone. This was the first time the firm had done this, as Sidney Sewell later recalled: 'There was such a variety of sizes that a lot of the slabs had to be handmade, instead of on the machine'.[213] The slabs were but one example of a range of concrete products that the Hume Pipe Company were manufacturing and promoting in the 1920s. Other products included septic tanks, bridge posts, incinerators, lighting standards, concrete columns and concrete bricks. The importance of the Maribyrnong factory in stimulating this development is suggested, indirectly, by G.D. Snooks:

The only significant product was the concrete slab which was first manufactured by the firm in Victoria in 1923/24 and was largely responsible for the growing relative importance of other concrete products in the '20s. However they were less important in the growth of the '30s.[214]

Other new buildings

New buildings in this period were mainly of galvanised iron and timber, sometimes, partly of concrete. Sheds at this time were often open structures, with roofing and posts but no walls. Garages were a new feature in the 1920s and 30s, replacing the need for stables. By the late 1930s there was a new amenities building - a long shed where the men could have their lunch. In the early days, they were expected to take their refreshment next to their machines. By 1939, there was also a changing room, showers and lockers and septic tanks. An electrical and oxy-acetylene welding area was set up to the north of Building 2.

Stores

During the 1930s three of the old bluestone buildings in the study area were used as stores. (Buildings 1 and 3 and the old slaughterhouse)

Office

The difficulties of the 1930s are reflected in the recollections of Gerald Kelly, 'Works Clerk' in 1930, who found he had a wide range of duties.

Not only had I to see to the clerical side, deliveries, materials etc., but also was confidant to the men ... We had to make everything spin out as far as possible in the Factory, and if anything had to be renewed or replaced it was imperative that a very good and sound reason be given, in fact, even then, it was not always forthcoming.

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[210] ANU Archives, Humes Ltd.,, Deposit 32, typed single sheet headed 'Maribyrnong'.

[211] ANU Archives, Humes Ltd., recollections of Dan Herily.

[212] *Hume Pipe News*, September 1925 and December 1938 (Beaconsfield Parade); May 1925 (St.Kilda Foreshore); September 1925 (Flemington Racecourse); December 1925 (Bourke Street). See also articles in July 1926, 'Problem of the Footpath', and in August 1929, 'The "Hume Industries" ', with a section on concrete slabs, which includes the report: ' The slab has been severely tested on a private roadway adjacent to the company's works, and there are good prospects of a large business building up in this direction.'

[213] ANU Archives, Humes Ltd., recollections of S. Sewell.

[214] G.D.Snooks, p. 142.

firm over a number of years and later acknowledged the value of their time in the 'school of hard knocks' at Maribyrnong. The foundations of the 'Bottom Factory' now incorporated in the 'History of the Land Trail', are a visible reminder of extensive development on a Hume factory site during the company's most innovative and enterprising phase.

Hume Pipe Company to Humes Limited 1940-80

During the years from the 1940s to the 1970s the study area showed some of the paradoxes of the earlier years - innovation combined with improvisation, expansion combined with economic stringency. Photographs and plans of the later years indicate that new buildings have been added despite the difficulties of wartime austerity and post-war shortages. Oral reports on the numbers employed at the factory suggest that the workforce was larger than it had ever been since the pipe factory began operations. Certainly the demand for Hume pipes continued and grew and major schemes such as the Snowy Mountains Scheme depended heavily on Humes for supply of pipes. The Maribyrnong factory itself needed to expand or to re-develop and consolidate, but planning authorities had other agendas. Eventually the firm decided the only way to upgrade operations was to move to Laverton.

Physical changes in the study area from the 1940s onwards included topographical changes, as areas were levelled to assist vehicle access and provide larger stockyard areas for the purpose of storing pipes. A substantial portion (over 50%) of the study area was taken up with pipe stockyards, especially for eight foot pipes.[220] Retaining walls were built in this period, notably at the southern boundary of the site. There was demolition of old buildings such as the old slaughterhouse, the slab factory and the conduit plant and the erection of new buildings such as Building 7 or the 'Top Factory', new storage sheds, a two storey amenities block; and finally a new boiler house. There was upgrading of Building 3 as an extensive and greatly improved Fitters' and Turners' Shop and the re-distribution of plant, following the increase in buildings.

The company sold the quarry land on the hill, after filling the quarry and sub-dividing the area. The need for a new supply of bluestone led to the lease, later purchase, of a large ten acre quarry in Altona (now the Altona Gate Shopping Centre in Millers Road). The five acres of land on the southern boundary, leased from the Commonwealth, were purchased in 1961.

1940-50 End of an era

In 1942 the Hume Pipe Company celebrated 50 years of Hume enterprises, taking the starting point of the firm as the year 1892, when Walter R. Hume and his brother and Ernest J. Hume joined forces and set off for the country near Mornington, where they undertook repair and construction work.[221] To mark the occasion, Hume Industries purchased 1,000 acres near Laverton 'for the betterment of Hume Industries and for the benefit of all men connected therewith'.[222] There were plans for company housing and amenities as part of the total scheme. A commemorative album was presented to W.R. Hume by employees of Hume Industries as 'an expression of their sincere respect and good will with congratulations on completion of 50 years of outstanding progress of the Hume industries.' The employees' names in this album include many who worked or had worked at Maribyrnong, with their years of service. A considerable number had been with the firm for over ten years, including Harry Pearce (23.5), T. Sweetman (23), L. Markey (23), D. Herily (22), J. W. Nolan (22), W. Newman (21), C. Kimpton (21), T. R. Rennard (20), J. F. Hills (19), S. B. Jeffrey (19), F. R. Wilson (17), F. Waight (15), R. Coppin (13), A.J. Brain (10).[223] This testimonial list gives some indication of the place held by Maribyrnong in the overall experience and training of Hume employees, but also a sense of the

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220 Humes site plan, dated 4 June 1971.

221 G.D.Snooks, 'Innovation and the Growth of the Firm: Hume Enterprises 1910-40', in *Australian Economic History Review*, No.13, 1973, p. 18. See also S.Encel and M.Dea, 'Walter Reginald Hume (1874-1947) [sic], 'Some Notes on a Pioneer of Pipe Technology', *Records of the Australian Academy of Science*, vol. 1, no. 4, p.18. This article has some inaccuracies, noted by G.D.Snooks and by staff of the Humes firm.

222 *Hume Pipe News*, July 1943.

223 ANU Archives, Humes Ltd.

ties of loyalty and even pride that kept men working for the same firm over a period of time, despite hard and difficult working conditions.

The company's composition and structure changed considerably during the years following the early 1940s. W.R. Hume, the managing director, died in 1943 and *Hume Pipe News* wrote:

> *Mr Hume's death brings to a close one of the most colourful careers in industrial life. As an inventor, he stands supreme in the annals of Australian history, his achievements in this field alone assuring him enduring memory and fame.*
> *... with a spirit that never admitted defeat, and with tireless energy and persistence, Mr Hume gradually convinced the engineering world that the Hume pipe was not only a revolutionary achievement, but gave the world a new means of constructing water supply systems.*[224]

The firm took on a new name, 'Humes Limited' in 1950. Later, the sons of W.R. Hume, who had all been involved in the business, left the firm to run a separate company.

Humes Limited 1950-1979

In 1951 the new firm and Hume Steel Limited between them operated 52 factories throughout Australia and New Zealand. One of the Humes staff wrote at that time:

> *Hume Pipes have played, and will continue to play, a very big part in the development of Australia and New Zealand, as there is hardly a town throughout the land where these pipes are not giving excellent service: water supply, sewerage, drainage, culverts, gas supply, conduits, pipes for every purpose.* [225]

Productivity at Maribyrnong increased to the point where the plant 'could produce up to 100 tons of concrete pipes per shift',[226] utilising eight moulding machines. Throughout the 1940s and 1950s the Maribyrnong factory was serving the greater part of the Melbourne area with spun pipes. When Humes' Westall plant began supplying the eastern and southern sections of the City in 1958, this eased the burden on the Maribyrnong factory.[227] Numbers at the factory during these years appear to have been in the vicinity of 150.

Workforce and working conditions

The character of the workforce changed with post-war migration. Many of the men who found jobs with Humes in the 1950s and '60s had only recently came off the migrant ships. At one stage, a third of those employed in the study area were Italians. The work was still hard and long, but by the 1970s there were safety measures in operation, such as protective ear-muffs, gloves and warning notices in English and Italian, for example 'Attenti alle ditta' - Mind your fingers'. There was still a considerable amount of handling of heavy items - bags of cement and the smaller pipes, but also manual shovelling of concrete into the moulding machines. Reg. Hume has recalled that a number of accidents occurred at Maribyrnong.[228] When Eric Treloar joined the Humes firm in 1964 and went out to the study area, he 'nearly died ... Charles Dickens would have turned in his grave'.[229] Innovations such as the use of fork lifts, for moving heavy items, helped to reduce the dangers of manual handling, as did the Holden engine used on one of the rail lines south of the Bottom Factory.

Italian-born Johnny Caruso, who worked in the study area from 1960 to 1979, remembers that there were about 160 men working at the factory when he started. Working conditions were

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224 *Hume Pipe News*, July 1943.

225 Harry Preskett, 'Mighty Oaks from Little Acorns Grow: a brief summary of the development of Humes', Melbourne, 1951, ANU Archives, Humes Ltd..

226 *Hume News*, July 1979, 'Phasing out the old in Victoria: Laverton replacing Maribyrnong', p.3.

227 Humes Limited, *The Humes Story*, company publication, Melbourne, 1985, p.7. By 1985, the company had a total of 63 factories throughout Australia, including steel and plastics, and 27 overseas manufacturing centres.

228 Reg, Hume, tape recorded interview with Olwen Ford, 10 August 1995.

229 Eric Treloar, personal communication to Olwen Ford.

'alright'. A working day was ten hours with four to six hours on Saturday (overtime). He used to start at six o'clock in the morning.

> *In five minutes, I'm sweating. You used to work faster. Production for ten hours. We finish in six or seven hours, after, we go fishing in the river. As soon as we finish we relax. [It was] the best time I had here, because we enjoy ourselves. It was like a big family. We know each other, everybody. We try to help each other, finish altogether and have a few drinks when we finish work. And Fridays we make a barbecue and have a good time ... I was quite happy on the job. I know the job. I know what to do. Even the manager comes asking a question if he wants to know anything.*[230]

A number of Johnny Caruso's workmates have shown the same affection for the workplace, if not the work. No study has been done of the health hazards of working at the Humes factory, but some of the older workers, in their retirement, have suffered from asthma, bronchitis, cancer and injured arms and backs.

Stone crusher

By the 1940s, stone was being brought in by truck from outside quarries. The large and powerful crusher near the southern end of Building 7 had a revolving screen. From this the bluestone metal would run down and fall through graded holes into bins for each size - quarter inch, three eighths of an inch, half inch and finer stuff called metal dust. Chutes went from the bins to where trucks could go and get the metal required and take it round to the mixers. By 1961, the firm began buying stone ready-crushed and there was no further need for stone crushers on site.[231] Increasingly, areas had to be provided for the storage of 'aggregate', near each production area.

Top Factory

A sign of the expansion of the Maribyrnong factory was the construction of the 'Top factory', a substantial structure built in the early 1940s. It is not on the 1939 plan. Harry Pearce, who returned to the Maribyrnong in 1938, has recalled that a lot of timber, and possibly iron, from the old Humes/Warrs home in Maribyrnong were used in the construction. This included especially the lighter wood, such as rafters. The main part of the shed was for production of six foot pipes. Basically the construction of such pipes was transferred from Building 2 to the Top Factory. The southern end was for the production of four foot 'specials'. The entire range of processes was carried out in the one building - moulding, reinforcement making, steam curing, stripping and assembling the moulds. The reinforcement machine that used to be in Building 2 was brought up here and installed at the northern end of the building. One of the moulding machines , which had originally been in Building 2 was also brought up to the Top Factory. By the 1960s there were four machines in the Top Factory. Each machine had its own number and its own team of men.[232]

The process went west-east, starting in the earlier years with the concrete mixers on a wooden platform supplying concrete down two chutes, one each side of the moulding machine. There were two concrete mixers to each machine. One man working on one side of the machine would shovel concrete into the machine at one end of the pipe mould and the other man would shovel concrete in at the other end. At the conclusion of the spinning process, the moulds were rolled onto a ramp at the end of the machine and into the steam chamber. Stripping and assembling was carried out just outside the steam chambers and the moulds returned to the machines, via the open spaces between the steam chambers. Racks in front of Building 7 were the stockyard for the four foot pipes and the six foot pipes. These pipes were also stored at the southern end of the site, above the retaining wall. By about 1966, a concrete batching plant in the Top Factory was operating and this can be seen on film footage of 1980.[233] It replaced all the manual work of shovelling or tipping screenings, sand and cement into mixers.

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230 Johnny Caruso, recorded interview at Pipemakers Park, , 24 August 1993.

231 Garth Knobloch, recorded interview with Gary Vines on site, 13 August 1987.

232 Joe Bonnici, recorded interview with Gary Vines, on site, 13 August 1987.

233 'The way we were', mute historic footage taken at the Humes Maribyrnong plant, March 1980. 16 mm. film.

Bottom Factory

The main change in these later years was the erection of sheds, or roofing, for the stripping and assembly areas east of the steam chambers. Four moulding machines and four steam chambers were in this area during this period. Wire drawing was transferred to Building 2. This building was basically an accretion of sheds, with blue canvas-like hangings as a substitute for walls.

Wire Drawing

During these years Maribyrnong became a recognised centre for the production of drawn wire for use in concrete pipes and was supplying other Hume factories. Building 2 ceased to be a moulding factory and became known as the wire- drawing area. The big coils of wire, from Rylands of Newcastle, reached the upper level via a concrete chute at the northern end of the building. The wire was immersed in a very strong bath of sulphuric acid, in pits dug in the upper level of Building 2. This was to clean the wire of scale. A travelling hoist from an overhead rail picked up the coils of wire and lifted them from one bath to the next. The sulphuric acid was then hosed off, to make it clean. The wire drawing machine could reduce the wire from five gauge to eight or ten gauge, or whatever size was required.[234] Two sheds (or one large shed in two sections). between Building 2 and the river bank, were storage sheds for the drawn wire.

Fitters' and Turners Workshop

The continuing importance of the Maribyrnong factory was evident in the increased use of the Fitters' and Turners' Shop, now located in a re-furbished Building 3, with more extensive equipment.[235] By the 1970s, there were 14 men working in the Fitters and Turners workshop[236] and Maribyrnong became an important centre for the supply of spare parts to Hume factories all over Australia.

Amenities

A two story amenities block went up in the 1950s -60s. However, by the 1970s, the top floor of this building was used mainly for administrative purposes, with a number of offices located there.

Floods

The worst flood during the later years was in 1974, when a major flood covered the Maribyrnong flood plain. Photographs taken at the time show that the water did cover sections of the study area, although the building up of the river banks with concrete waste, over the years, possibly reduced the extent of flooding in the study area.

Planners versus pipes

An early vision for Melbourne, including the Maribyrnong Valley, was the concept of a system of linear parks along the waterways. This was first developed in 1927. With the expansion of the metropolis and its suburbs, planners within local authorities and the Melbourne & Metropolitan Board of Works began considering the possibilities for new metropolitan parks and public open space along the waterways.[237] This would involve encouraging or forcing the removal of industries from the banks of the waterways. Planners within the City of Sunshine supported this policy and refused applications from Humes Limited for development proposals within the study area. As a result, Humes decided to re-locate to Laverton. Melbourne Metropolitan Board of Works purchased the site from Humes Limited. By this time, the study area was designated as 'Proposed Public Open Space' on the Metropolitan Planning Scheme.

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234 Harry Pearce, interview with Olwen Ford, 28 September 1982.

235 Harry Pearce, interview with Olwen Ford, 28 September 1982.

236 Bill Tepper, conversation with Olwen Ford, 1987. Bill Tepper was a fitter at the factory for many years.

237 See Tony Dingle and Carolyn Rasmussen, *Vital Connections: Melbourne and its Board of Works, 1891-1991*, pp. 235-240, 312-313, 319-328.

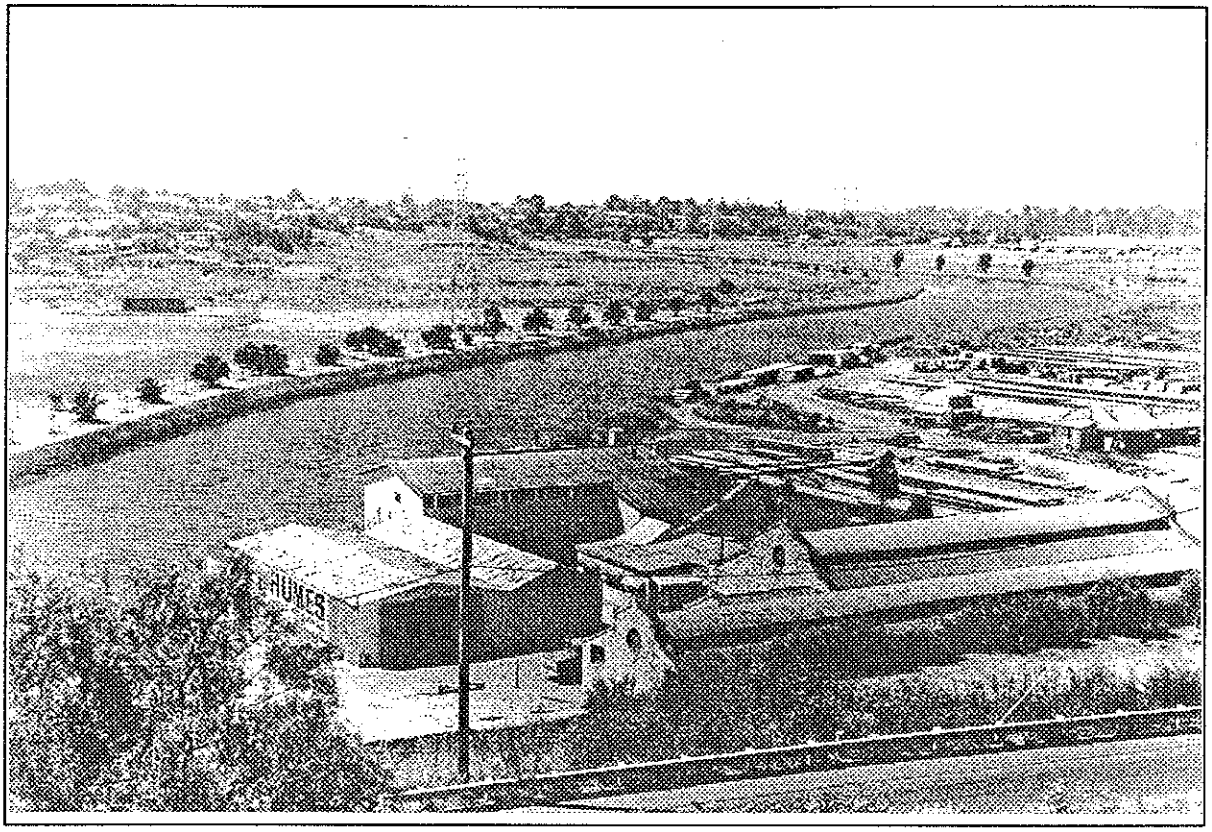

Plate 19. View of the Maribyrnong Works, c.1970.[238]

Winding down 1970s

By 1979 Humes Limited had 44 concrete manufacturing centres throughout Australia. By this time also the Maribyrnong factory seemed 'very much a relic of the past with machines and methods reflecting the earlier days of the company and a far cry from the factories of today, as represented by its successor, Laverton.' [239] In its last few months the Maribyrnong factory had only eight or nine men working there. The first stage of the new Laverton plant was completed in 1979 and a number of workers from Maribyrnong transferred there.

Summary

In 1951, the Humes firm was described as 'the largest manufacturer of steel-reinforced concrete pipes in Australia'. [240] It undoubtedly made an outstanding contribution to Australia's industrial and economic development. According to G.D. Snooks, Maribyrnong was 'still the main company factory in the 1970s'. [241] As the oldest surviving Humes factory in Australia, the study area provides visible evidence of the growth and expansion of Hume concrete pipe production post 1940. It also gives evidence of improved systems of materials handling - overhead travelling crane or gantry and a concrete batching plant. The Top Factory, or Building 7, can be seen as representing the expansion and improvement of this period, as well as the realities of 'make do' in a rather primitive workplace which grew like Topsy.

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238 Hume Pipe Company Album, held by Melbourne's Living Museum of the West, Inc.

239 *Hume News*, July 1979, 'Phasing out the old in Victoria: Laverton replacing Maribyrnong', p.3.

240 C.G.Carlton, ed., *Sunshine Cavalcade*, Melbourne, 1951, p.77. At that time, Maribyrnong was within the City of Sunshine.

241 G.D.Snooks, p. 129.

At the same time, the environmental impact of Humes' concrete pipe factory on the study area was very considerable, including not only changes in the topography, but degradation of the banks and soil, possibly the river itself, through dumping of concrete debris and slurry.

Further research could yield additional information on the productivity of the Maribyrnong factory and this could be assessed in a comparative study of other Humes factories across Australia. Further oral history research would provide further insights into the role of the factory in wider contexts, the experiences of those who worked there and changes in technology. However, the remaining physical fabric, combined with the available oral evidence, suggests that this is a workplace of particular significance which enhances our understanding of Australia's post -war development.

Humes expansion and takeover

During this last phase of the Maribyrnong factory, the Humes company had greatly diversified its range of products. These included pre-stressed concrete sleepers and bridge beams, box culverts, building material, garden and landscaping accessories, manholes, kerbing and guttering. None of these appear to have been made at Maribyrnong, though the factory made concrete blocks to use up surplus concrete at the end of a day. The Humes firm moved into plastics in 1961 and the manufacture of PVC pipes and products became an important part of Humes activities.

Notable developments in the corporate structure, which affected the range of products, were the merger of Humes Steel Limited with Humes Limited in 1952 and the buying-up of ARC Industries Limited in 1982. By 1985 Humes was operating 27 overseas manufacturing centres in New Zealand, Fiji, U.S.A., U.K and Papua New Guinea. However, by the 1990s the Humes company no longer existed in Australia as an entity in its own right. In a series of takeovers, Smorgons bought out Humes Limited and Humes ARC and later sold the concrete division of Humes to CSR.

2.7 A Park for the People

The study area was rezoned from 'General Industrial' to 'Proposed Public Open Space' in 1976, but it was many years before the area was developed as public open space. A number of individuals developed landscape plans for the study area as parkland.[242] Sustained community activity and government intervention were key factors in the development of the study area as a park. This took almost ten years, from 29 December 1978, when Melbourne & Metropolitan Board of Works became the owners of the study area, to 6 November 1988, when the Premier of Victoria, the Hon. John Cain, officially opened the new park, naming it 'Pipemakers Park' and emphasising the importance of its industrial heritage. Bicentennial funding was a major factor in the study area's development as a park.

Melbourne's Living Museum of the West were invited to take up occupancy of one of the surviving bluestone buildings. (Building 3) The Museum's lease was accompanied by a licence to interpret the park. Since that time, the Museum has run the park's Visitor Centre and has attracted funding for a range of projects and programs in the park.

[242] These included Don Marsh (1974), Rudolph Arends and Brian Stafford (1981).

2.8 Plans of Historic Development

A small number of plans of the study area are available at a scale sufficient to show changes in the landscape and range of buildings over time. These are the 1857-8 subdivision plan, the 1908 sale plan, the 1933 MMBW Sewerage Plan, and the 1939 and early 1970s Humes Factory Plans.

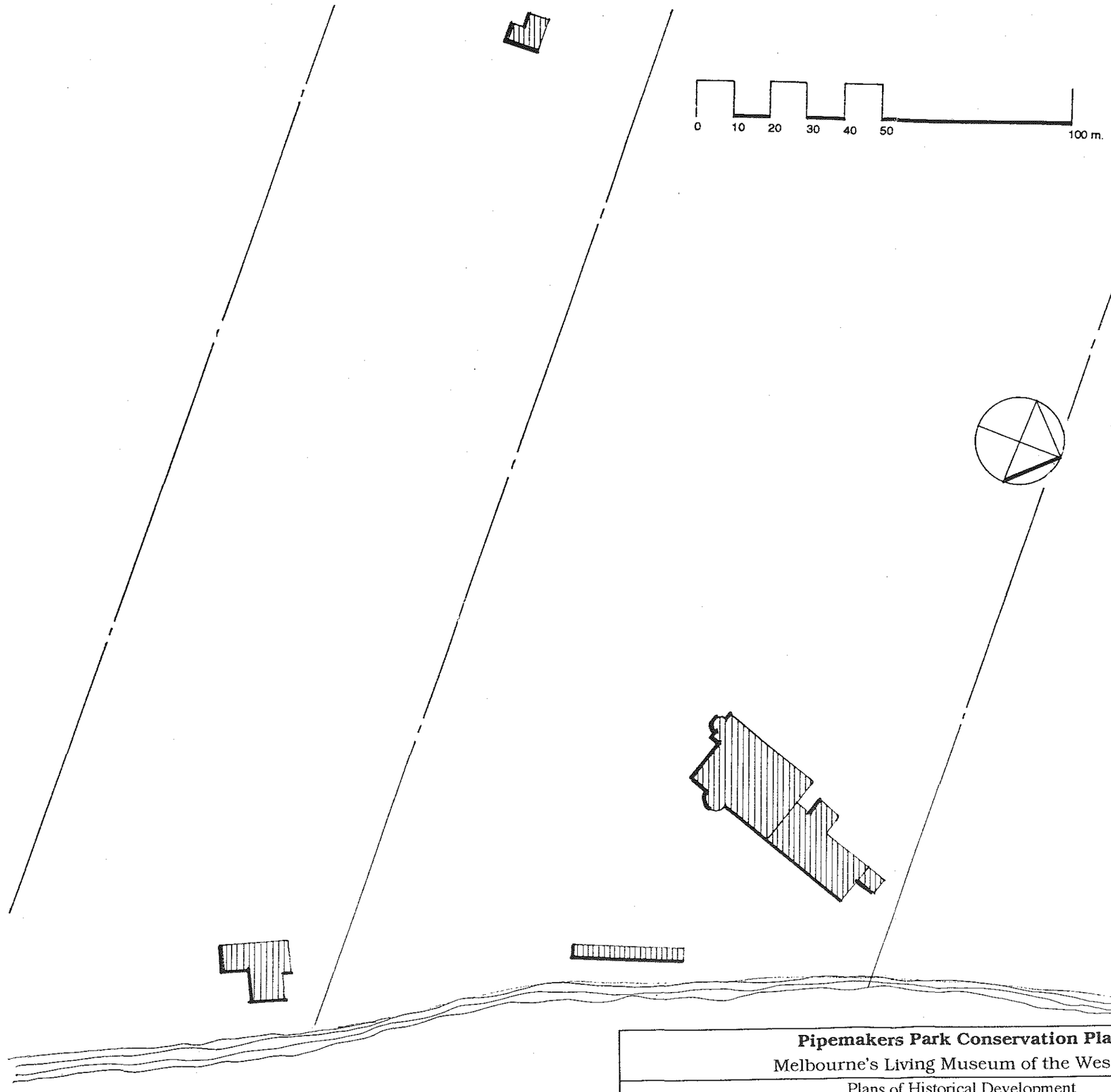
These plans have been reproduced in this section to a common scale of 1:1000. They have been enlarged or reduced using photocopiers to permit comparison, and in some cases have been redrawn using later base plans to interpret indistinct features from the originals.Conjectural plans are also included for the perieods c1872 and c1886. These are based on photographic and historical data which reveal aspects of the layout of the site at that time. The periods reflect the state of the works diring production peaks, just before the fire of 1873 in the first case, and at the time of the closure of the meat works in the latter. The tracerd drawings and conjectural plans were prepared by Zwonko Orsanic of KaZoo.

Conjectural and traced plans:

1857-8	redrawn from Plan of Subdivision of Maribyrnong Estate, Vale Collection, State Library of Victoria.
c1872	based on contemporary illustrations and later plans
c1886	based on contemporary illustrations and later plans
1908	redrawn from Subdivision Plan.... 1908, Vale Collection, State Library of Victoria.
1933	redrawn from MMBW sewerage plan (160 ft to an inch)

Followed by site plans from Hume Pipe Co.

1939	Hume Pipe Co. (Australia) Ltd. Plan of Maribyrnong Works, Vic. 11/9/1939
1971	Humes Limited, Maribyrnong Factory, Existing Factory Site Development, plan of works, 4.6.1971.
1974	Maribyrnong Factory, Proposed Factory Development, Humes Ltd. Melbourne, 1974



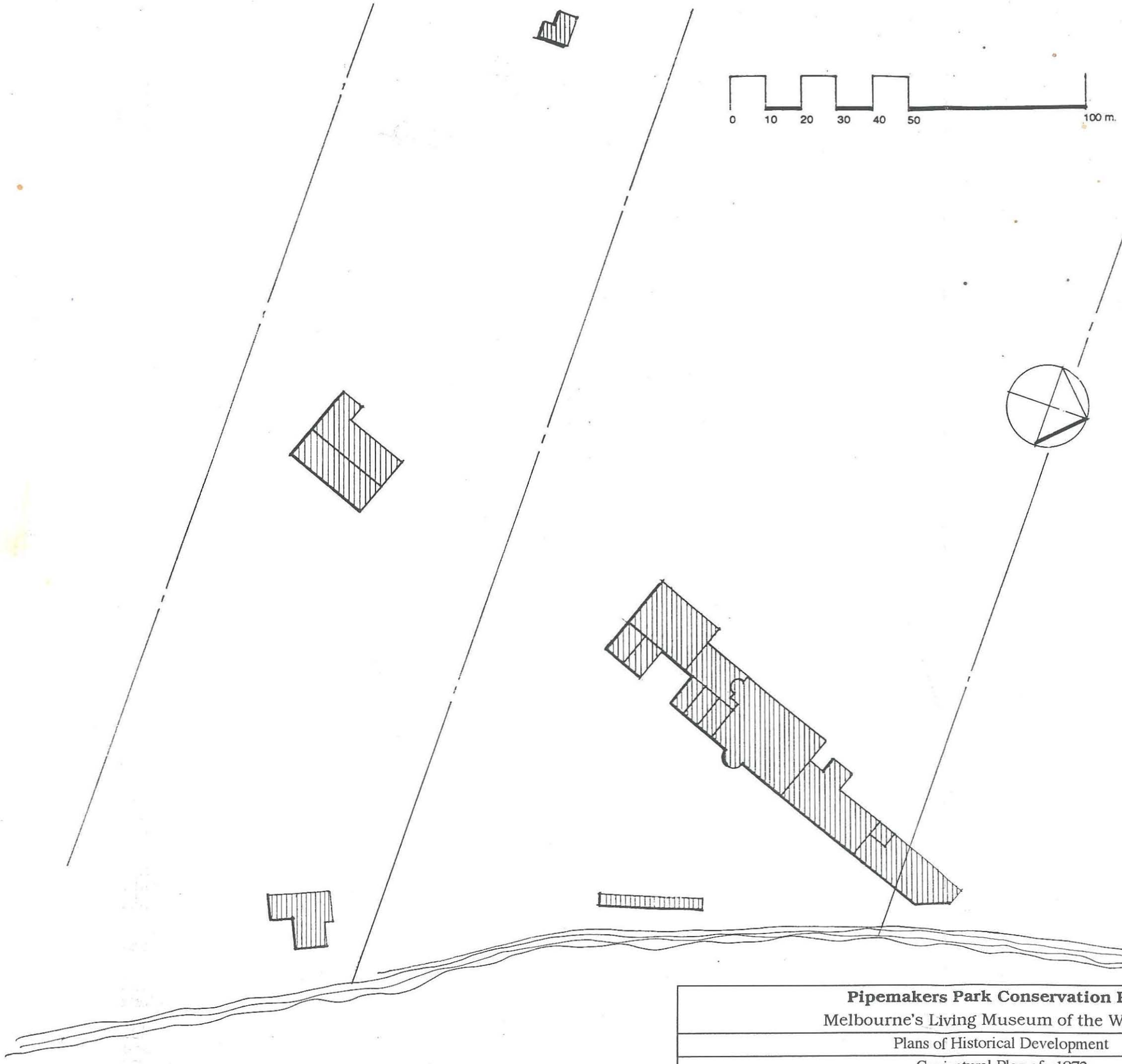
Pipemakers Park Conservation Plan

Melbourne's Living Museum of the West Inc

Plans of Historical Development

Redrawn plan of c1857

Drawn by KaZoo - Kathi Clark & Zwonko Orsanic	31 October 1996



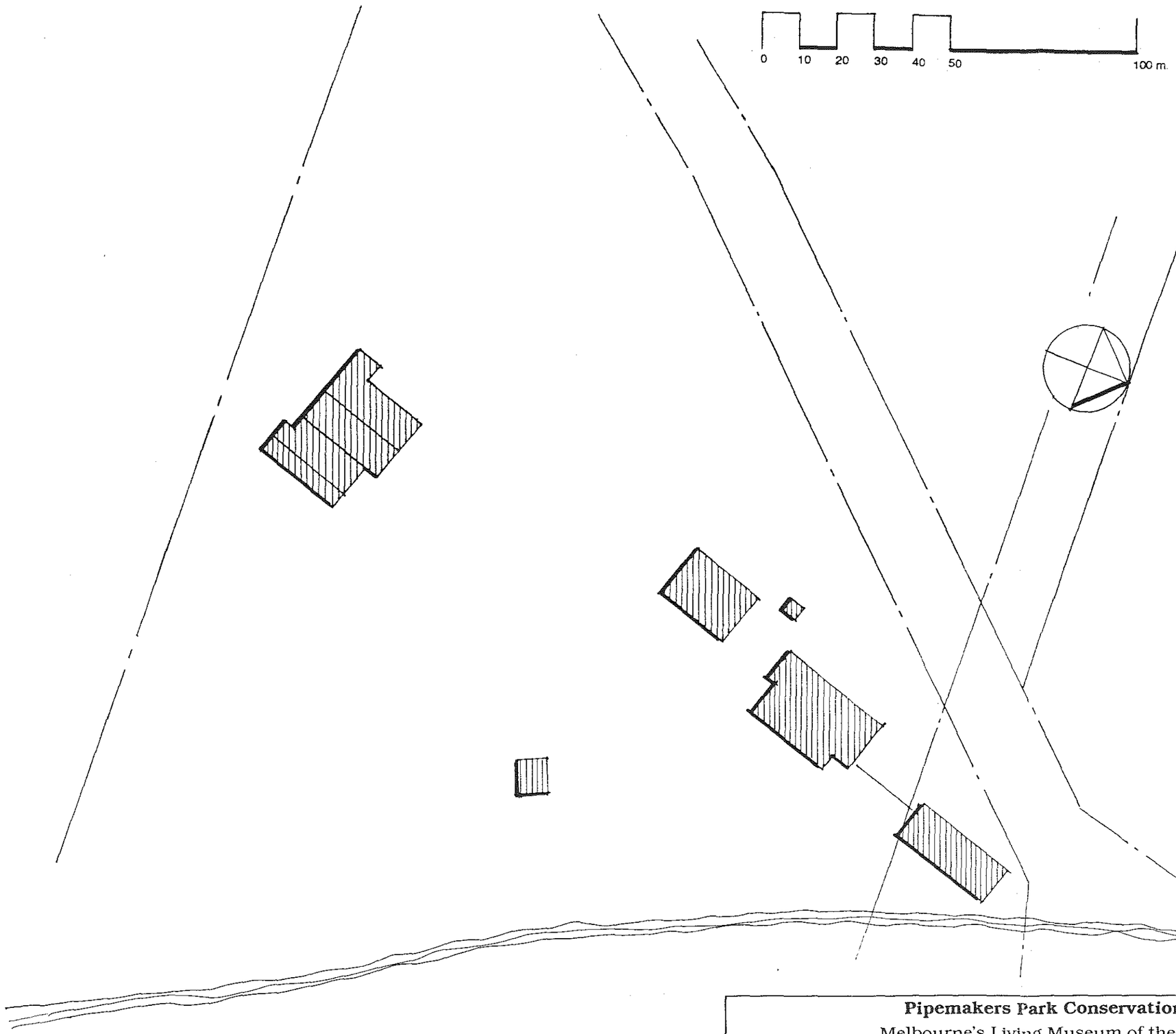
Pipemakers Park Conservation Plan

Melbourne's Living Museum of the West Inc

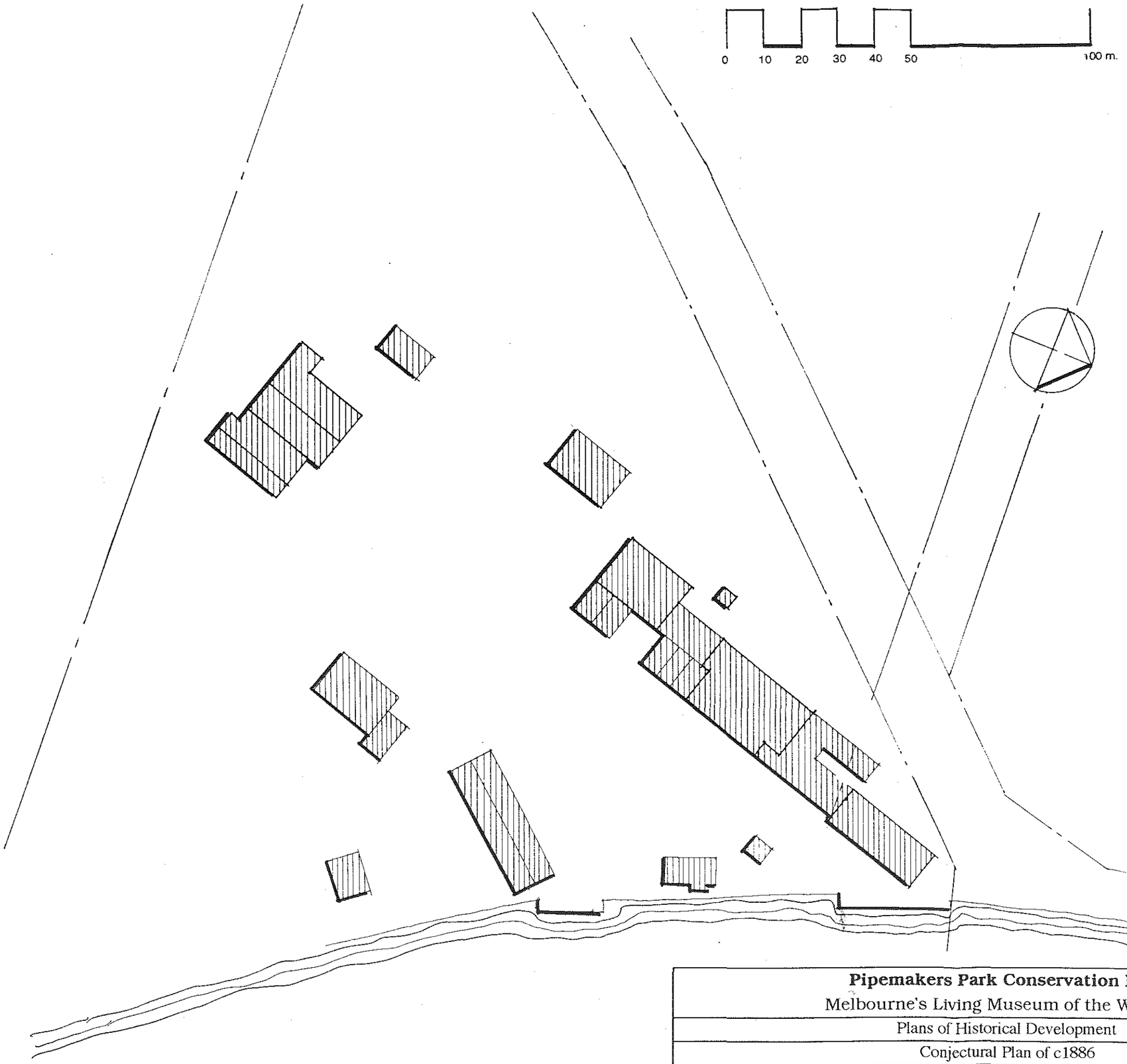
Plans of Historical Development

Conjectural Plan of c1872

Drawn by KaZoo - Kathi Clark & Zwonko Orsanic	31 October 1996



Pipemakers Park Conservation Plan	
Melbourne's Living Museum of the West Inc	
Plans of Historical Development	
Redrawn Plan 1908	
Drawn by KaZoo - Kathi Clark & Zwonko Orsanic	**31 October 1996**



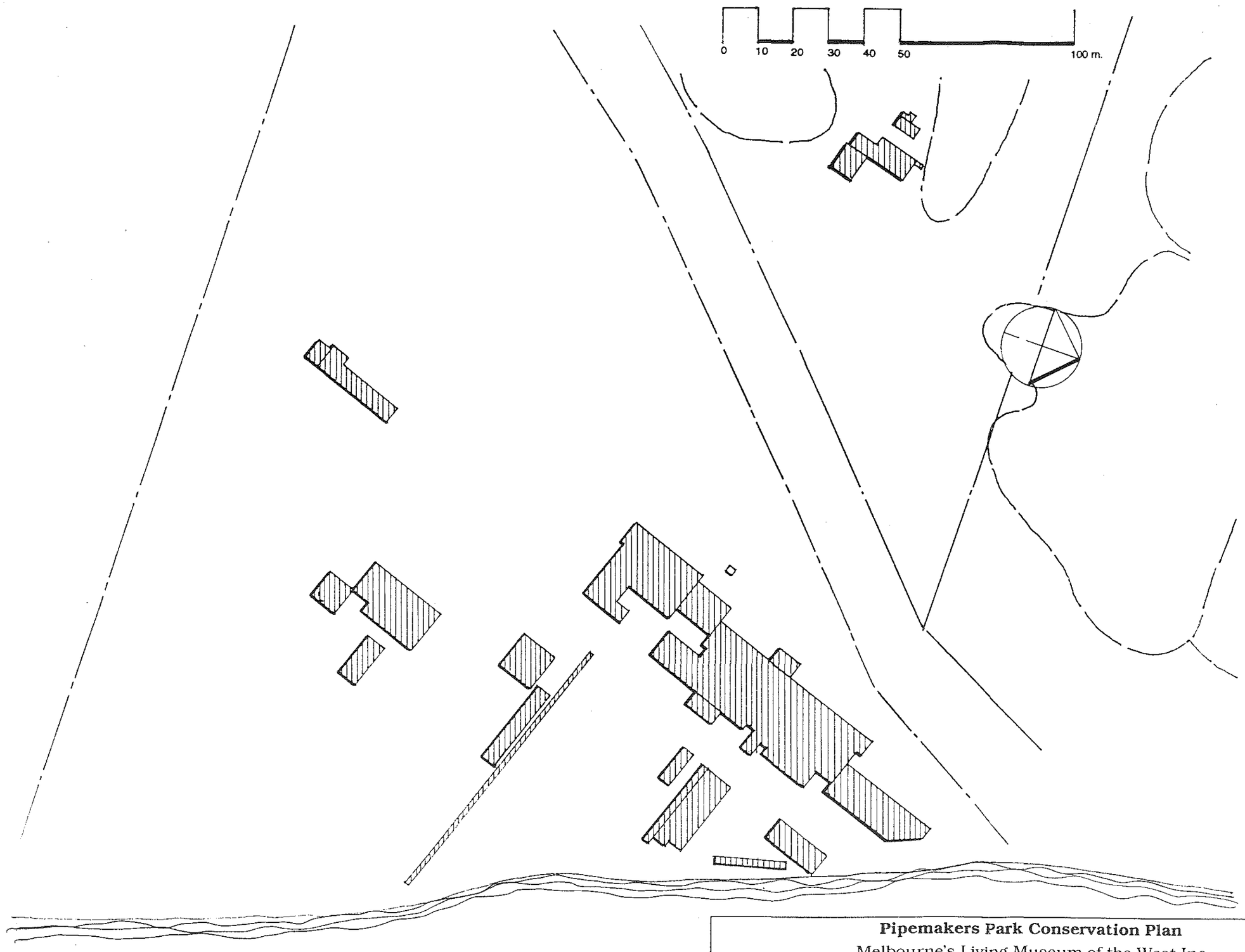
Pipemakers Park Conservation Plan

Melbourne's Living Museum of the West Inc

Plans of Historical Development

Conjectural Plan of c1886

Drawn by KaZoo - Kathi Clark & Zwonko Orsanic	31 October 1996



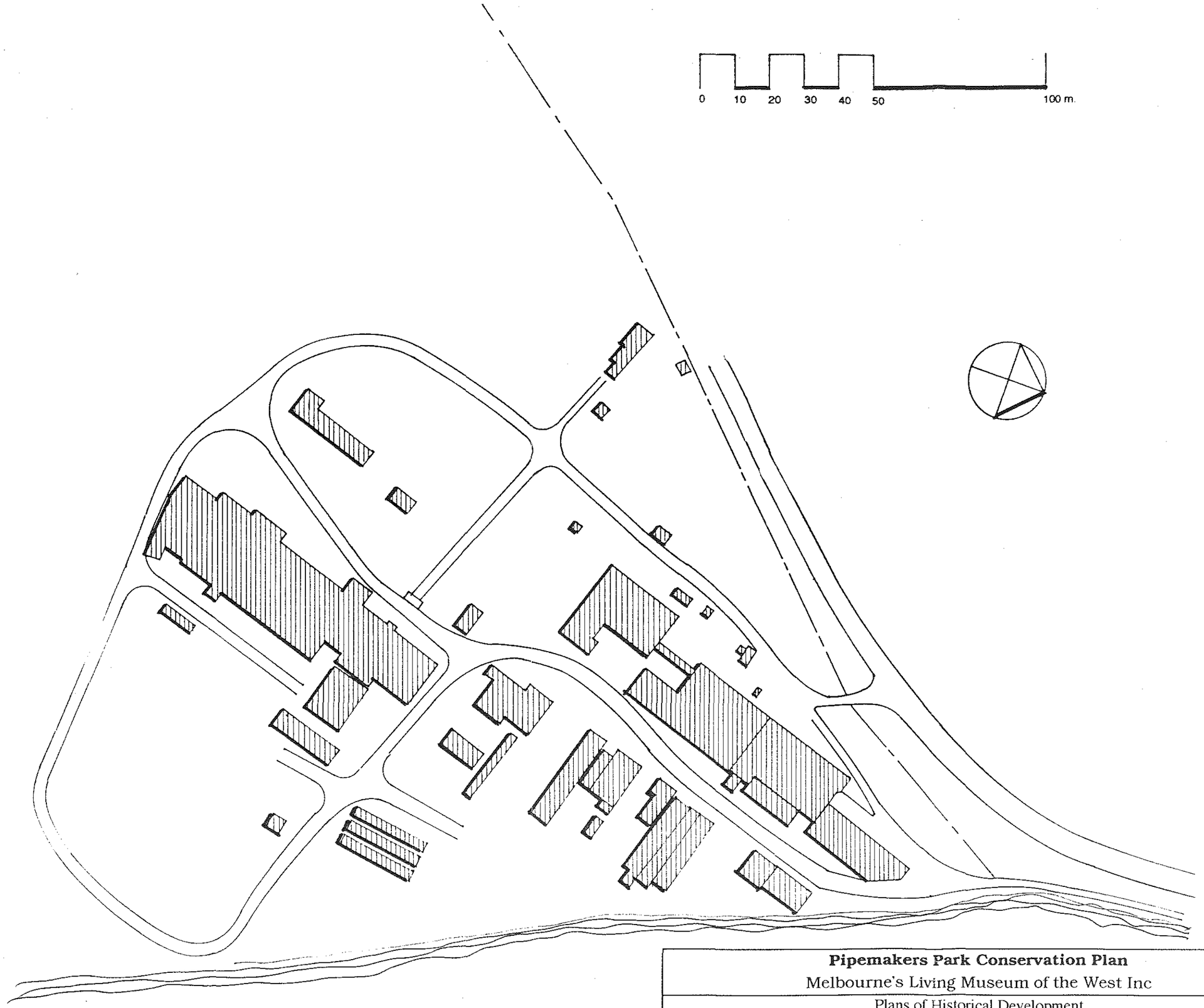
Pipemakers Park Conservation Plan

Melbourne's Living Museum of the West Inc

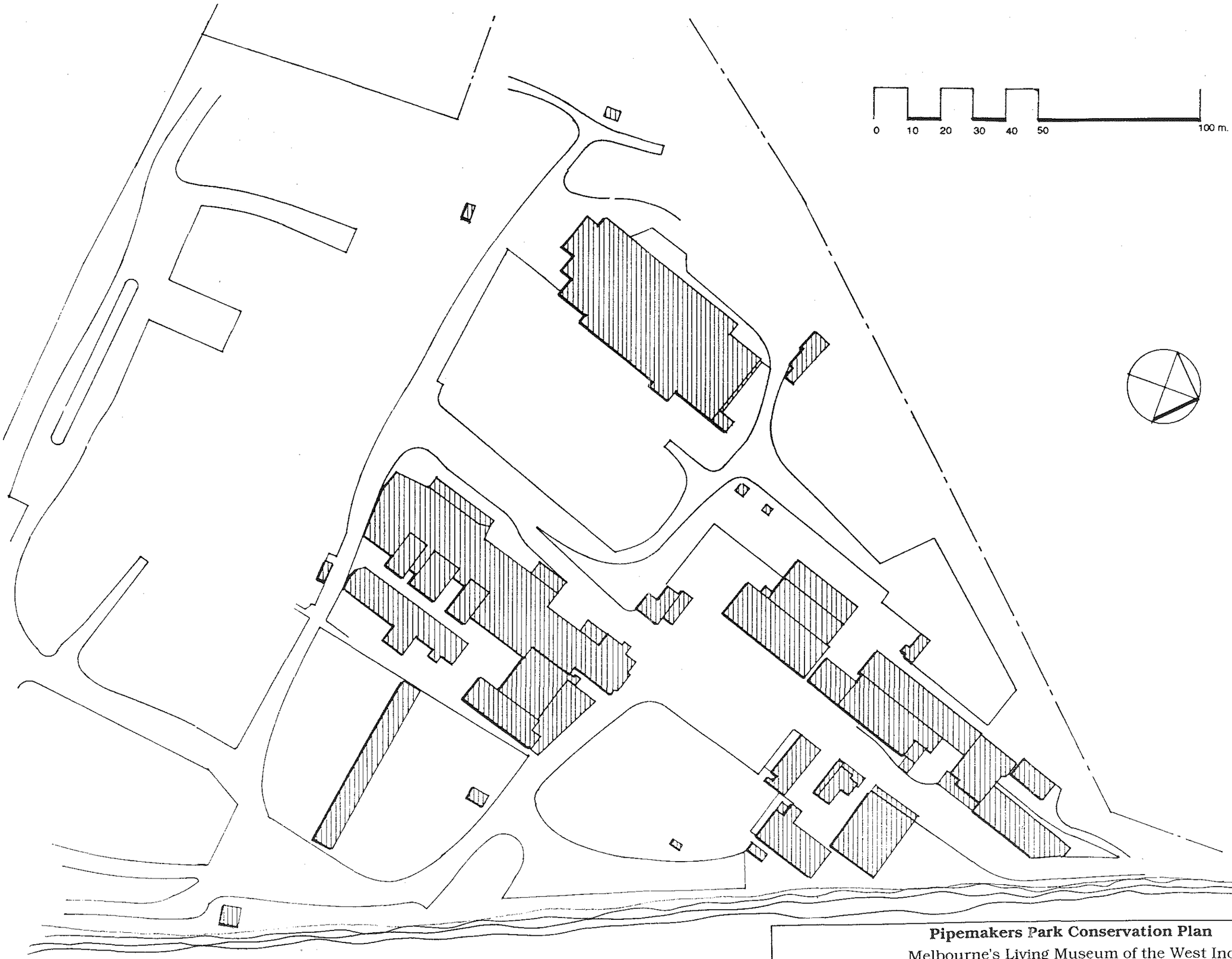
Plans of Historical Development

Redrawn MMBW Sewage Plan of 1933

Drawn by KaZoo - Kathi Clark & Zwonko Orsanic	31 October 1996



Pipemakers Park Conservation Plan	
Melbourne's Living Museum of the West Inc	
Plans of Historical Development	
Redrawn Factory Plan of 1939	
Drawn by KaZoo - Kathi Clark & Zwonko Orsanic	**31 October 1996**



Pipemakers Park Conservation Plan	
Melbourne's Living Museum of the West Inc	
Plans of Historical Development	
Redrawn Factory Plan 1971	
Drawn by KaZoo - Kathi Clark & Zwonko Orsanic	**31 October 1996**

3.0 Site Investigation

3.1 Surviving buildings and features

Building 1, **b. 1872** **d.(part) c 1900**[243]
MMPC tin shop and tallow store,
Humes general store and petrol & oil store

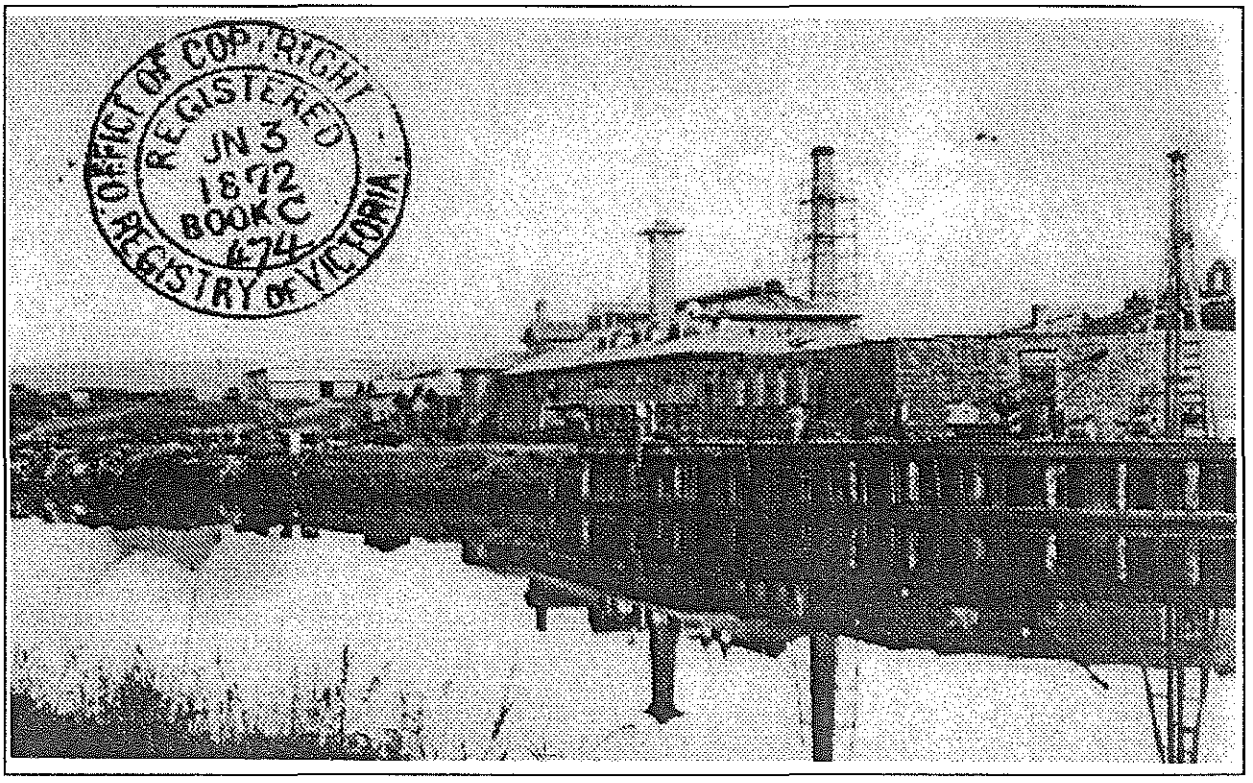


Plate 20. Factory on the Maribyrnong, 1872.[244]

History

Major extension were undertaken at the works in 1872, when a new tinsmiths' shop and machine room were built. A report to the company meeting in April 1872 stated that there was: '...a considerable demand for the company's meats especially for mutton. The directors have determined, with a view to meet the increased demand that has thus arisen, to enlarge the works of the company.[245]

The factory has been enlarged by the erection of a new tinsmith's shop and machinery room. The further extensions contemplated will be proceeded with whenever the prospects of the trade in preserved meat seem to justify this step.[246]

A photograph in the La Trobe Collection shows the building in course of erection, while an etching of 1873 and two photographs, taken about 1875-1880, show the completed building.

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[243] **b.** = 'built' **d.** = 'demolished' **c.** = 'circa'

[244] Factory on the Maribyrnong, originally lodged with Office of Copyright, Registry of Victoria, 3 June 1873, Book C 474, La Trobe collection, State Library of Victoria.

[245] *Argus*, 4 April 1872, p.2 Supplement.

[246] *Argus*, 27 September 1872, p.4.

The building was of stone on the ground floor and timber on the upper floor. It still survives, (known as 'Building 1') though without the upper storey.

The *Australasian Sketcher* of 12 February 1881 described and illustrated the processes of the Australian Frozen Meat Export Company enterprise at Maribyrnong. The Melbourne Meat Preserving Company workers slaughtered and dressed the animals and packed the carcasses ready for freezing, wrapping them in calico. The illustration of the packing room closely resembles that of the 1873 old tinsmiths' shop.

Building 1 was a general store and had timber shelves built along the walls. The northern section of Building 1 was used as a petrol and oil store and had a petrol bowser in the store.

Description

Originally a two storey structure erected in 1872 having bluestone walls on the ground floor and the west, south and part of the north walls of upper storey. The north and east walls of the upper storey were originally timber framed, weatherboard clad with adjustable timber louvres in a continuous band below the eaves.[247]

The original roof incorporated two clerestory or ridge vents, joined at the northern end and containing glazed and louvred panels. The 1857-8 plan, and evidence of tooling on outside stonework and internal cement rendering on the west wall suggest that Building 1 incorporates part of a small bluestone structure dating to before 1858. Speculation regarding the purpose of the render suggests this may have been a additional testing room described in early accounts.

The ground floor contained openings and former openings of five multi-paned windows and three doorways, all having been bricked prior to 1920. A northern and eastern doorway had been reopened by 1920 when they were fitted with fabricated steel doors. The upper timber section had been demolished prior to 1920 and the upper bluestone wall by 1926, by which time the building had been re-roofed with a corrugated iron hipped roof - presumably the existing structure.

The western wall had five segmentally arched windows (now bricked up) and one doorway (converted to a window and now covered in plywood). The stonework on the south side of this doorway is of large proportions and tooled to suggest it was formerly an outside corner of a small building against the end of the butcher shop. Two large doorways (now bricked up) connected this building to the former tinshop and butcher shop to the south.

Internally the building has a floor of square concrete paving slabs, of Humes manufacture, with some parts earth or rough concrete. The building is divided with an internal bluestone wall sectioning off a smaller northern room which has a ceiling composed of six concrete vaults supported on riveted wrought iron beams and four "Doric" pattern cast iron columns. This style of construction was clearly intended as fireproof structure (see comparative analysis below).

A comparison with the 1880 photograph and the indications of the blocked up doorways, suggests that the floor level was raised by about a metre at some stage, possibly to avoid flooding.

A petrol bowser which survives in this section is in derelict condition. It is unknown whether the petrol tank is still in place, but fuel and breather pipes run through the western wall, suggesting there was an above-ground tank outside the building. The floor appears to be earth, with a build up of oil and grease and other detritus. It is highly likely that the floor and soil beneath it is contaminated with hydrocarbon compounds.

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247 *Australasian Sketcher* 19 April 1873; State Library of Victoria Small Picture Collection (Office of Copyright, Registry of Victoria June 3 1872 Book C 474).

Condition

Works by MMBW have stabilised the structure, particularly by removing earth loads from the west wall and repairing brick and stonework. The roofing iron has also been repaired and patched during the last few years, but still has some leaks. Erosion of mortar joints is severe in some places, and require repointing. The existing roof is sound, but has some leaks. The raised floor levels are less susceptible to flooding, but are believed to still be below the 100 year flood level.

Significance

Building 1 is of primary significance as an important and distinctive element of the Melbourne Meat Preserving Co. reflecting a period of prosperity of the firm when this was the largest and most important meat preserving factory at the time. The building displays evidence of the physical expansion of the MMPC during the early 1870s. It is of architectural significance in respect to the adoption of fireproof construction methods, such as the use of cast iron columns, wrought iron beams and concrete jack-arches. This style of construction was typical of mid nineteenth century factory design in Britain, but is rare in Australia. The siting of the building reflects the relationship between the factory operation and river transport with the original wharf being immediately adjacent to the building. As the building incorporates part of a small bluestone building dating to before 1858, it is important as containing some of the earliest fabric on the site. The raised floor of the building shows the adaptation to the flood prone situation by the Humes company when they altered the building for their own purposes.

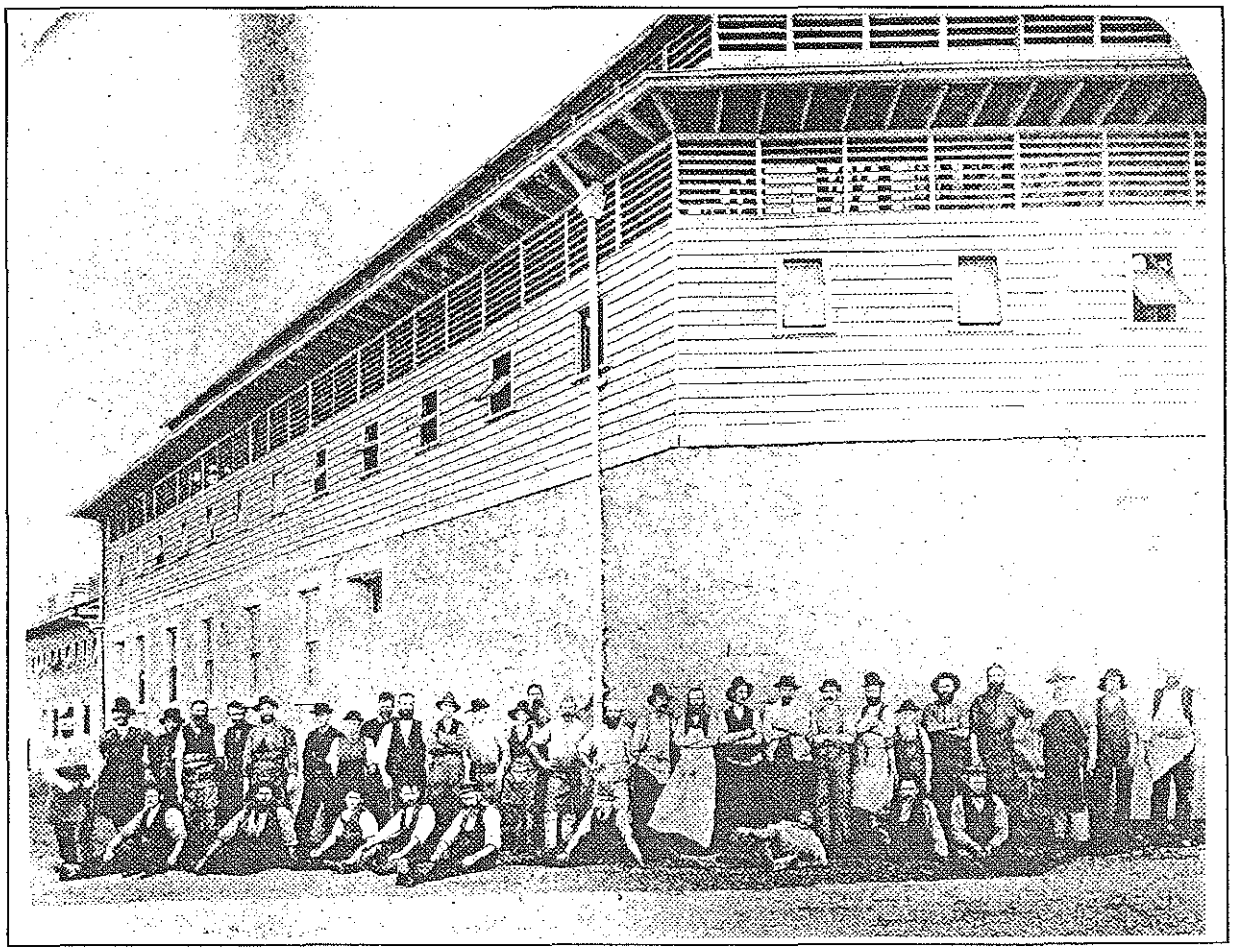

Plate 21.Workers at the Melbourne Meat Preserving Co. outside the tin shop, c.1880.[248]

[248] Photo courtesy of Mrs. Ravenhall.

1A MMPC Tin shop / butcher shop (part demolished) b. pre 1858 d. c1900
Humes sheds and garage (demolished) b. c1945 d. c1984

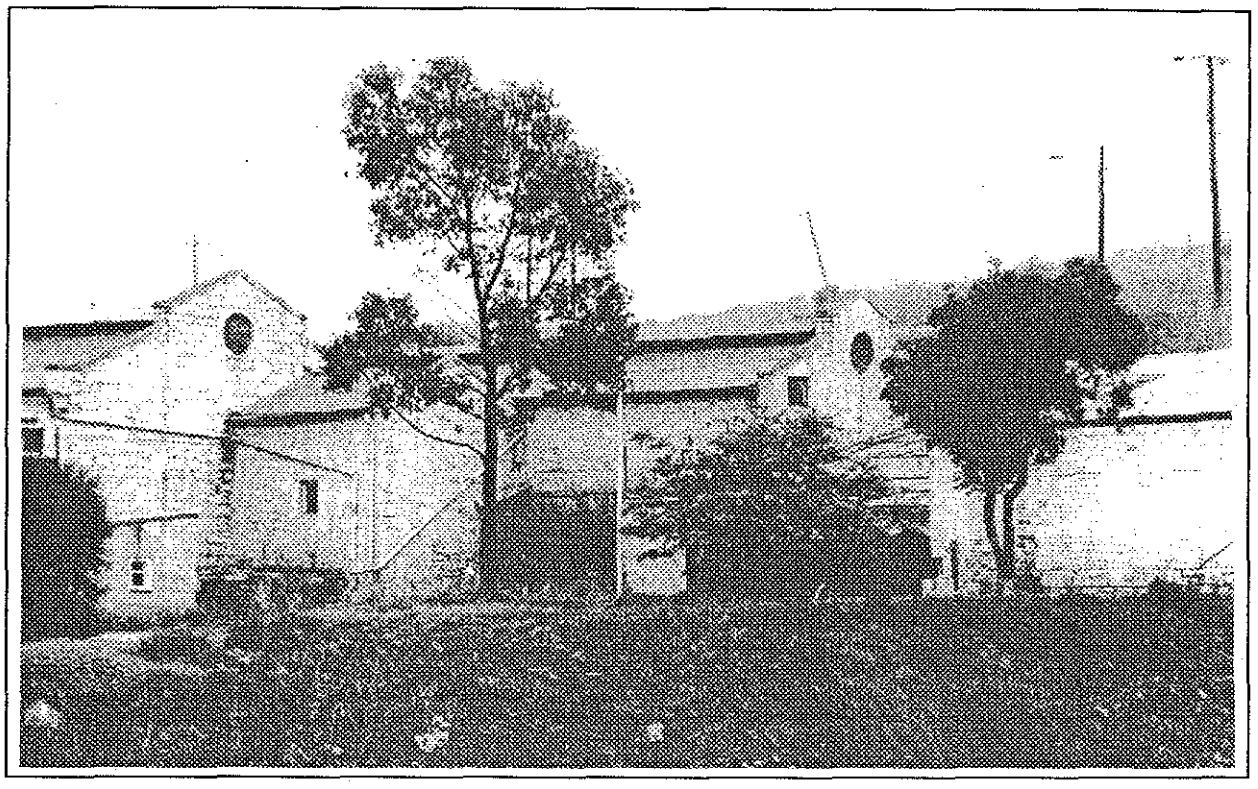

Plate 22. Former tinshop, prior to removal of Humes sheds, c.1978[249]

History

Between Buildings 1 and 2, there was originally a two storey structure, indicated in the 1868 and 1872 illustrations, and shown on the plan of 1857-8 with two small protuberances, one on the west wall, and one on the north wall. This was later incorporated in the structure of Building 1 (see above). The Building was used as a butcher shop downstairs, and tinshop upstairs, and had internal connections to both Buildings 1 and 2 by large brick-lined openings. The opening into Building 2 has a semicircular arch which is still evident, although now blocked up with concrete.

Comparison of a number of early plans (by enlarging or reducing plans to the same scale and using overlays) provides evidence of the dating and location of a building which is on the 1858 plan and appears to be the two-storey bluestone and timber building used as a butchering room or butchers' shop on the ground floor and a tinsmith's shop on the upper floor. Adjoining the main bluestone section of Raleigh's boiling down works, this building was 90 feet long by 30 feet wide and occupied the space (90 feet in length) which now exists between Building 2 and the building now known as Building 1 (currently used as a mosaic studio), and not constructed until 1872.

[249] Photograph by Ruth Ford, 1978.

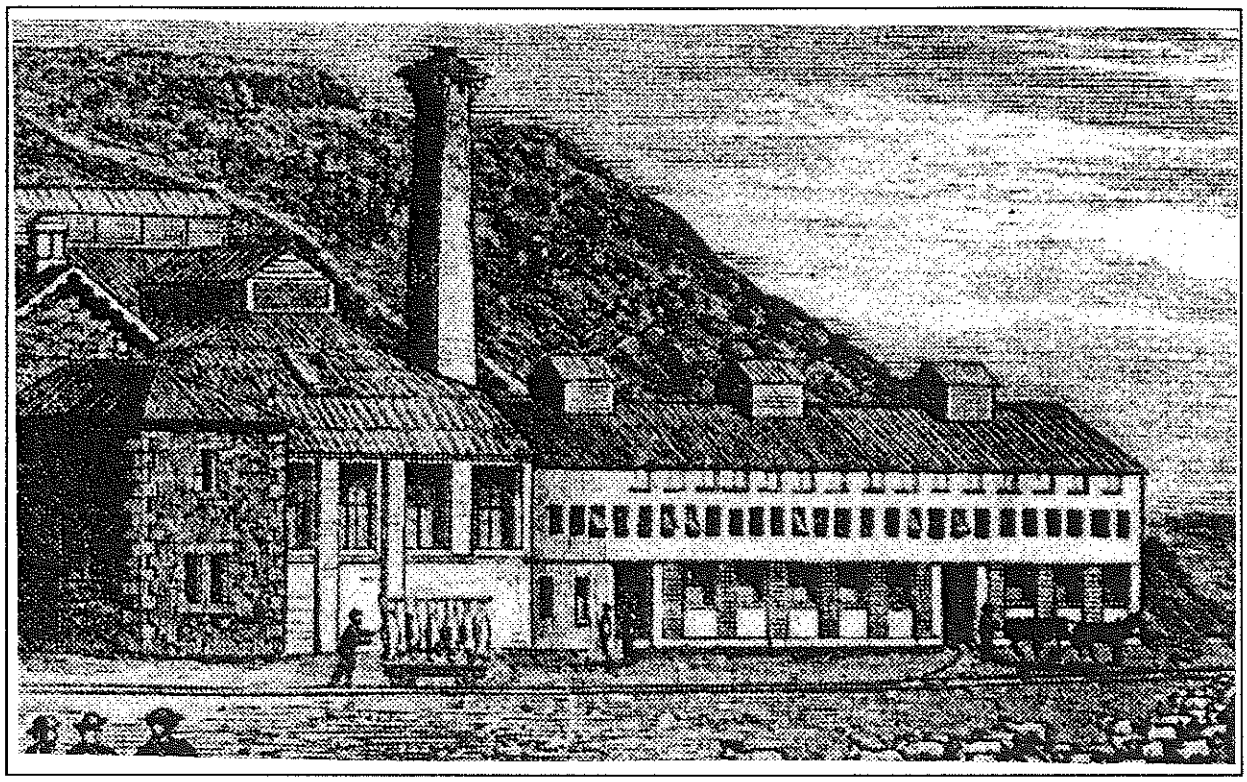

Plate 23. Part of 1868 view of Melbourne Meat Preserving Co. works.[249]

Description

The building appears to have had low ceiling heights with a bluestone ground floor and timber upper storey. It had already been demolished or destroyed by 1908.[250] It is shown in the 1868 illustration, as having eight large windows and two doorways with tramlines entering the building on the ground floor and many small central pivoting windows on the upper wall. The twin-hipped corrugated iron roof had three square ridge ventilators and smaller circular ventilators which appear to correspond to the tinsmith's brazier flues shown in an internal view described as the Tin Shop, MMPC.[251] This view also suggests that the west wall was bluestone.

All that remains of this building is the lower section of the western wall, the end party walls adjoining Buildings 1 and 2 and an indication of the front (east) wall at the corners of Buildings 1 and 2. Tooling on the corners of the south wall of Building 1 show that this wall was originally part of the 1868 Tin Shop with Building 1 being added on to the north. The west wall and about a metre of the adjoining north and south walls are cement rendered. This, along with the series of rectangular 70 centimetre deep pits with drain pipes in their bases. located in the floor against this wall, suggest some form of wet process in use in this part of the building.

Pilasters on the south wall either side of a large, blocked up arched opening and lead flashing a little higher, suggest the upper ceiling and roof heights, while a mortice socket in the east pilaster may indicate the upper floor height and. A large bluestone sill sitting on the top of the remaining west wall may indicate a former door or window, probably to the upper level.

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249 Illustrated Australian News 5 October 1868.

250 Subdivision Plan, Allotments 5, 6 and 7 and Part of 4, Sec. XXI at Maribyrnong, Parish of Cut Paw Paw, County of Bourke, 1908, Vale Collection, State Library of Victoria.

251 *Australasian Sketcher* 19/4/1873

A small section of Building 2 (which later contained the corrugated iron Humes foreman's office) appears to have been constructed into part of the space of the earlier building, probably after the 1873 fire. A bluestone pitched lane runs from a blocked up doorway in this room between what was the east wall of the Butcher shop and the projection of Building 2. This probably provided access between the Kitchen and Tinsmith shop

A partially collapsed, raised concrete platform sits against the east end of the north wall of building 2. This appears to have been made from poor quality concrete with randomly placed wire reinforcement. It would therefore be from the Humes period, but its function is unknown. A stormwater pit is below part of the collapsed section. A timber stair gives access to the upper level on the west wall. This is a modern reconstruction on the site of a stair in use at the time of the Humes factory closure.

The northern end of the area of the former Tin Shop was utilised by the Humes Pipe Company to provide storage and garage space with the erection in about 1942, of a skillion roof running down from the Building 2 extension to the west (former workshop and stable). This was a rough timber framed structure against the south wall of Building 1 extending across about half of the present open space and covering the upper level in front of the workshop/stable extension of Building 2. A steam chamber was in existence (but unused) in 1939 in line with the east walls of the bluestone building. This was demolished by 1971.

Condition

The remnants of the former Butcher/tinshop are generally sound. The top of the west wall may require 'hardening off' ie. repointing with suitable mortar to fix loose stones. The cobbled laneway requires repair. The concrete platform against the north wall of Building 2 has partially collapsed and the remaining portion is in a poor condition. Further failing of the structure is likely as the very soft concrete continues to deteriorate. Protruding reinforcement wire and loose stone and concrete on the east side may pose a safety concern. The area of the former butcher shop is susceptible to regular flooding, as well as being below the 100 year flood level.

Significance

The surviving remains of the former butcher/tinshop are of contributory significance in the manner in which they demonstrate evidence of the pre 1858 structures on the site, possibly part of Raleigh's boiling-down works. The site also has archaeological significance in that it retains structural details and archaeological evidence which may provide further information on the nature of processes and operation of the industries on the site.

Building 2 Raleigh's Boiling Down Works **b. 1848** **d. 1873 (fire)**
MMPC Preserving department **b. 1874**
Humes wire drawing/ moulding shed.

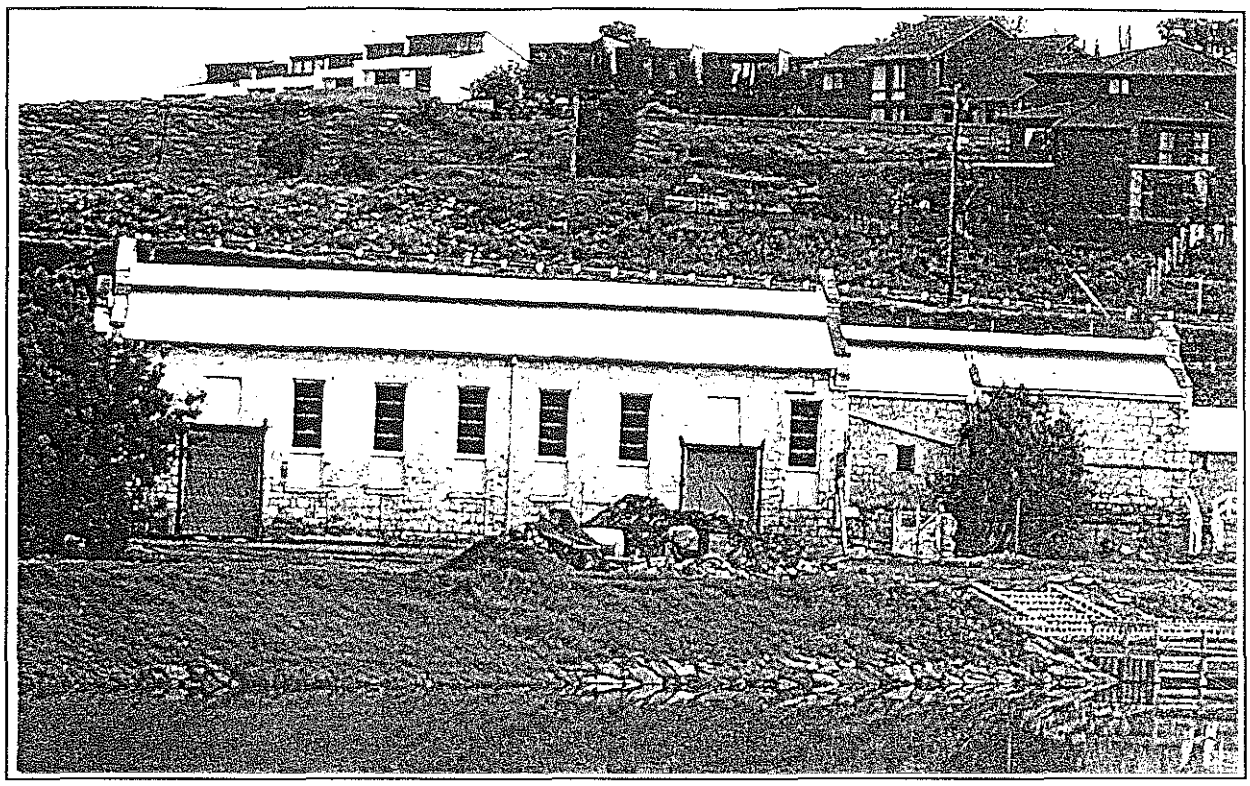

Plate 24. Building 2 from the east 1990.

History

It was probably only after December 1847, when Raleigh bought the land, that he began construction of substantial buildings. (See previous discussion on price paid per acre) A newspaper account of 1854 tells us that it was: 'a well-known boiling-down establishment, in which thousands of sheep and cattle were slaughtered to be converted into tallow'.[253] A plan of 1858 shows that the buildings were of stone and on the banks of the Maribyrnong River.[254] The same plan shows two quarries, which probably were the source of the stone. A watercolour by Greeves shows substantial buildings with a chimney, by the river, and a building with a tower on the hill. The latter is obviously the 'castle' later known as 'Raleigh's castle. The buildings by the river closely resemble the central part of the later meat cannery depicted in etchings of 1868 and 1873. The main difference is that the water colour shows a tower, which is absent from the later prints and photographs.

A *Port Phillip Government Gazette* notice and a directory entry show that Raleigh had a boiling down works, known as 'the Victoria Works', possibly the establishment at Maribyrnong. A notice in the *Port Phillip Government Gazette* announced:

> *Notice is hereby given that the partnership hitherto subsisting between the undersigned trading under the firm of Hassell, Fyfe and Co. in the establishment known as the Victoria*

253 *Argus*, 11 August 1854.

254 Plan of subdivision of Portion 10, Section 20, and Portions 4,5,6, and 7 in the Parish of Cut Paw Paw, in the Vale collection, La Trobe Collection, State Library of Victoria, no date. However, information from Terry Sawyer suggests that Purchas and Swyer were operating between 1857 and 1861. Titles Office information indicates that the land was sold in 1858.

Works on the Salt Water River, near Melbourne, has been this day dissolved by mutual consent. Any debts which may be due by or to the late firm, will be respectively paid and received by the undersigned Joseph Raleigh and William Stuart Fyfe, who will continue the business under the name of Raleigh, Fyfe & Co.

Dated Melbourne this first day of June A.D. 1850

James Hassell
W.S. Fyfe
Joseph Raleigh [254]

The *Port Phillip Almanac* for 1851 refers to 'Raleigh, Fyffe and Co. stock-melters & beef curers, Victoria Works, Salt Water River, office in Melbourne wharf'. The firm of Raleigh, Fyfe & Co. won gold medals at the Industrial Society's exhibition in 1851 for 'best cask of mutton tallow' and 'best cask of beef tallow' and a silver medal for 'best tallow candles'. The firm also showed some 'primary tierced beef' at the exhibition, as did the rival firm, Watson & Wight.[255] A year later, Raleigh announced that the partnership of Raleigh Fyffe & Co., carried on 'at the Salt Water River, near Melbourne' was dissolved.[256] Following Raleigh's death in 1852, and possibly as a consequence of the gold rush's the works appears to have ceased operating.

According to Thomas Flynn, a local school teacher, who gathered up recollections of the district's history in 1906, Raleigh erected large boiling down works at Maribyrnong where 'as many as a thousand sheep were rendered into tallow in a day'.[257]

It is apparent that Robertson, Martin & Smith firm took over Raleigh's works at the time of their contract to the Melbourne & Hobson's Bay Railway Company. were building the engine, they were also extending their works to a new site on the Maribyrnong River. The site was the area now known as Pipemakers Park. Evidence for a possible connection with the study area comes from an article in the *Argus* of 11 August 1854, which describes the activity on the Saltwater River, numerous small craft bringing stone and other materials to town, a floating dock and the quarries in full operation.

But the most striking feature in the change of local aspect is that where formerly stood a well-known boiling down establishment in which thousands of sheep and cattle were slaughtered to be converted into tallow instead of food, there is now being erected a most extensive engineering establishment, where locomotives and machinery of all kinds will be manufactured. The altered circumstances of the colony are expressed by this single fact as if in a history. Where steam was used to destroy the food which there was no population to consume, we now have an establishment for giving a new application to the same power, and making it subservient to the interests of the splendid commerce and extensive immigration which have entirely stopped that old practice of destruction. The establishment to which we refer will be, when completed, the largest in the colony and is being erected by Messrs Robertson, Martin & Smith, who have not only originated the idea of applying the facilities of the river to a manufacturing purpose, but have commenced operations with an energy which forebodes success. Machinery of the most improved kind has been ordered from England, and the firm intend to have their establishment so complete that a casting of the weight of 15 tons may be lifted into a vessel lying alongside the premises. Cottages are also in course of erection for the accommodation of the workmen, and a school will be provided for their children. In short, every arrangement will be made for rendering the establishment complete, and turning to the best advantage the facilities of the locality which are now for the first time being applied to this purpose. The inhabitants of the Saltwater River are occasionally visited by a clergyman but there is as yet no place of worship there.[258]

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254 *Port Phillip Government Gazette*, 1850, p.486.

255 'E.Finn ('Garryowen'), *The Chronicles of Early Melbourne*, facsimile edition, pp. 433-434.

256 *Port Phillip Government Gazette*, 20 October 1852, p.1174.

257 Thomas Flynn, 'A History of Braybrook District', typescript, Braybrook, 1906.

258 *Argus*, 11 August 1854, p.5.

Further evidence comes from a later report in the *Argus*, which describes a meeting held to petition the Governor regarding the obstructive effects of a permanent railway bridge across the river. The petition itself provides information as to the location of the premises of Robertson, Martin & Smith, two and a quarter miles (or 3.6 kilometres) above the junction of the rivers.

> *That your memorialists have been informed, and believe, that it is the intention of a certain company called 'The Melbourne, Mount Alexander, and Murray River Railway Company' ... to cross the Saltwater River at a point about a quarter of a mile above its junction with the River Yarra Yarra, by means of a fixed bridge.*
>
> *That your memorialists, the undersigned William Robertson and his partners, have at the present time from fifteen to twenty ships every week alongside their premises on the banks of the Saltwater River, two miles above the point where the said railway company propose to cross it. the whole of which traffic will be entirely destroyed by the construction of the bridge.*[259]

In the Melbourne Directory of 1854, the firm of Robertson. Martin & Smith are listed as 'Ironfounders' at 200, Little Collins Street East. The *Melbourne Morning Herald* reported on the trial run of the pioneer steam locomotive and referred to the firm's extension of activity to the Saltwater River.

> *This firm is erecting large and complete workshops on the bank of the Saltwater River, with a quay, where vessels can come alongside for repair, and freight can be landed into and work discharged from the factory itself. A cupola is then [there ?] provided, with which a casting of twenty tons can be executed. A steam hammer and a lathe for turning railway wheels of the largest size are expected from England, so that work of any magnitude can be done on the spot.*[260]

The article mentioned that the firm, which was described as a new firm, 'laboured under many disadvantages, of which the cramped space where their operations are temporarily carried on was not one of the least'. While it is possible that the study area was used for manufacturing parts of the locomotive, for example large castings, an account from the *Melbourne Morning Herald* demonstrates that the locomotive was constructed, in whole or in part, in Melbourne. The firm continued to operate at Maribyrnong up to late 1854 or early 1855 according to records of family members in the area. (see historical outline above). The firm ceased operating by July 1855 when the Victorian Government Gazette carried an announcement of the dissolution of the partnership. [261]

In 1868 the vacant boiling down works were purchased by the Melbourne Meat Preserving company for the manufacture of preserved tinned meat. As the *Argus* pointed out, there were already 'certain buildings on the ground, namely Raleigh's boiling-down works' and these served 'as a nucleus to the extensive premises now completed'.[262] The company soon developed 'the best means of adapting the old dilapidated building on the ground to the purposes of the company. To do this properly, necessarily required a considerable expenditure to be made in underpinning and otherwise strengthening the walls.'[263]

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[259] *Argus*, 28 September 1854, p.5.
[260] *Melbourne Morning Herald*, 11 September 1854, p.5.
[261] *Victorian Government Gazette*, 24 July 1855, no.70, p.1709. The evidence of birth cerificates indicates that by 1857 William Smith and his family were living at Mount Blackwood.
[262] *Argus*, 2 October 1868, p.4.
[263] *Argus*, 6 October 1868, p.6.

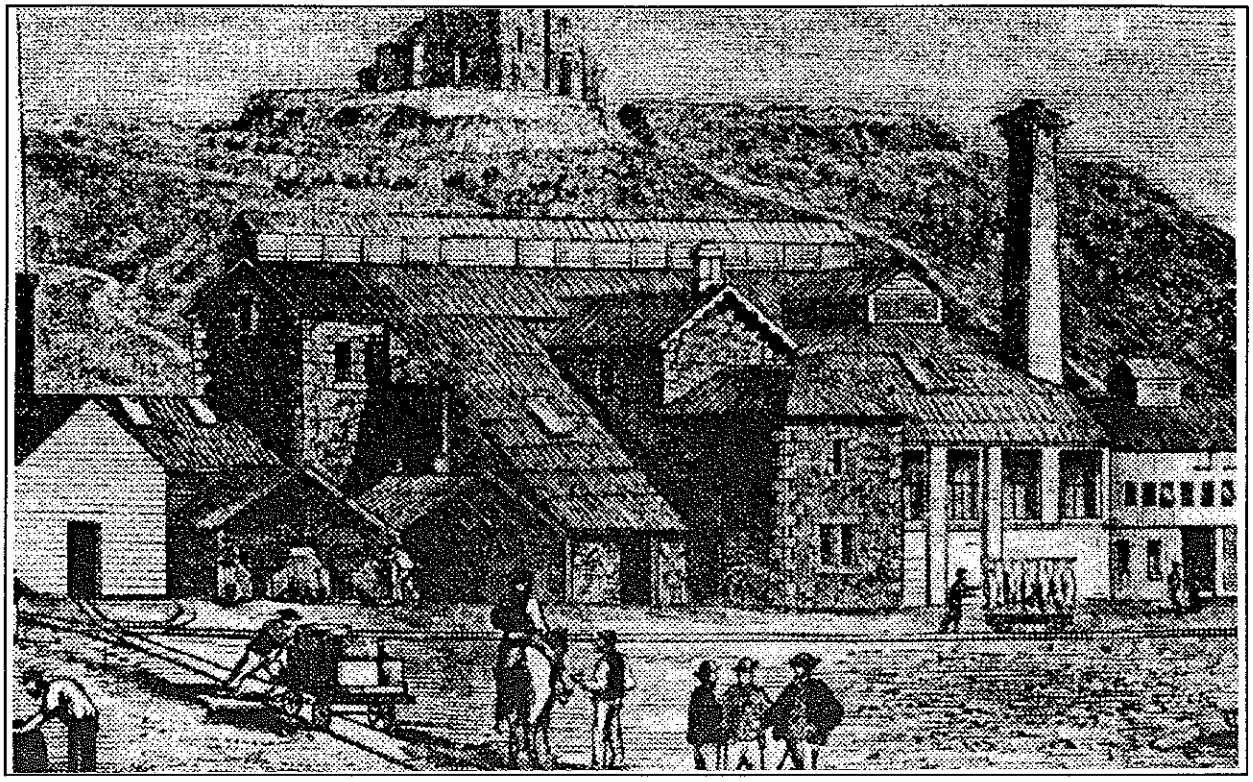

Plate 25. Melbourne Meat Preserving Co. works 1868 showing former Raleigh's boiling down works structures in centre..[265]

The company engaged prominent Melbourne architect Albert Purchas to design the new additions and alterations and engaged John Pigdon as the builder. The Company Manager, Samuel Sextus Ritchie, supervised the works:

> *Under his superintendence, assisted by A. Purchas, Esq., C.E., the company's architect, in the short space of three months, what was but a dilapidated building known as Raleigh's Boiling-down Establishment, has, with some additions thereto been converted into a regular and well-organised factory, complete in all its parts for the various purposes required, and capable of disposing of 3,000 sheep and 50 head of oxen per week.*[266]

Samuel Sextus Ritchie was an experienced meat preserver, with ten years experience in England and Europe. However, the meat canning enterprise was an ambitious scheme. Operations began at the end of September 1868.

> *The works were not completed. There was a good deal to do, but at the same time they had completed them so far that slaughtering was commenced more than a week ago ... The testing room was being proceeded with, and in the course of a week or two they would be in a position to ship to England.*[267]

The fall of the land was used to facilitate operation within the factory, and this was recognised at the time of construction. In common with many industries, narrow gauge tramways were used to move goods around the site.[268]

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265 *Illustrated Australian News* 5 October 1868. p.12
266 *Illustrated Australian News*, 5 October 1868, p.12
267 *Argus*, 6 October 1868, p.6.
268 *Argus*, 26 February 1870.

The main part of Raleigh's boiling down works, a substantial bluestone building, was re-furbished and re-cycled by the Melbourne Meat Preserving Company for its kitchen, preserving room and cooling room. The chimney in Greeves' drawing also appears in later etchings of 1868 and 1873. This central portion is the area currently occupied by the main bluestone building and was the section damaged by fire in 1873, and re-built the following year.

The Preserving Department was the central part of the factory, utilising the bluestone building which was the main part of Raleigh's boiling-down works. The preserving apparatus, soup vats, etc. were constructed by Messrs Robison Bros. of Flinders Street, from designs supplied by the manager, S.S. Ritchie.

The Kitchen adjoined the Machine Room and the Boning or Butchers' department below it. It was a spacious and lofty building, where the meat, on large trays, was immersed in scalding tanks, to scum and remove impurities. Steam lifts carried the trays away to tables, 'on to which their contents are shot. Nimble fingers then place the meat in the tin canisters'.[268] Sometimes a rich gravy was added. The tins were weighed, then transferred to another section, where the lids were soldered on, leaving a small pin hole opening in the lid. The canisters were then put onto huge trays and steam hoists carried the trays up into the Preserving Room.

In October 1868, the kitchen had a large range, for boiling, roasting and stewing the meat, besides braising it, and treating it in a variety of ways. It also had, according to the *Argus* reporter, four iron coppers of 750 gallons each, and several large pans tinned inside.[269] By November 1869, an additional kitchen had just been completed which made possible a more varied range of products, including stews and 'fancy dishes', such as sheep's tongues, stewed kidneys, haricots.[270] In February 1870, the kitchen had six 260 gallon coppers or 'jacketed pans', with space left between the inside and outside coating to be filled with steam, which did the cooking. Stock for soup was boiled in these coppers, since canned soups were among the products of the factory. When ready for soup, the stock was 'drawn off by taps, cooled and passed into the kitchen, where it is placed in the pans with the material that establishes its flavour'.[271] There was also a section for distilling meat extract, in shallow pans at a low temperature. A boy was continually stirring up the 'treacly-looking fluid' with a large ladle.

It was in this large department that 'the most important part of the process is performed'. Here the tins were placed in oblong baths or tanks, six foot by five foot, heated by steam pipes. These tanks contained a chemical solution (calcium chloride), 'capable of being heated to a very high temperature', considerably above the temperature of boiling water. The tins were immersed to within an inch or two of the tops and remained in these baths for two to three hours, according to size. In 1870, there were 100 tins on each tray, which had perforated bottoms. The trays were carried along on 'travellers' overhead and lowered into cisterns 'ranged around the room'. The tins were ready and the food cooked when a jet of air was expelled through the small air hole in the top of each lid. Then the solderers came along with mobile braziers on small trolleys and soldered up the pin hole. This final process was a very delicate one, requiring great skill from the workmen who undertook the task. There was a further period of heating at a high temperature before the tins were hoisted down, through an opening in the floor, to the Cooling Room immediately below.

In this room the tins were lowered into one of a series of cisterns or tanks of cold water. Here 'a continuous stream of considerable volume' cooled the tins rapidly, for a period of five minutes. This was to ensure that the food was not over-cooked. When cooled and cleaned, the tins were transferred to the Testing Room.

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[268] *Argus*, 26 February 1870.
[269] *Argus*, 2 October 1868.
[270] *Sydney Morning Herald*, 23 November 1869.
[271] *Argus*, 26 February 1870.

Considerable changes took place in the main part of the factory in 1874, following a substantial fire in December 1873, when the plant, machinery and cooking and preserving rooms were so much damaged as to necessitate the discontinuance of meat preserving operations for some two or three weeks to come'.[272] The fire threatened at one time to destroy the whole factory, but was put out by' about 50 men employed at the establishment living in the vicinity'[273] and other local residents. The preserving room and cooling room were completely gutted. The cost of damage was covered by insurance, but there was an inquest. The manager, S.S. Ritchie, in giving evidence, ruled out the possibility of arson. 'The men had everything to lose and nothing to gain by the fire'.[274] Thomas Lloyd, butcher, who lived on the premises, first saw the fire and gave the alarm. The insurance figures give some idea of the extent of damage. The damaged portion of the factory was insured for £5,250. This was 57% of the total insurance value. The undamaged portion was insured for £4,000 or 43% of the total value. Operations continued on a limited scale using the facilities of the Australian Meat Preserving Company, further down the river at Footscray.

The factory was rebuilt and repaired over the following twelve months. However, the slackness of trade delayed resumption of full-scale production. By October 1874, work was completed and the *Argus* reported in detail on the 'now completed new factory'.

> *The central portion of the meat-preserving works at Maribyrnong having been destroyed by fire in December last, the directors utilised the misfortune by rebuilding the premises on a greatly improved plan and replacing much of the machinery that was consumed or injured by machines and implements of newer and better design. Concurrently with these changes, some improvements have been introduced in the process of manufacture and the company's establishment is now probably the largest of the kind in the world, as well as the most complete in its arrangements and effective in its working. ...*
>
> *The new central portion of the factory is fireproof, and is so arranged that the manager and overseer can supervise all the more important of the operations carried on in the most effective manner. Railroads extend all through the premises for the more convenient transfer of materials from one place to another, and there are all kinds of lifts, elevators and travelling cranes for similar purposes. Throughout the buildings are well-lighted, ventilated and drained, so as to conduce to the comfort and health of the workmen engaged and to the wholesomeness of the meats manufactured.*[275]

Three photographs of c.1880 give some idea of how the factory looked, after renovation and re-building.[276] One large and long bluestone building replaced the older structure which had once been Raleigh's boiling-down works. This is the building that still remains and is known as 'Building 2'. The new Tinsmith's Shop/Machinery Room (Building 1) was apparently undamaged by the fire and features in these photos. The adjoining building, the Butchers' or Boning Room, and the old Tinsmiths' Shop above, apparently also survived the fire and can be seen in both the photos of c.1880. Many buildings such as the Boiling-down Department, Packing Department, Bone Mill and storerooms appear to have been unaffected by the fire and appear in a photo reproduced in the book, *Sunshine Cavalcade*.[277]

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[272] *Age*, 8 December 1873, p.3.
[273] *Argus*, 8 December 1873, p. 6.
[274] Public Records Office of Victoria, VPRS 407, unit 14, no. 764, 1873. (Fire inquests)
[275] *Argus*, 6 October 1874, p. 6.
[276] Two contemporary photographs in the possession of Mrs R.Ravenhall: 1) View of the meat preserving works from across the river and 2) Close-up of group of employees (in front of Building 1). The photographer is C.Rudd of 91, Little Collins Street, Melbourne, who is listed inthe *Melbourne Directory* for 1882, but not in the years before or after that date. Allowing for a time lag in directory entries, it could be argued that the date of the photographs is nearer 1880 than 1875. A third photograph is reproduced in the book, by C.G.Carlton (ed.), *Sunshine Cavalcade*, which shows a larger view of the whole site and is stated to be 1875. However, since this photo was obviously taken at the same time as the two previously mentioned, it may also relate to the later date, 1880.
[277] C.G.Carlton (ed.), *Sunshine Cavalcade*, Sunshine, 1951, p. 43.

The only detailed account of the different sections or the new sections of the factory at this time comes from a long article in the *Australasian Trade Review* in April 1882. This refers to the destruction of 'the central portion of the original factory by fire' and suggests that 'this apparent calamity was the best thing that could have happened, as it moved the company and the shareholders at large, to make the spirited effort of erecting a larger building and of furnishing it with more effective machinery and appliances.'[278]

Improvements in the intervening period since the fire of 1873 and re-building in 1874, included mainly the introduction of new equipment. A super-heated steam chamber was installed for the drying of tins once they had been dipped in lacquer (copper coloured for beef preparations, brass coloured for preparations of mutton). A new boiler and additional preserving pans and tallow vats were added in 1876.[279] New machinery for the manufacture of square tins was imported from America in 1878, in an effort to meet competition. This 'Yankee' press made the tops and bottoms of the tins and could be worked by one man. S.S. Ritchie invented his own can-filling machine and this was being used in the factory in 1878, filling cans at a far faster rate than any American machine.[280]

At some point, three testing rooms were added. Four testing rooms are mentioned in the article of 1882, whereas there was only one testing room in 1868-73. The company actually did not have the resources to add extensions constantly, since the supply and prices of stock fluctuated as did sales in the markets overseas. On several occasions the works were closed temporarily and only the foremen or the most skilled workers were retained.

The journalist of 1882 commented:

> *It is only when one enters the building that one can realise to any extent the magnitude of the industry that is carried on within its walls, and within the adjoining workshops ... It was, in every sense, a meat market, except as regards the absence of outdoor customers ... Again and again was the work renewed , and kept up throughout the entire room, the same activity everywhere manifested. They cut and cut, as if for very life, each man being an incentive to the other.*[281]

The processes were basically the same:-
* Carcases of mutton were cut up into joints, then sub-divided
*The meat was separated from the bones and fat, and the latter were sent off to the appropriate departments
* The meat was conveyed by lifts to the room overhead, where it was scalded in large tanks
* The meat was removed to the centre of the room where it was placed in tins and weighed
* The tins were transferred to men at another table who put the tops on them
* The tins were removed by lift to the preserving room, a room 300 feet long, and placed on a machine named a traveller', which advances with uniform regularity bearing its freight of tins.
* The tins were let down into the heated tanks and left there the requisite time.
* The tins were removed to the cooling tanks
* The tins were taken from the cooling tanks, dried, and sent to one of the four testing rooms, to be 'subjected to a high degree of temperature before they pass into commerce.

The most noticeable difference between the above processes and the methods of 1868-1873 is the 300 foot long preserving room. This is longer than the main bluestone building on the upper level. This could be an inaccurate estimation of distance. Alternatively, the preserving room of 1882 may have included additional sections, including the northern bluestone section

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[278] *Australasian Trade Review*, 12 April 1882, p.189.
[279] *Argus*, 3 October 1876, p.6.
[280] *Age*, 8 October 1878, p. 3. By S.S.Ritchie's invention, four tins could be filled in one minute while the Americans were only able to fill ten in each hour.
[281] *Australasian Trade Review* , 12 April 1882, p.189.

(sometimes known as Humes' old fitter's and turner's workshop) and an extension to the upper level of Building 2 carrying on to a section of Building 3.

A further noticeable difference in the lay-out of the factory was in the cutting room, which was formerly on ground level.

> *In the front wall of the cutting room there are three apertures which have a downward slope, and under each is a truck that receives the fat as it is thrust through them. When the truck is filled it is borne along to the tallow room, where it is placed in vats to be melted.*[282]

The cutting room may well have been on a mezzanine floor at the southern end of the main building. The existence of a mezzanine floor is suggested by a doorway which can be seen at the upper end of the south wall. The system of lifts, hoists and elevators, carrying the meat or tins on trays, meant that the meat and tins were moved from section to section without the necessity for human handling or carrying.

The factory of 1882, like the factory of 1868-73, was largely self-sufficient. Engineers, blacksmiths and carpenters were on hand when any machinery needed repair. The tins and boxes were made on the premises.

The works appears to have closed in the latter part of 1882, operated intermittently over the next few years and finally closed in 1886 when it was decided to wind up the company. An 1886 sale notice describes the factory and its facilities. The buildings comprised a large bluestone factory, fitted with three steam engines (half, one and ten horsepower); 16 preserving pans; six iron jacketing pans; six large tallow vats; three Cornish boilers, one fitted with Galloway tubes; valuable lathe and tools; travelling cranes; and 'necessary appurtenances for carrying on at a small cost, an extensive meat-preserving business. Listed separately were 'commodious stores, sheds, two slaughter yards, travelling cranes'; 'extensive stabling, containing 18 stalls, hay shed, cart shed etc.' [283]

When 'Hume Bros. Cement Iron Works' was established at Maribyrnong, in 1912-3, much of the existing bluestone buildings were reused for the pipe making process. Harry Pearce re-visited the study in 1982 when he described the area and identified some of the different sections.[284] He recalled the pipe-making process in 1919 as being centred on the main bluestone building, with steam chambers located outside the building.

* concrete mixing
* reinforcement- making
* moulding
* steam curing
* stripping and assembling

The fall of the land was again incorporated into the process with materials delivered on the west side, wire being rolled down a concrete chute into the building. Concrete was delivered from mixers on the upper floor to the moulding machines on the lower floor through chutes. Tramways ran into the building from the east to remove completed pipes.

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[282] *Australasian Trade Review* , 12 April 1882, p.189.

[283] 'Subdivision Plan of Section 21, Allotments 5,6 and 7, Cut Paw Paw', dated 1908, shows 'stabling' etc. on the site of the old slaughterhouse and also between the trrace of stone cottages and the large homestead, formerly the manager's residence.

[284] Harry H.Pearce, interview with Olwen Ford, 4 October 1982. Further references in this section are based on notes made during this interview and subsequent discussions with Harry Pearce. He left Maribyrnong in 1921 on being transferred to Tasmania. Later he was sent to New Zealand and returned to Maribyrnong in 1938, where he remained until 1965. His total period of service wth the Hume firm was 46 years.

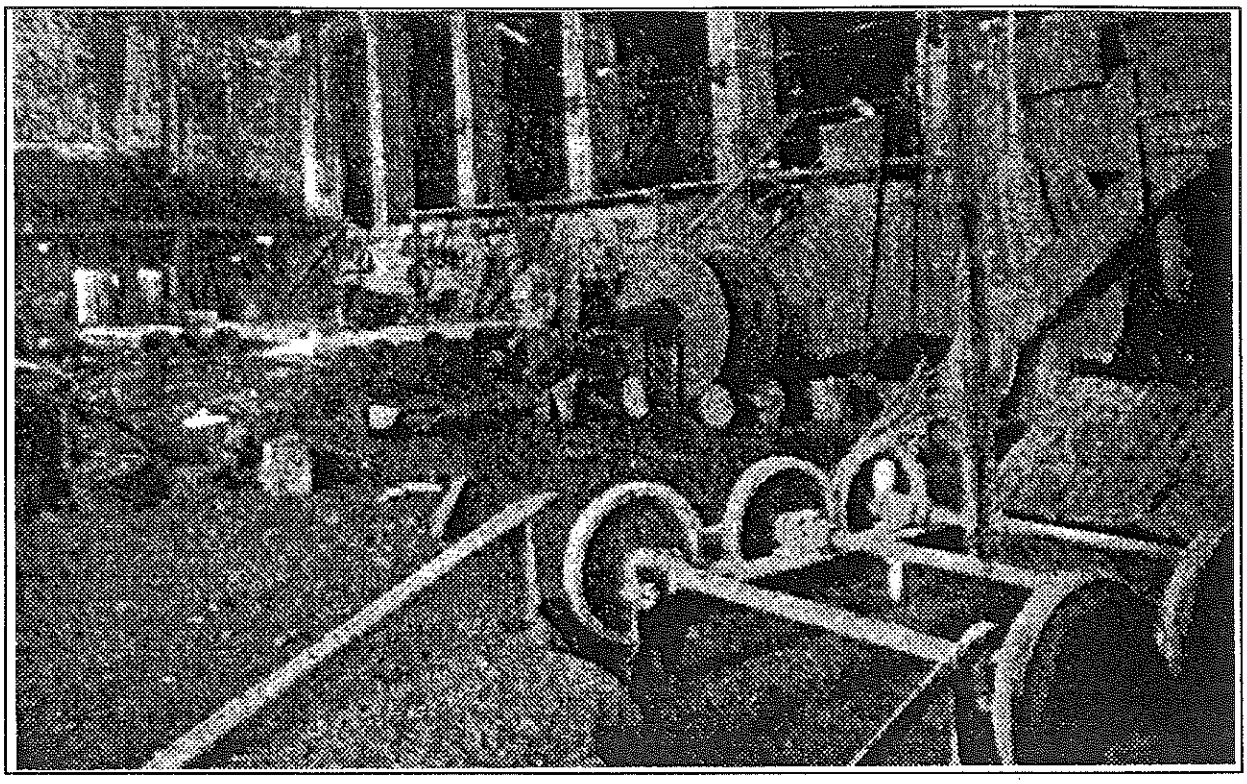

Plate 26. Interior of Building 2 c.1920, showing moulding machines and concrete mixers.[285]

Description

This is the largest and most substantial single building of the former meatworks complex, and is on the site of the original Joseph Raleigh Boiling-down Works, some parts of the structure of which may have been incorporated into the reconstruction, following destruction by fire in 1874. Raleigh's boiling down works was constructed in about 1848 at the foot of the valley escarpment and on the edge of the river flood plain. It appears to have been partially excavated into the bottom of the hillside. The first building appears to have been mostly of bluestone with a long section along the west side with a continuous louvred ridge vent or 'clerestory' and a series of gable, hipped and skillion roofs on the east side.

A small tower is shown on the west side of the building in the c1855 watercolour of the site, but this may be an artistic interpretation to balance with the tower of the castle. A tapered brick chimney with an unusual bracketed cap stood at the northern end of the complex. These structures survived up to the 1873 fire, having been reused by the MMPC. A comparison of the 1857-8 plan and later plans suggests the original Raleigh building had a similar footprint to the southern part of the existing Building 2 (ie up to the line of the north wall of the lower section) with the exception of two small sections to the south and east which extend about four metres beyond the later building line. The west wall of Building 1 also exhibits characteristics suggestive of an early date. these include the use of weathered field stone and mud mortar and a much less refined quality in the stone work with irregular sizes and shapes, and uneven coursing. This area of possibly 1848 structure extends along most of the length of the west wall of Building 2 up to the height of the upper window sills.

The existing building comprises two main halls on different levels and at different widths, roofed in composite cast and wrought iron trusses clad in corrugated iron. The trusses are of "Howe" type with "T" section top cords and diagonals and wrought bar verticals and bottom

[285] From Hume Pipe Co. Publication,c.1920, courtesy of Harry Pearce.

"Howe" type with "T" section top cords and diagonals and wrought bar verticals and bottom cords. Connectors are cast iron, including the massive knee braces sitting directly on the walls. Angle-iron purlins join the trusses, and modern wind-braces were installed in 1989.

The roof incorporates continuous vents under a curved ridge. The north and south walls are each gable ended with twin parapets capped in brick and oculus vents fitted with cast iron louvres. A row of brick columns joined with segmental arches supports the internal truss ends and valley gutter. Large bluestone blocks are located at the top of the columns, just below the springing of the arches projecting on the west side. These do not appear to have a structural purpose, but may have previously supported some form of overhead crane, for example, as shown in the 1868 illustration of the preserving department.

The columns have been partially encased in concrete by Humes, as a reinforcing measure and to protect them from vehicle impacts. The columns at the north end of the row have been displaced by the thrust transferred through the trusses from the west wall. A pair of semicircular brick arches in the north wall of the lower level open up to a small, separately roofed area, in which a corrugated iron partition has been constructed by Humes as a foreman's office. This room has a small, boarded up opening on the east wall, with remnants of a glass louvred window. A small extension (evident in aerial photographs) in the corner of the north end was constructed between 1948 and 1951 and was demolished by December 1973.

As well as the longer upper level, the north end of Building 2 also has a small separately roofed section in the corner of the upper and lower sections (later used for the Humes foreman's office). This section has evidence of various reconstructions. Remnants of brickwork suggest two openings at the upper level, into the area of the tinshop, and two arched openings below the present floor - both now concrete up. One of these was partially broached during the MMBW stabilisation works. A hole was cut in the concrete using a jackhammer to a distance of about 1 metre, revealing only more concrete. It is possible that these arches gave access either to the butcher shop, prior to the fire, or to a small basement room following the fire. In either case it appears to have been completely filled. The design of the new building in 1874 was arranged so that the operations could be supervised from a single point, and this area offers the best vantage point over the building. This was recognised by the Humes management when they established their own foreman's office here which still survives.

A new opening has been made in the upper level of the south wall (c1960s), with the jambs reconstructed in modern extruded bricks and with steel lintels supporting the stonework above. A former arched opening in the lower level of the south wall has been bricked up and earth deposited against the outside. Directly above is a brick infill panel with a 19th century cast iron window frame in the top portion. This opening may have originally given access between the boiler house/testing department on the south side and kitchen/mezzanine in Building 2. A small c200 mm hole exists high up on the south wall near the east corner, which may have been for the steam pipes from the boiler house to the preserving department. Also on the lower part of the south wall, is a line of flashing and unpainted stone, indicating the position of a gabled shed which stood on the site of the original boiler house from c1920.

The building has no surviving internal fittings, apart from various wrought iron and steel brackets and bolts embedded in the walls. Several wrought iron brackets can be seen on the east wall, and along the dividing wall. These appear to be nineteenth century, being blacksmith-made, and probably supported steam pipes or other services. Later steel brackets and threaded studs set in the walls probably relate to fittings installed by Humes. The east wall incorporates tall, timber-framed windows, extending from about a metre above ground level to just below the eaves. The bottom panes are boarded up and two windows originally incorporated doorways at their bases. The doorways were enlarged by the Humes Company, around the 1960s to incorporate large vehicle entrances fitted with roller doors. New roller doors were fitted into all three vehicle entrances as part of the MMBW renovations works in 1988.

The west wall has 13 high level window openings (originally 14) fitted with cast iron centre-pivoting window frames. Some windows retain wrought iron bars attached to hooks, evidently

period and have been reglazed as part of MMBW renovation works. Four frames were missing, and have been placed with fixed timber frames. The northernmost window was removed when a concrete ramp or chute was installed between 1951 and 1960 for delivery of reinforcing wire, with a concrete wall at the bottom of the ramp to stop the falling wire.

There are also four lower and larger window openings in the west wall, three of which are matched by light wells in the bluestone retaining wall which is stepped back at each end. The south end appears to be designed to allow access to a doorway (also blocked up) and the north end encloses a brick structure which was possibly a boiler setting or furnace. The larger windows and doorway have been filled in with "Besser" type concrete blocks during the Humes period.

As part of the building stabilisation works in 1986, a large quantity of soil and fill was removed from the west wall of Building 2. This exposed a variety of buried structures including retaining walls, light wells, brick-lined drainage pits, a bluestone pitched spoon drain and brick foundations of what have been variously interpreted as a fireplace, chimney base or boiler setting. The extension of the concrete chute outside the northern end of the building was demolished during the stabilisation works, exposing the brick remains beneath. Concrete slabs layed over the fill some time after 1951, were removed during the excavations.

While not clearly documented, it appears that some of the buried evidence was retained and repaired. The retaining walls were in a state of collapse, and were reconstructed, sections of the flue feature against the north end of the west wall, were tidied up by re-mortaring existing bricks and adding new brickwork. Brick lined pits were reused for stormwater, with new cast iron grills fitted in concrete surrounds at the new ground level, while the spoon drain appears to have been reconstructed on a similar alignment but at a lower level.[287]

Condition

Works by MMBW have stabilised the structure, particularly by removing earth loads from the west wall, repairing brick and stonework, replacing roofing iron and fitting wind braces to the roof trusses. Erosion of mortar joints on external wall surfaces is severe in some places, and require repointing. The internal surfaces were repointed and whitewashed in 1995. The roller door entrances, which incorporate "H" beam lintels, have caused cracking and displacement of the stonework. These are a quite late development in the building's history, as it was used by the Humes Pipe Co. for 50 years prior to their installation.

Floors of building 2 are concrete with evidence of several stages of construction and repair, the most recent being the concreting over of three rubble and earth-filled former acid pits in the north end of the upper level. These pits, used for de-scaling reinforcement wire, are of steel construction, lined with fire bricks. The floor levels generally appear to be at least 150 mm above original floor levels, as indicated by the height of bluestone sills between the brick pillars running down the centre of the building. Some of these sills were removed during the Humes period, and were replaced with concrete lined chutes to allow materials to be transferred from the upper to lower levels.

Prior to recent re-coating, the interior walls featured a coat of pale green paint over several layers of lime whitewash. Re-coating with lime whitewash was carried out, along with re-pointing of stonework, in 1995. The lower level of Building 2 is susceptible to flooding and is below the 100 year flood level, but the upper level (including the former workshop and stables sections) is above all floods.

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287 Site reports A. Donnar, G. Rumble, 27 February 1986, 3 March 1986, 5 March 1986, MMBW file 731/329/0089

Significance

Building 2 is of primary significance as the largest and most intact structure relating to the Melbourne Meat Preserving Co. and directly demonstrates the philosophy of that firm at the peak of its operation when this was the largest and most important meat preserving factory at the time. The open plan of the building reflects the manufacturing and management methods of the time in the need to allow for supervision of the whole process, and flexibility in layout and transfer of product between stages in the process.

Building 2 is of historical significance for its association with a number of nineteenth century meat and by product industries. This includes remnants of Raleigh's boiling down works of c1847-8, which are possibly the oldest physical remains of any industrial enterprise in Victoria. The building is of architectural significance as a very large utilitarian and purpose-built industrial building. The design of the building, and particularly the incorporation of all-bluestone construction with wrought and cast iron roof trusses and purlins and cast iron window frames, demonstrate the adoption of the then-standard fireproof building technology as a consequence of the 1873 fire.

2A Workshop (part of Building 2) **b. 1868 or 1874**

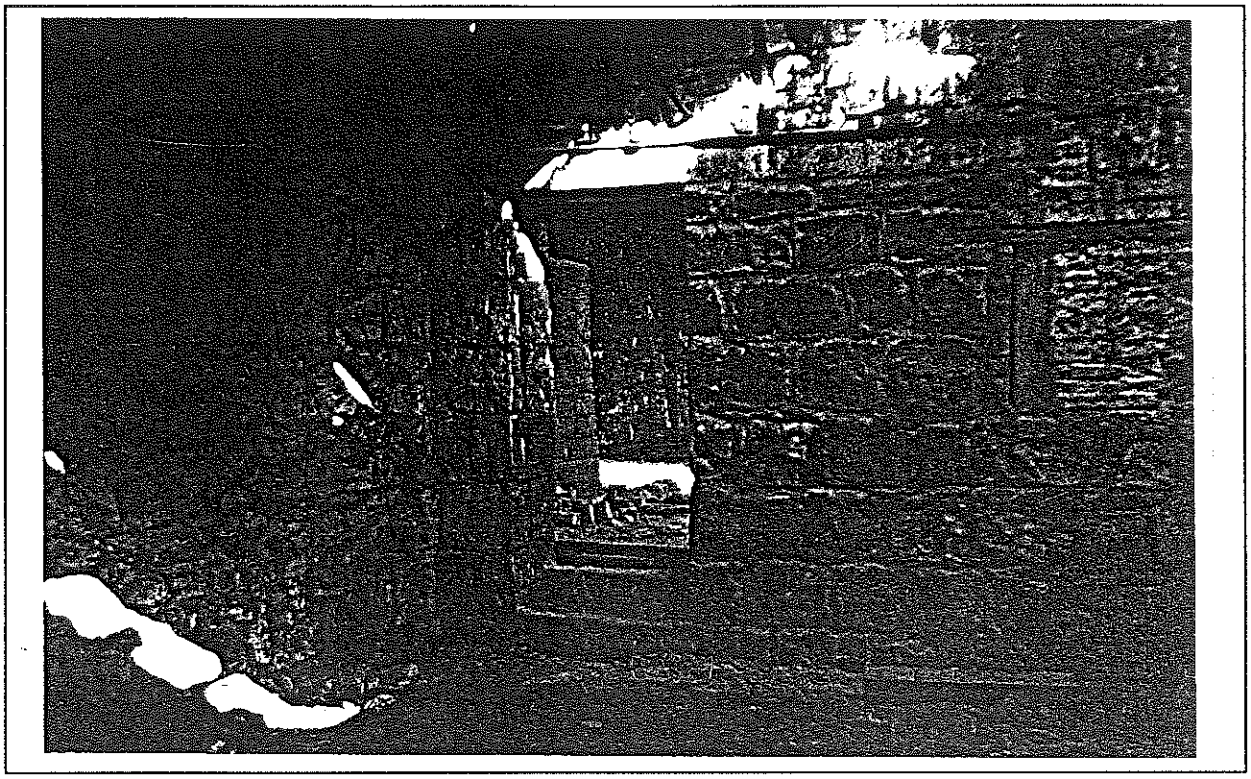

Plate 27. View of Building 2A workshop interior 1986.

History

An " Engineers' Room" is mentioned in the *Argus* article of 26 February 1870. The Engineers' Room had lathes, forges, and appliances for keeping the establishment in order. All tools needed were made at the works. The location of this section is not known, but could have been the back room adjoining the main bluestone building. It was possibly associated with the Machine shop mentioned earlier. An extension to the upper level of building 2 on the north end incorporates a small room which was the engineering workshop during the early Humes period.[287]

During the early years of the Hume Pipe Company activities on the site, their Fitter's Shop was located in the small bluestone shed at the north end of the main bluestone building (Building 2), Here, according to Harry Pearce, there was an anvil, a lathe and a forge. Jack Phillips did any fitting work necessary to be done at the factory in 1919, combining these duties with the task of being chauffeur to the Hume family and the Directors. Jack Bailey was the fitter when Harry Pearce was at Maribyrnong. Sidney Sewell was engaged as fitter and turner in 1923, when he began work at Maribyrnong, but he later recalled: 'I nearly died when I saw the so-called fitters' shop; there was an old bin in one corner with feed in it for the horses, and tools were conspicuous by their absence'. This fitter's shop played an important role in a factory which had increased its plant by over 150%.

Description

The room has bluestone walls and a single pitched timber framed roof. Doorways connecting with Building 2 and on the east wall have been reconstructed by MMBW, while the only other opening is a small slot which may have been for the leather belt to a line shaft hanging from the

287 Hume Pipe Co. (Australia) Ltd. Plan of Maribyrnong Works, Vic. 11/9/1939

roof beams. Cast iron brackets for this line shaft are still in place. Timber shelves are located on the west wall, and timbers and bolts set in the floor indicate the former positions of toolmaking machinery. A small window, now blocked up, is in the south wall - connecting to Building 2. This is probably from the early Humes period as much of this wall appears to have been reconstructed.

The continuous and stylistically cohesive stonework along the west and north walls indicates that the walls of the workshop are contemporary with at least part of the Building 2 structure, it being most likely that they were erected either during the 1868 reconstruction or after the 1873 fire. The roof appears to be missing in the early photographs of the Humes works and the building is not shown in the 1908 plan, suggesting it was derelict between the closure of the meat works and the commencement of operations by Humes. The original roof was probably a similarly pitched skillion which was reconstructed some time around 1920 in its present form.

Condition

Works by MMBW have stabilised the structure including reconstruction of the stonework around the doorways and replacement of roofing iron . Erosion of mortar joints on external walls is severe in some places, and requires repointing. Interior walls were repointed in 1996. The west wall is still out of vertical, leaning in by about 250 mm and the east wall of the upper level has severe cracking and partially dislodged stones (possibly from impact by rolls of wire, before the internal concrete wall was built.

Significance

The workshop is of primary significance for its association with the engineering activities of both the Melbourne Meat Preserving Co. and the Hume Pipe Co. and so can be linked to the important technological developments in pipe manufacture of that company.

2B Stables (part of Building 2) **b. pre 1872**

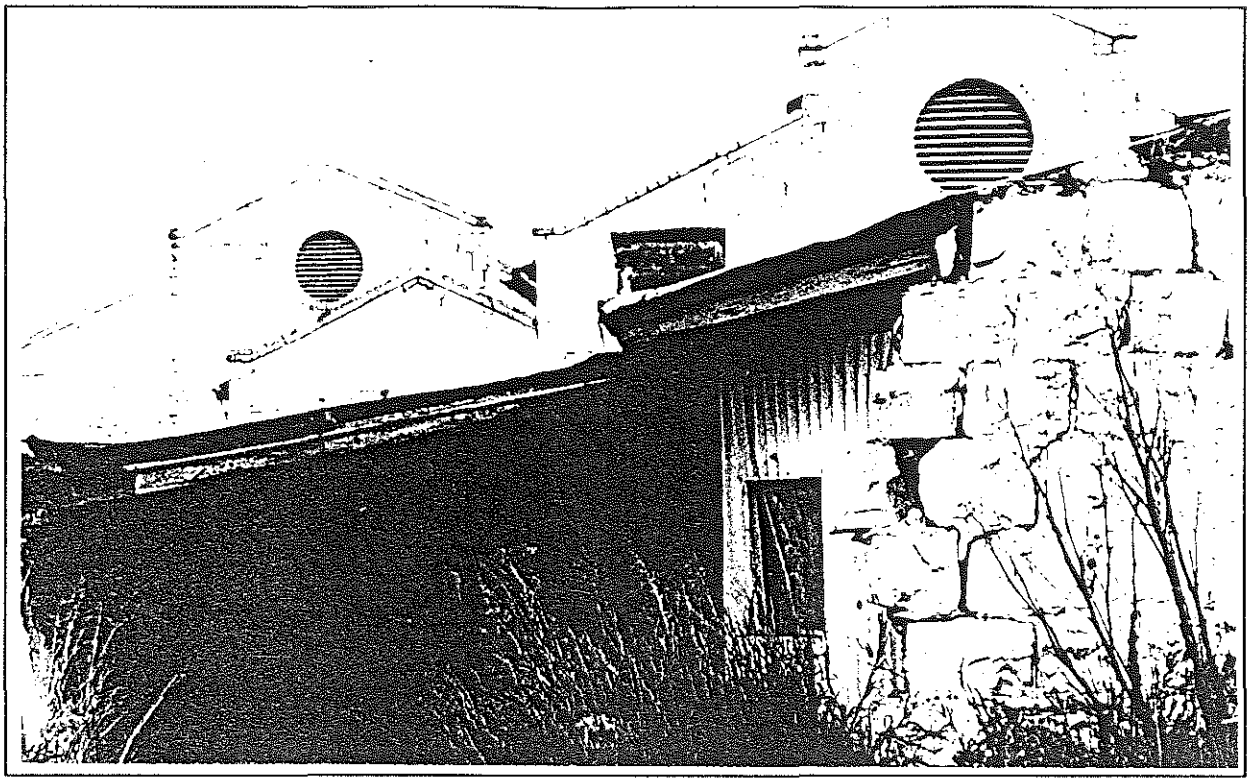

Plate 28. View of Building 2B, Stables in left foreground, c.1978.[289]

History

The 1858 plan does not show either the workshop or stables building, but the 1908 plan depicts a small detached building in the general area. The 1872 photograph of the MMPC shows a glimpse of the north end of the building, with a small brick chimney protruding from the top of a sloping bluestone wall. The chimney may have served a fireplace or forge, and evidence of the flue can be seen in the concreted gap where the bricks have been removed. This begins about a metre from the floor (a good indication that it was a forge) and the top of the wall has been reconstructed in bluestone pitchers. The descriptions of the works in the 1860s and '70s indicate that store rooms, offices, stables and a restaurant 'provided on the ground for the use of the men' were also located in the vicinity of the main preserving building, and may well have been attached to it.[290]

Attached to the workshop on the north end, is a small room, said to have been the stable for the horses 'Tommy' and 'Mary' during the early Humes period.[291] Horses were used to cart stone from the quarry on the hill and to transport pipes from the factory. The stable adjoined the Fitter's Shop. Harry Pearce remembered the horse 'Tommy', while George D'Elton remembered old 'Mary' and her driver, Jack Hoskins, who once backed both horse and dray into the river. He tried to rescue the horse but was docked pay for the time lost.

[289] Photograph by Ruth Ford, 1978.
[290] *Argus* article 26 February 1870.
[291] Harry Pearce, Oral history interview by Olwen Ford, 4 October, 1982

Description

The former stable has a timber framed, corrugated iron clad roof supported on random coursed bluestone rubble walls. The room has a single entrance doorway (new door fitted in 1996) in the east wall, with frames for two small windows beside it, and a reconstructed window on the west wall. Also against the west wall, is a concrete trough, probably a feed trough, thought to date from before 1920 The east wall is timber framed and corrugated iron clad. The floor is of sand and earth apart from narrow strips of concrete paving slabs along the sides. These may previously have covered the whole floor. A socket in the middle of the floor indicates the position of a former post for roof support of stable bails.

The north and south walls appear to have been partially demolished down to the present skillion roof line (although the 1872 photograph indicates a similar skillion form of roof existed at that time) and a large gap in the north wall left from the removal of the chimney bricks, has been filled with concrete. Tooled stonework on the corners of the north wall of the workshop shows that the stable building is a later addition. However, the early 1920s photograph appears to show the stables as an isolated structure, with its roof, but a space between it and Building 2. The 1908 plan shows a different-shaped building, also isolated from the other buildings. It is likely that the adjacent workshop was unroofed and derelict between about 1900 and 1920.

Condition

Works by MMBW have stabilised the structure including replacement of the window in the west wall and repair of the roofing iron. Erosion of mortar joints is severe in some places, and require repointing. The earth floor is uneven and requires levelling and possibly reconstruction.

Significance

The Stables are of primary significance as an integral part of the nineteenth century meatworks complex and as evidence of the use of horses for transport during the first years of the Humes operations on the site and possibly also the Melbourne Meat Preserving Company period. The structure also reflects the ancillary activities such as a blacksmith, during the period of the Melbourne Meat Preserving Company, and has archaeological significance.

Chimney base Building 11 **b. c1868** **d. c1945**

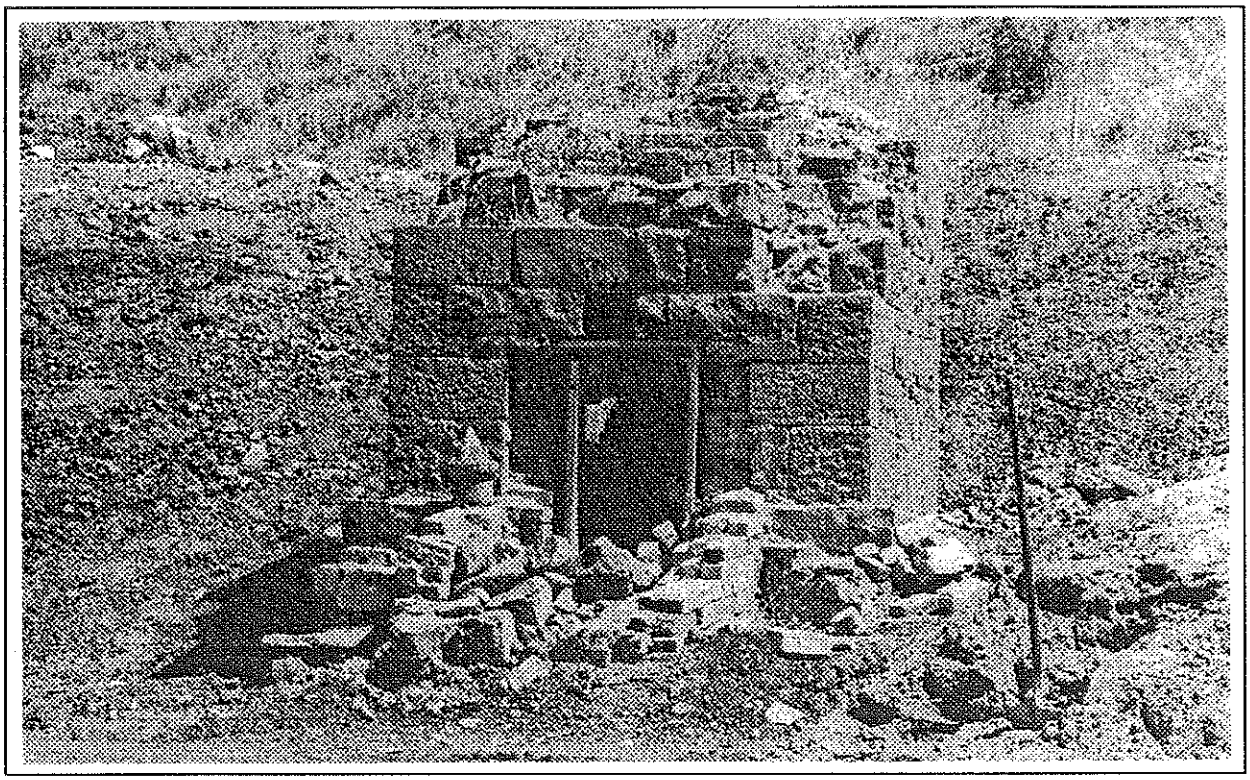

Plate 29. Chimney Base following removal of fill c.1986

History

The bluestone and brick chimney appears to have been erected as part of the 1868 extensions to the factory. It is not shown in the 1850s view, but appears in nearly all the illustrations from 1868 to about 1945.

Description

The surviving chimney base is of coursed bluestone rubble construction with a stepped foundation, brick lining and evidence of an arched brick flue originally extending to the east, i.e. in the direction of the former boiler house site. A small archaeological test excavation in 1984 showed that only a small part of the flue structure remains, immediately east of the chimney. This comprises hand and machine made bricks laid on a thin layer of sand, directly onto clay sub-soil. Most of the area east of the flue appears to have been cleared down to sterile natural clay, during the MMBW clean up operations.

A single block of stone survives from a string course which ran around the chimney at about two metres above ground level. A smaller string-course at about 10 metres high is apparent from photographs. This marked the transition from stone to brick construction. The cap also appears to have a projecting string course two courses high. The chimney as built was about 18 metres (c58 ft.) from the base of the flue entrance. The lower section was bluestone to about 10 metres.

The chimney was probably erected as part of the refurbishment and extension of the site by the Melbourne Meat Preserving Co. in 1868. The 1872 photograph shows scaffolding around the chimney, but this probably relates to repair. It was still in existence in 1939, but appears to have been demolished down to the level of the bluestone plinth between 1942 and 1951. Some bricks,

similar to those remaining in the chimney were noted in the test excavation between Buildings 2 and 3, suggesting it may have been knocked down and the area around it filled. Other bricks reused around the site also appear similar to those surviving in the chimney.

Condition

The works by MMBW for stabilising the main buildings led to uncovering the chimney remains, and in the course of doing so, probably demolished several courses of brick and stone from the top and the surviving part of the brick flue. Subsequent exposure to the elements has caused considerable deterioration, including erosion of mortar joints and crumbling of brick and stonework at the top. Repair to the flue arch was carried out in 1990.

Significance

The remains of the chimney are of primary significance as a key part of the factory alterations carried out by the Melbourne Meat Preserving Co. in 1868. Although a fragment, the bluestone and brick structure is of architectural significance in the way it demonstrates the refined design and sophisticated construction techniques applied to purpose-built industrial structures in the mid nineteenth century. The chimney is also important for its ability to demonstrate the use of steam generation for motive power and heating required by the meat preserving works.

Building 3 (testing department?) **b. 1868** **d.c1940-60**

(part)

Humes reinforcement shed/fitters and turners workshop

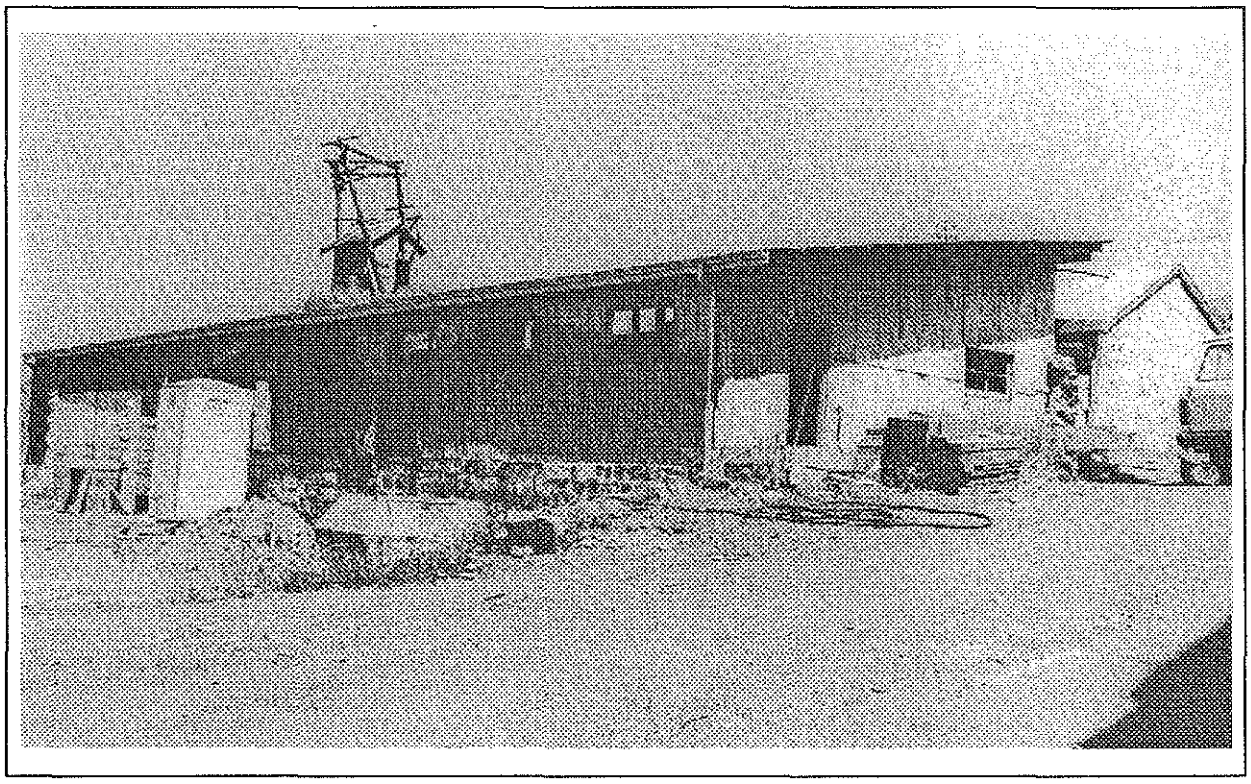

Plate 30. Building 3, Prior to renovation, c1986.

History

Building 3 appears to be one of the additions to the factory of 1868. It is not shown on the 1857-8 plan, but appears in the 1868 illustrations. Its function is unsure, but appears to have housed several ancillary processes of the works, possibly including the boiling down department, and cooperage. The bone mill, packing department may have been housed in timber buildings adjoining on the east side.

According to the *Argus* of 2 October 1868, the Boiling-down House or Melting Department had three 'digesters', five foot in diameter and seven foot in height. These were supplied by Enoch Chambers. The *Sydney Morning Herald* of 23 November 1869 refers to 'three enormous steam vats, where the fat is reduced to fluidity' and passed through purifying vats . It then flowed 'through moveable troughs and into the casks'. The liquid fat looked, to the enthusiastic reporter 'as bright and pure as a fine sherry'. All superfluous fatty portions of meat, marrow bones and, in some cases, whole carcases were sent for boiling-down. In 1870, the 'debris' was packed in trucks and carried on rails to a staging in the melting room from where they were unloaded into six vats, three large, three smaller, made by Fulton's. The total capacity of the six vats was the equivalent to the carcases of 1,200 sheep. The fat was then carried off by spouting for refining and cooling and then by taps into the barrels. The *Argus* journalist of February 1870 commented: 'All the above processes are arranged so that there shall be no handling of the fat, and the human labour required is comparatively trifling'.

Barrels were made at the works, probably adjoining the boiling-down department. The cooperage was outside the Boiling-down Department. Messrs Home & Cox supplied the bone mill itself. Here bones and other debris left in the 'digesters' were ground down for fertiliser.

The Packing Room was an adjoining building to the Testing Room.[290] Here the tins were painted, labelled and packed in wooden cases. By 1869 a circular saw was in operation, cutting the wood to size. From this building trucks ran on rails to the wharf, where they were loaded onto lighters and taken down the river to the port.

Historic Plans and illustrations show that the building lost part of its roof by the early 1900s, had it restored during the early period of Humes occupation, and then had the eastern part re-roofed with the present saw-tooth after the 1920s.

According to Harry Pearce, there was no roof on this building when he was working at the factory in 1919-20. Only the old bluestone walls were standing and the building was used as a rubbish dump for bits of machinery. Building 3 was used for mould storage by the late 1930s, while the old slaughter house, built in the meat cannery days, was used to store records such as correspondence. By the late 1920s it seems that Building 3 was partly re-roofed and was being used as a 'Reinforcement Shed'.

A major change was the renovation and upgrading of Building 3 and its use as a spacious and well-equipped Fitters' and Turners' Shop. With a greater number of machines, there was an increased need for repairs to machinery and a demand for spare parts.

> *In later years they did away with the Fitters' Shop [room adjoining Building 2]. They started to make their own plant and set up their own works. They put a roof on [Building 3] and transferred three or four lathes ... In the 'new' building they had drilling machines and all the fittings of a modern Fitting and Turning Shop.*[291]

In the later years, Maribyrnong became an important centre for the supply of spare parts to Hume factories all over Australia. By the 1970s, there were 14 men working in the Fitters and Turners workshop.[292] It had a gantry to lift heavy items such as mould ends. The machines included several lathes, a turning machine and two milling machines.[293] Outside the workshop, at the northern end, was a small garden of pelargoniums.

Description

This structure has undergone considerable alteration but still retains some of its original form and fabric. As built, it appears to have had bluestone walls with two parallel roofs of uneven width, hipped at the south end and gabled at the north end, where the building shared a wall with an earlier bluestone structure. Tooling on the remnants of the north east corner of Building 3 show that there was a structure between Buildings 2 and 3 with its east wall in line with Building 3. Its west wall was probably in line with the west wall of Building 2. The turnaround of this infill building is shown in the c1929 aerial photograph and archaeological test excavations carried out in 1994, confirmed the continuation of the wall to the north.[294]

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[290] *Sydney Morning Herald*, 23 November 1869.

[291] Harry Pearce, interview with Olwen Ford, 28 September 1982.

[292] Bill Tepper, conversation with Olwen Ford, 1987. Bill Tepper was a fitter at the factory for many years.

[293] Aldo Caposeina and Garth Knobloch, recorded interview with Gary Vines on site, 13 August 1987.

[294] 'Aeroplane view of the works of the Hume Pipe Co. (Aust.) Ltd., Maribyrnong, near Melbourne, Vic.' from a company publication c.1929.

The infill structure was already demolished by 1908, and a narrow 'covered way for wire straightener' was in its place by 1939. This was demolished some time between 1942 and 1951.

Of the original bluestone walls of Building 3, the west wall and half of the north and south walls survive intact, while the east wall only survives to a height of about 1.5 metres (the present floor height of the building). A brick section in the west wall has two cavities with flues underneath. Some of the bricks lining the flues are imported Scottish fire bricks.[295] Outside, these connect to a pit with fire holes and a vertical flue. Inside are the remains of cast iron channels for doors. A possible interpretation of these features is that they are cooking ovens.

Internally Building 3 retains some timber structure from the original western portion of the roof. Trusses and the massive main supporting beam appear original, but the central row of columns has been replaced as part of the reconstruction of the eastern portion of the roof as a pitched floor with west-facing roof lights. One of the original chamfer-ended, morticed shear-heads survives in place in line with the trusses, while the remainder have been removed and the new columns are out of sequence with the trusses. Two rows of paired columns run down the centre of the building. The innermost of each pair have timber shear-heads attached with mortices which originally supported an overhead travelling crane.

A series of timber and corrugated iron sheds were constructed on the east side of Building 3 in the 1930s. 40s and 50s. These were used for storage and garages, with one having an inspection pit for working under vehicles. They were demolished by the MMBW.

The east wall of Building 3 was totally reconstructed by the MMBW in timber stud framing, clad outside in corrugated iron and internally with plasterboard. It is similar in construction and on the same alignment as the original wall, but has much larger windows.

The floor was of Humes concrete paving slabs and concrete, but has had a new reinforced concrete slab laid over it. Some of the paving slabs have been reused as a feature at the entrance.

A new toilet block was constructed in 1988, in concrete blocks on the south end of Building 3. This work also included the reconstruction of a small room in the south east corner which was a foreman's office and which was totally rebuilt to the same plan and elevations.

Condition

Major refurbishment by MMBW has rendered the building structurally sound and secure. The building has had the roofing iron and stormwater plumbing replaced and the eastern wall has been rebuilt with large picture windows in place of the formerly small high windows. A new toilet block has been built against the southern end of the original structure, distinguished by the different roof heights. Internally the building has been carpeted and the timber framed walls and roof have been lined. However, sandblasting of the stonework and brickwork during this refurbishment has seriously damaged the mortar joints, and destroyed the face of some bricks. Some mortar joints have been inappropriately repaired with high strength cement mortar. Melbourne's Living Museum of the West is a tenant in the building, which they use as their offices, and visitor centre.

The oven and flue structure on the west wall of the building is in poor condition - the cast iron frames have breaks and rust problems, the outside brickwork requires repointing, and the external flue openings have been vandalised, with many bricks having been displaced.

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295 Rod Elphinstone, personal communication to Olwen Ford

Significance

Building 3 is of primary significance as a key part of the additions of the Melbourne Meat Preserving Company. It demonstrates the expansion of the site when the MMPC took over the former boiling down works and gives some indication of the specialist operations which were introduced as part of the integrated meat and by products process which the Melbourne Meat Preserving Company developed. Building 3 is also apparently the oldest relatively complete building on the site comparing with Building 1 - 1872 and Building 2 - 1874. The later raised-roof section demonstrates the adaptation of the building by Humes as their fitter's and turner's workshop.

Building 7 Top Factory **b. c1940 d. (part) 1988**
(4 ft and 6 ft pipe factory)

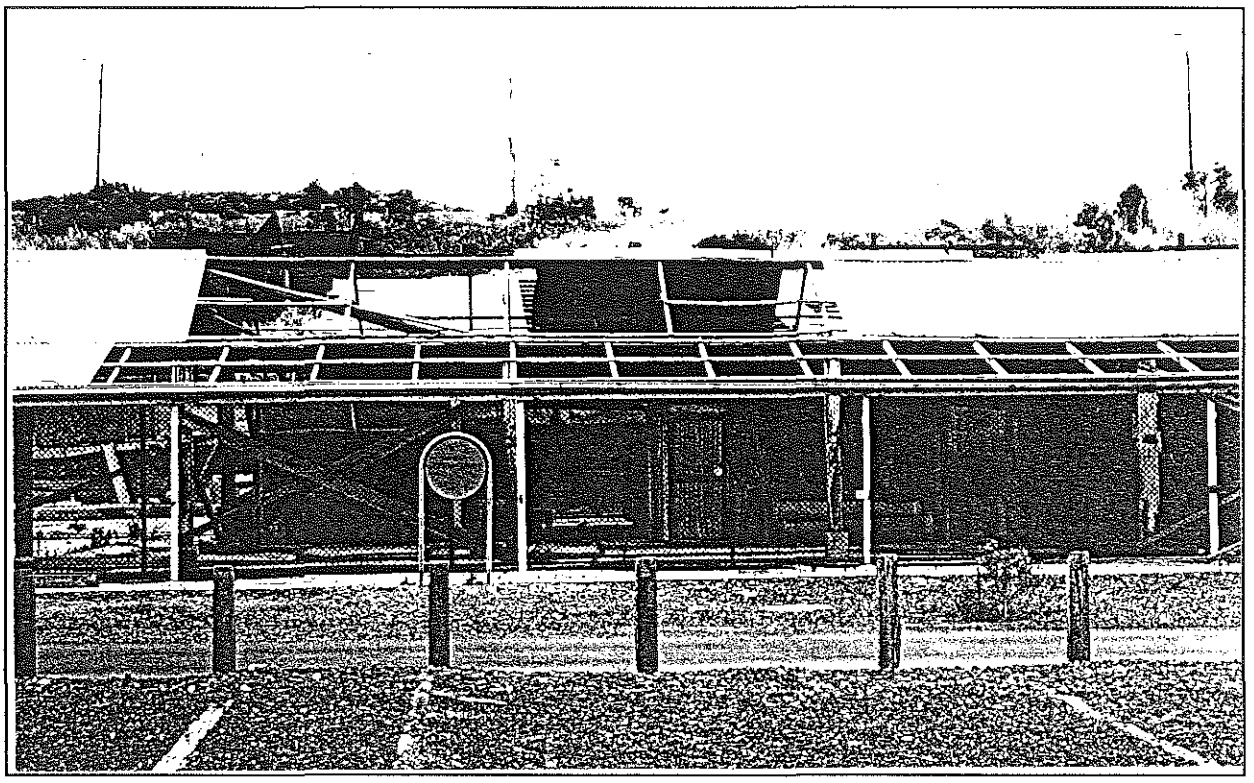

Plate 31. Building 7 from the east c.1986.

History

The top factory does not appear on the 1939 plan, but oral sources suggest it was erected in the 1940s, using timber salvaged from the Hume family home at Maribyrnong (former Warrs Homestead). Harry Pearce, who returned to the Maribyrnong in 1938, has recalled that a lot of timber, and possibly iron, from the old Humes/Warrs home in Maribyrnong were used in the construction. This included especially the lighter wood, such as rafters.

The main part of the shed was for production of six foot pipes. Basically the construction of such pipes was transferred from Building 2 to the Top Factory. The southern end was for the production of four foot 'specials'. The entire range of processes was carried out in the one building - moulding, reinforcement making, steam curing, stripping and assembling the moulds. The reinforcement machine that used to be in Building 2 was brought up here and installed at the northern end of the building. One of the moulding machines , which had originally been in Building 2 was also brought up to the Top Factory. By the 1960s there were four machines in the Top Factory. Each machine had its own number and its own team of men.[296] The reinforcement machine previously installed in Building 2 was also shifted here.

In 1933-34 the first wire-drawing machines were installed at Maribyrnong, 'to draw steel rods more cheaply than wire could be purchased,[297] in gauges appropriate for different reinforcements. 'Wire drawing plant' can be seen on the 1939 plan, located in the centre of Building 6. Acid tanks and a drying oven were located between the 'Wire Rod Storage' area and the wire drawing plant. The acid tanks would have been used for de-scaling the wire. There was also a 'Drawn Wire Storage' area at the southern end of Building 6.

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[296] Joe Bonnici, recorded interview with Gary Vines, on site, 13 August 1987.
[297] G.D.Snooks, p. 258.

Description

The factory comprises three distinct parts: the main moulding shed, the steam chambers and the stripping area. The main moulding shed is a large pitched roof space supported on timber columns and with 'H' beam steel gantries taking some of the roof weight. The gantries were used for cranes for moving moulds. An elevated timber platform, used for storage, is along the western side. Outside the west wall is the stack site for the later concrete batching plant which fed into the concrete mixer inside. A hopper on a travelling crane delivered concrete to the moulding machines immediately below the timber platform. On the east side of the moulding machines, a sunken tramway had a trolley for moving finished pipes to the steam chamber entrances.

The steam chambers are constructed of timber and iron framework with Humes concrete paving slabs used as wall panels, some doubled to create a cavity wall (probably for insulation). The roofs of some are of the same construction, while others are of timber and corrugated iron. The steam chambers are built in four pairs of two each, with open spaces between that were used to return the moulds from the stripping bench to the moulding area. The steam chambers had doors at both ends, fitted into frames and with heavy concrete counterweights so that they could be lifted up and out of the way.

The casing and uncasing area is roofed by a long gable-roofed building built with bush poles and steel supports and having simple timber roof trusses. It is clad in corrugated iron and has always been open on the west side, where the pipes, having been removed from the moulds, were rolled down onto pipe racks to the east of the building. All of the structure shows evidence of considerable alteration that has been carried out in a piecemeal fashion. In some places, posts that were in the way have been cut off near their tops, and angle iron brackets hung off new posts some distance away, to support the section of roof. The alterations were evidently required because of changes in machinery and layout within the building.

Condition

While the top factory is not in danger of imminent collapse, it is in poor condition, with rotten, split or missing timbers, loose or missing roof iron and inadequate drainage. Because of the makeshift nature of the construction, constant repair was necessary, and this was also carried out in a makeshift manner. Split rafters have been reinforced with additional timbers, the rotten bottoms of the posts have been concreted over, or fitted with iron brackets. Substantial parts of the factory have already been demolished. The north end, which housed the reinforcement machines, was demolished in c. 1988 to make way for a car park, while the south-west corner, which contained the foreman's office, storage areas and a 'specials' moulding machine, was demolished c. 1989 due to structural instability.

Significance

Building 7 is of primary significance as the only substantial production building remaining from the Humes period and the only remaining building which can demonstrate the pipe manufacturing process. It is significant as a representative example of the style of purpose-built, vernacular structure erected by Humes, and many other firms, during and immediately after World War II, a period when building materials were in short supply. The building also demonstrates the nature and philosophy of Humes management in the way the company undertook the minimum capital investment in building stock compared with its investment in, and success in, technological developments.

Pipe racks **b. c1920 on d. 1986**

Once extensive areas of the site were covered in pipe racks. These were parallel strips of raised concrete, each about 300mm high x 150 mm wide, used to raise the partially cured pipes off the ground and facilitate moving and loading. They sometimes were formed directly on the ground, and occasionally have small foundations and wire or rod reinforcement. The areas between were generally gravelled and tramways ran across the ends to transport pipes on tracks from factory to storage areas.

Condition

Only one area of pipe racks survives. This is in front of Building 7 on an area terraced in the 1940s by the dumping of fill in the area of the former slaughterhouse (see below). It has been partially landscaped, and although the poor quality concrete strips have begun to crumble, as the area between them has been filled with gravel, they have been kept intact. Another area of pipe racks, west of the bottom factory, has been covered with soil and grassed. The rest of the pipe racks, which once covered most of the flood plain area that did not have buildings, were dug up and removed by MMBW around 1986.

Significance

The pipe racks are of contributory significance in their potential for providing an understanding of the production processes in concrete pipe manufacture and insight to the once extensive storage and curing areas required by the works.

Building 8 Substation **b. pre 1926**

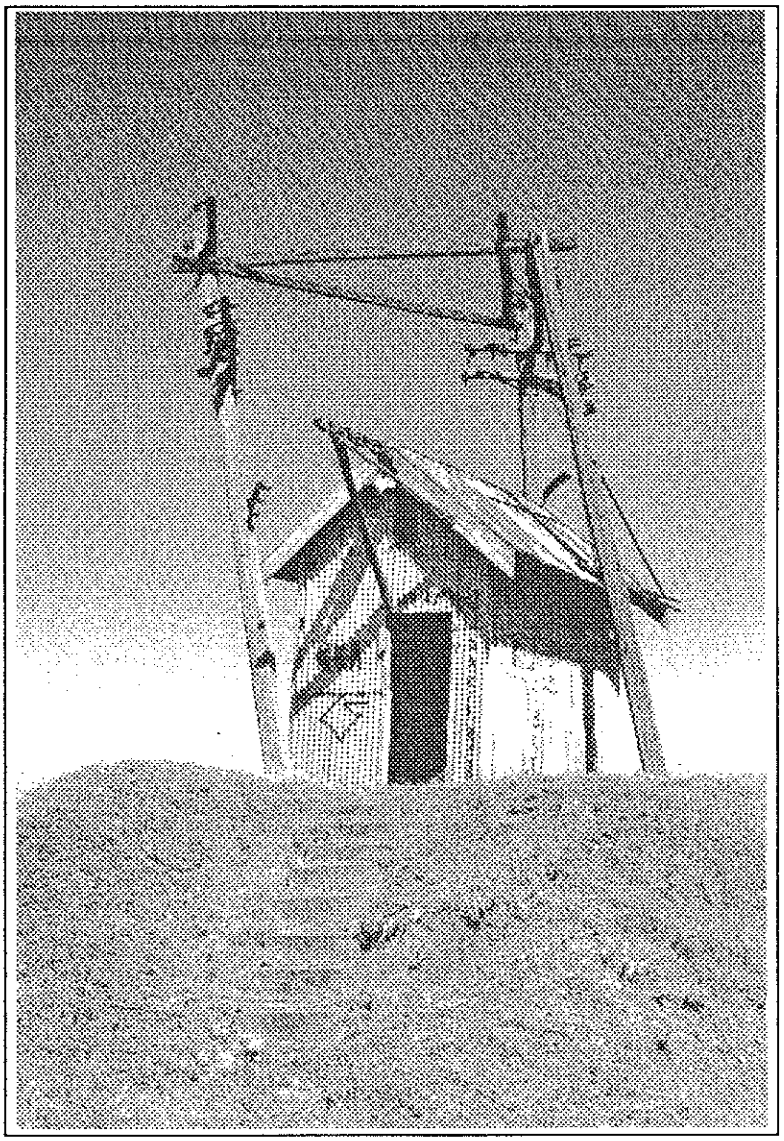

Plate 32. Former electricity substation c.1992.

History

Electricity provided the main motive power at the factory probably from its inception. Harry Pearce remembered that electricity was being used at the factory in 1919 and the plant was driven by an electric motor. G.D. Snooks, in his study of the Humes firm, states that the motor at the Maribyrnong factory was one and a half horse power in 1922.[299]

Description

This small timber-framed, corrugated iron-clad, gable-roofed building set on a small artificial hill was the electricity substation for the distribution of electricity to the various factories. The building is evident in the 1920s photographs of the Humes factory, initially with one electricity pole on its south side, the power lines connecting to poles on Van Ness Avenue. A ridge leading down from Van Ness Avenue suggests the hill on which it sits was formed from spoil from the

[299] G.D.Snooks, 'Hume Enterprises in Australia, 1910-1940: A Study in Micro-economic Growth', Ph.D. thesis, A.N.U., 1971, p.258.

stone crushers and quarries on the other side of Van Ness Avenue. Two additional poles were added later with cross braces. The building has a doorway (door missing) on the north side, a small timber louvred vent in the north gable and a projecting timber braced beam with electricity insulators, but there is nothing inside. A set of concrete block steps leads up to the substation on the north west side.

Condition

The building is structurally sound and in reasonable repair, having had the iron patched and painted in about 1988. The door is missing and rubbish tends to accumulate inside. The three power poles were leaning against the building and so were removed by the MMBW around 1988.

Significance

The substation is of primary significance as an integral part of the activities on the site of the Hume Pipe Company and the oldest surviving building erected by that company on the site. It is also important for its ability to demonstrate the introduction of mains electricity as a motive power for the manufacturing processes throughout the site in the 1920s during a period of expansion by Humes.

Humes workers garden **planted c 1970.**

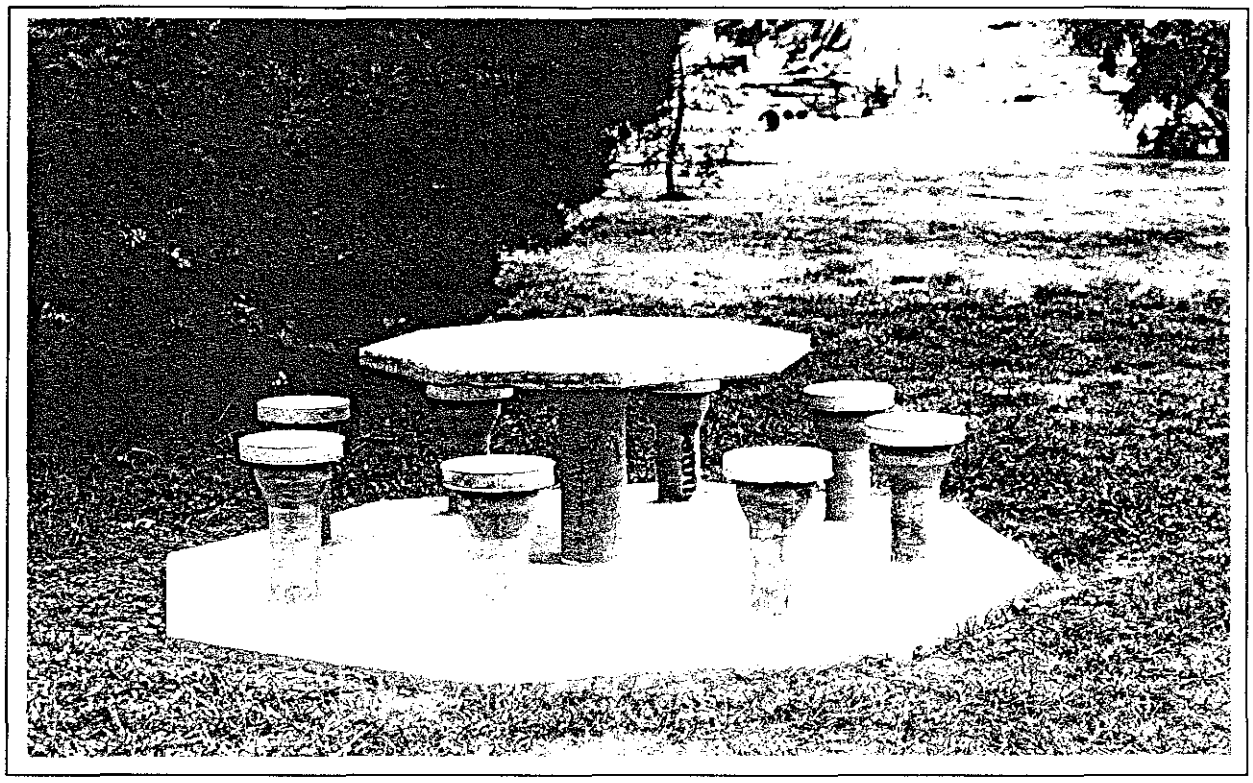

Plate 33. Concrete furniture in workers garden

History

Immediately south of the amenities building, the workers at the Humes factory planted a range of native and exotic trees, in a garden which contained paths leading to the amenities building, with concrete table and stool settings manufactured on site from pipe components, and a barbecue also made on site from sections of concrete pipes. The men themselves made concrete garden furniture and a concrete barbecue. A sign of the changing times was the employees' car park was situated on the eastern side of the study area, near the river. Johnny Caruso, a leading hand at the factory, is said to have been the first to drive a car to work. Previously workers had travelled by bike or public transport. A small staff car park was situated near the office, an indicator of the factory hierarchy.

Description

A small shed once stood on the western side of the garden to house the petrol-engined loco which drew pipes along the tramways to pipe racks. This shed has been demolished, but some of the tramway survives, buried under recent top soil. The surviving trees from the workers garden include:

Common Ash	*Fraxinus excelsior*
Bottle Brush	*Callistemon sp.*
Apricot	*Prunus armeniaci var.*
Nectarine	*Prunus persica nectarina*
Cypress	*Cupressus sp.*

Condition

The workers garden is of low integrity due to the loss of several trees in the last few years. The surviving trees are in good health. While several trees have died since the factory closed, new plants have been added in the area, including red gums, a small bed of herbs including lavender and rosemary and an apple tree.

One set of the concrete furniture has been repaired and another reconstructed from materials left on the site, while a third only has the slab on the ground to mark its location. The concrete paths are badly cracked, and since new topsoil has been spread over the area, they are now depressed and tend to hold water, get covered by grass clippings and get grown over. The concrete pipe barbecue is in good condition, although it is missing its hot plates.

Significance

The workers garden is of contributory significance as a demonstration of the role of the workers, and particularly migrant workers, in the establishment and maintenance of the landscape and facilities on the factory site.

9 Sand chutes **b. c.1960**

Two large welded steel chutes are located against the hillside behind the top factory. These were identified by Elphinstone as part of the stone crushing process, but are more likely to have been used for delivery of sand to the site, with a stock pile kept at the base and a front end loader used to deliver sand to the batching plants at the top and bottom factories. A pair of concrete retaining walls are at the bottom of the chutes and a set of concrete steps runs up the hill just north of the chutes.

Condition

The chutes are in a sound condition, and although they have a surface rust, this does not appear to be progressing any further.

Significance

The steel sand chutes are of contributory significance as they assist in demonstrating the operation of the Humes factory in its later period of operation - in particular the delivery and storage of raw materials to the site.

Small crushing plant (demolished) **b. c.1938** **d. c.1950**
(bluestone retaining wall survives)

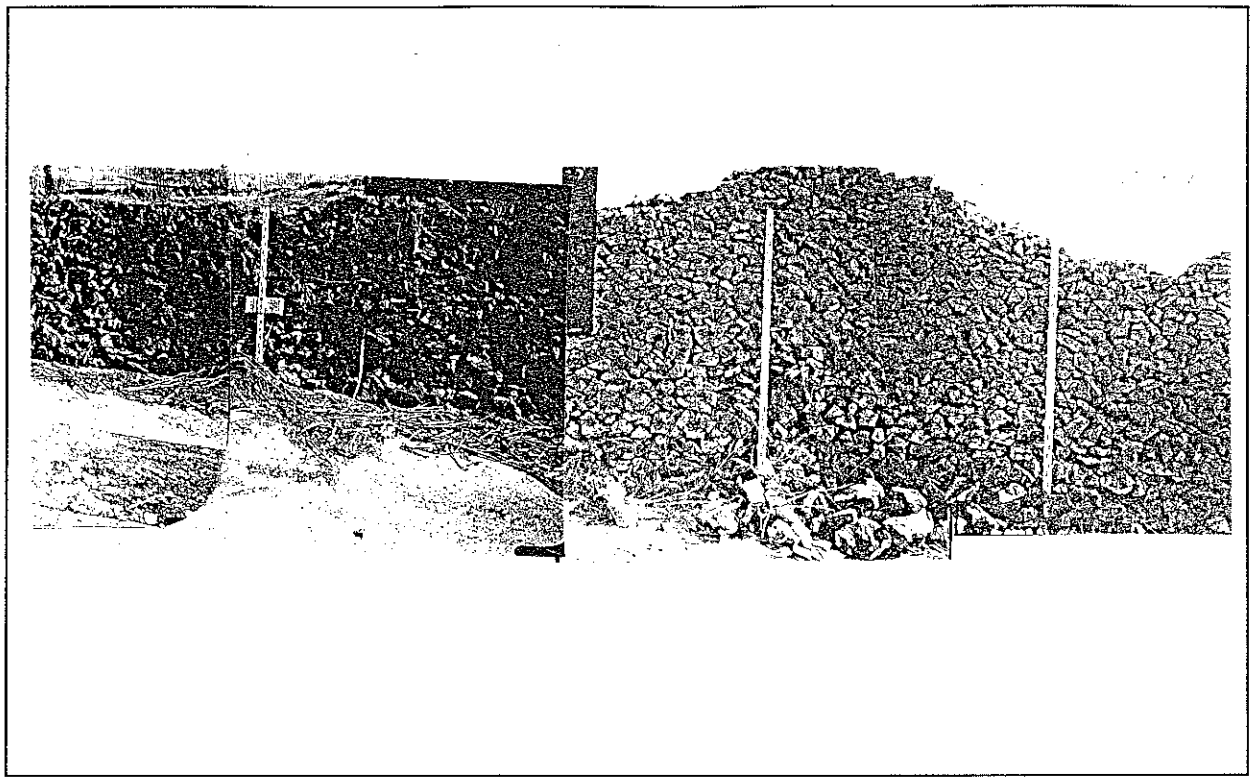

Plate 34. Retaining wall of bluestone spalls from MMBW photogrammetry, 1986.

History

In the 1930s, the site was undergoing some major changes to the landscape. Dumping of quarry and concrete wastes was used to raise ground in several areas. A long tongue of fill was created in line with the main stone crusher (Building 29) to just west of the 8 ft. pipe factory (Building 6). This appears to have been an access track in the late 1920s.[301]

The 1939 plan shows the tongue completed with a small structure at the east end marked 'Stone Crushing Plant - BP A1529', the code evidently referring to a detail drawing. It is likely that the crushing plant was used to further reduce the size of stone brought from the large crushing plant on the hillside to the west (Building 29), with trucks or carts.

Description

The surviving feature of the small crushing plant is the retaining wall made from bluestone spalls (prepared by hand at nearby quarries), roughly concreted together with the joints kept clear so that the effect is of a dry stone wall. The wall may have begun life as a retaining wall for the fill rising behind it. and was eventually used to provide the necessary drop for loading crushed stone into trucks below the crushers. A concrete block structure forms an extension of the wall to the north, and another small concrete wall near the top of the hill is believed to have been part of the later coal drop for the boiler house.

[301] 'Aeroplane view of the works of the Hume Pipe Co. (Aust.) Ltd., c.1929. (The photograph may also indicate the construction of the raised area for a new crusher.)

Condition

The retaining wall appears generally sound but several stones have been displaced. On-going monitoring and repair of any dislodged stone may be necessary.

Significance

The bluestone retaining wall is of contributory significance as an unusual landscape feature demonstrating evidence of the major topographic changes which have occurred on the site as a result of the development of the Humes factory. The wall of spalls (hand-broken blocks of bluestone of a size that can be lifted by one man and put through the primary crushers) is also a good example of the materials and past processes used for concrete manufacture at the pipe works.

Building 6 Bottom Factory (mostly demolished) b. c.1920 d. 1984
(6 & 8 foot pipe factory)

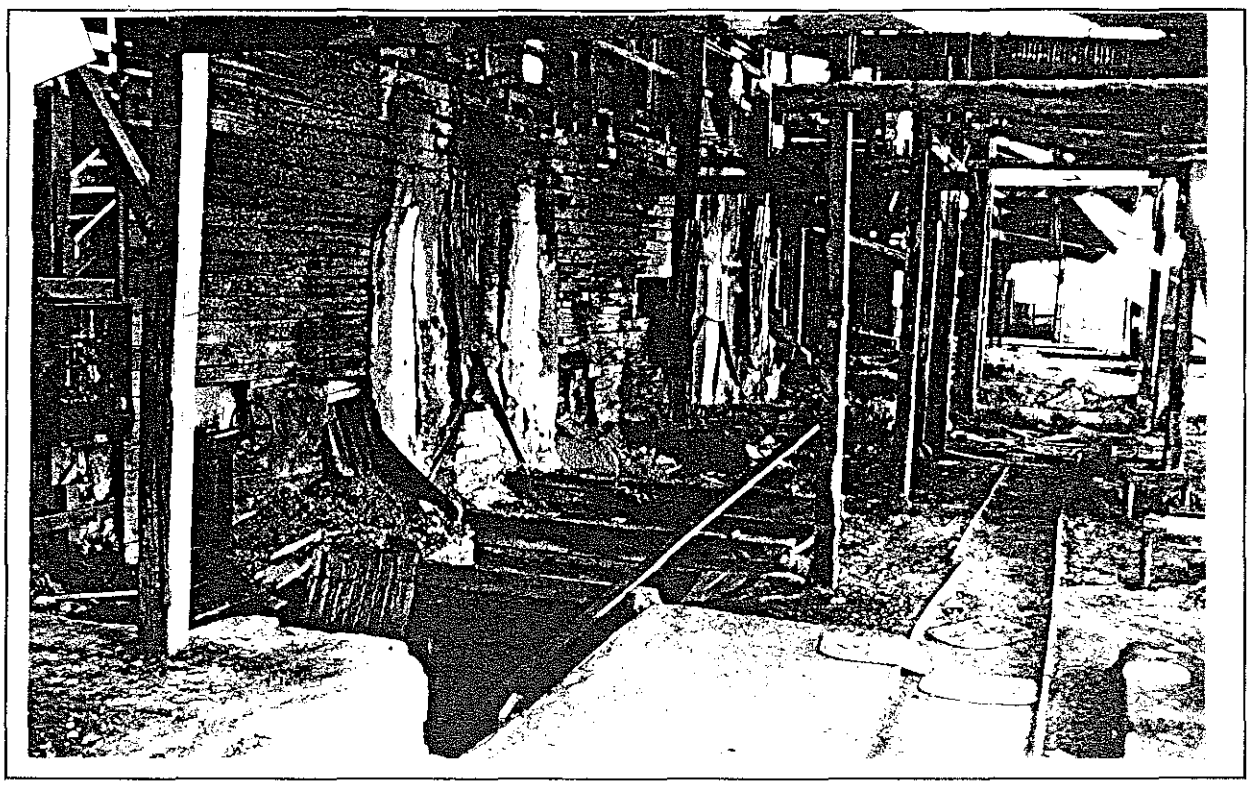

Plate 35. Bottom Factory in 1982 after removal of equipment.[302]

History

The earliest view of the bottom factory is a glimpse in a large panoramic photograph from around the late 1920s. This shows the corner of the 'Moulding shed' and the uncasing gantry. The aerial view from about the same period shows this shed to take up the north-west corner of what became the bottom factory. Another small shelter and steam chamber was located to the south, against a steep bank, evidently formed by the excavation of a slight rise of land adjacent to the flood plain.

The 1933 MMBW plan shows the northern buildings but not the other small structure. The 1939 factory plan shows the factory greatly expanded, almost to its final configuration and indicates the functions of its various parts. The northern end contains the 21" and 48" reinforcement machines and reinforcement assembly area. Moving south in sequence were the 27"- 48"x 8' moulder; 12"-24" x 8' moulder; wire storage and reinforcement assembly; 15"- 18" reinforcement machine; collar reinforcement machine; continuous reinforcement machine; wire storage and wire drawing plan; acid tanks and drying oven (used to remove rust from reinforcing wire; reinforcement assembly; 9" - 39" R.J. moulder and steam chamber; wire straightening machines; drawn wire storage and mould storage.

The plan shows a reinforced concrete retaining wall on the west side and timber and corrugated iron on the east side. Other detached structures are shown on the east side. At the north end are steam chambers associated with the 8' moulders and east of these the casing and uncasing gantry has a building to provide shelter. At the south end is another casing and uncasing gantry with sets of rails connecting it with the main building.[303]

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[302] Photograph by Robert Kewley, Willimastown, September 1982.

[303] 160 ft. to 1 inch MMBW Sewerage Plan No. 204, 1933; Hume Pipe Co. (Australia) Ltd. Plan of Maribyrnong Works, Vic. 11 September 1939.

By the 1970s the bottom factory had altered internally, but the only enlargement appears to be the addition of steam chambers near the south end, and the considerable enlargement of the southern uncasing building, still separate from the main building.[302] The Humes company had a proposal in 1973, to replace both the top and bottom factories with new, probably clear-span buildings, but this was not proceeded with.

Condition

Following the takeover of the Humes site in 1979-80 by the MMBW and the removal of on-site security, the bottom factory became subject to vandalism and fell into a severe state of disrepair. Some sections collapsed and fires were lit, destroying other parts. The building superstructure was demolished in 1985-6 but the concrete slab and some of the machinery bases were left in place. Over the period 1993-5, the Living Museum auspiced several horticultural and landscape projects which resulted in the creation of landscaped gardens over the top of the concrete slab. Some of the industrial relics were also incorporated into the landscaping.

Significance

The remnants of the bottom factory are of contributory significance as evidence of the former extent of the Humes factory in the first half of this century. Although obscured by recent landscaping works, the remnants of the bottom factory foundations still reveal evidence of the first stage of expansion on the site by the Hume Pipe Company and surviving features such as the retaining wall, concrete chutes and machinery bases assist in the interpretation of the pipe-making process on the site. Like the top factory, the site demonstrates the use of the topography to assist in moving materials by gravity during the manufacturing process.

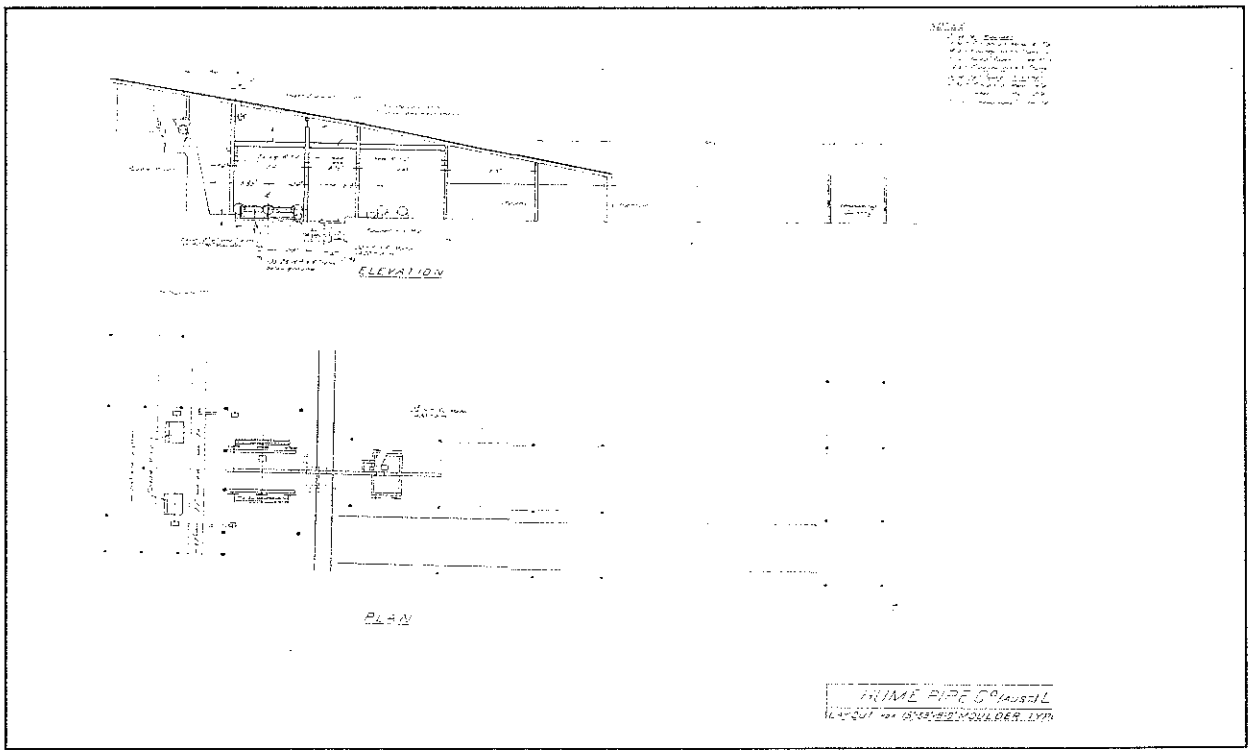

Figure 10. Plan of alterations to bottom factory, 1938.[303]

302 Humes Limited, Maribyrnong Factory, Existing Factory Site Development, plan of works, 4 June 1971.
303 *Layout for 15"-39" x 8'-0" Moulder Type, Maribyrnong Works,* Plan B1531, Hume Pipe Co. (Aust,) Ltd. 14 December 1938.

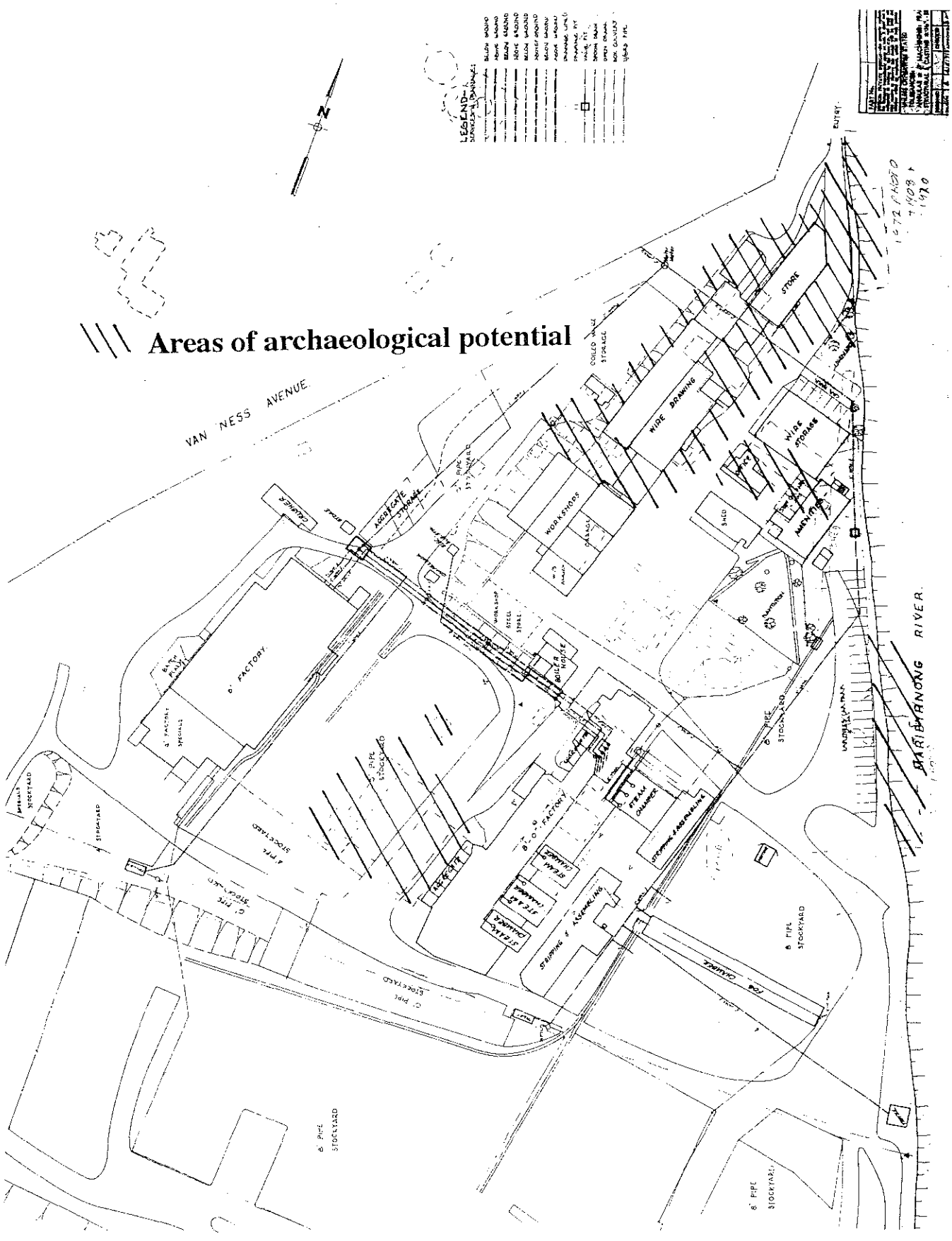

Figure 11. Location plan of areas of archaeological potential (demolished buildings and structures)

3.2 Demolished buildings and structures

(The location of the sites of demolished buildings and structures are indicated on the plan of sites of archaeological potential - Figure 11)

Original boilerhouse & testing room (demolished)	**b. 1868**	**d. c.1900**
Humes garage and testing lab. (demolished)	**b. c.1920**	**d. c.1974**

Plate 36. Test excavation on site of original boiler house, 1993.

History

Below the Testing Room were two boilers of large dimensions. These generated the steam used for driving machinery and for heating purposes, such as to boil the vats in 'the room contiguous', the Boiling-Down Department. The boilers were 'Cornish boilers', twenty-six foot by six foot six inches, fitted with steam chests and made by a Melbourne engineer, Enoch Chambers. The 16 horse power engine was next to the boilers. It served many departments of the factory, being used for pumping, hoisting, grinding, sawing and other purposes. The chimney was 'a handsome stalk' of three foot six inches at the base. The engine was made by Tenant of Glasgow and in 1868 was the only imported piece of equipment in the entire factory.

A boilerhouse, with two under-fired cylindrical boilers in brick settings was located immediately south of Building 2 from at least 1868. This boilerhouse was probably added as part of the MMPC reconstruction of the factory in 1868. It does not appear on the 1857-8 plan. The boilerhouse was clearly linked to the tall stone and brick chimney to the west. The building housing the two Cornish boilers was open to the east side and was probably a timber framed and corrugated iron clad structure. Adjacent to the north, and under the south east corner of the

present Building 2, was an open shed in 1868 which probably housed the steam engine for driving machinery. The boilerhouse probably survived the fire of 1873 but had been demolished by 1908.

No photograph or plan showing the boilerhouse after the 1873 fire has been found, but it is unlikely that the boilers were relocated elsewhere. Physical evidence, such as the five protruding blocks of stone, forming corbels to support roof trusses, and the lead flashing still in place in the mortar course, suggest a roof similar in form to that before the fire, but attached to the new wall after the fire.

A new shed was constructed on the site by Humes, by about 1920. This was used as a garage and testing lab in 1939 and appears to have been a simple timber-framed, corrugated iron-clad, gable-roofed shed. The outline of the roof can be seen in the unpainted stonework on the south wall of Building 2. Here J. Turnbull, a chemist, was responsible for supervising all testing and experimenting at Maribyrnong in the early years of the Hume Pipe Company. He carried out many tests regarding the density and strength of concrete. This included experimenting with 36 inch and 42 inch diameter pipes, so that the pipes could have a rough interior finish, and was carried out by using basalt screenings.[305] This building was demolished after 1974.

The Testing Room, 'an ingeniously constructed chamber', was built of bluestone and was 'at the extremity' of the Cooling Room,[306] possibly in the present space between the Visitor Centre and the main bluestone building. It was heated by a chimney flue which went round the building and 'traversed' it here and there. 'By the use of damper doors, the heated air from the furnaces may be made to pass through so much of their length as may be required'. The tins remained here for six or seven days at a temperature of about 100 degrees Fahrenheit.

> *If any air remains in a canister it is certain here to manifest itself by pressing out the concave top and bottom, and it is therefore cast out. If the tins stand the test of this room for a week, they will keep in any climate for an indefinite period. After passing through this ordeal satisfactorily, the tins are wheeled in trucks to the adjacent building [the Packing Room].*[307]

Description

In 1994, a small test excavation was carried out near the rear of the boiler house. This revealed a partially demolished bluestone wall in line with the east wall of building 3, below a variety of fill and building rubble. A compacted layer about 500mm below the present ground surface and directly over the top of the remaining wall, indicates a ground level in use during the Humes period. This wall appears to be a dividing wall between the boiler house and another early structure originally between Buildings 2 and 3. Tooling on a section of the north wall of Building 3 demonstrates that an earlier building existed between Buildings 2 and 3 of which the excavated wall was part. This wall also appears on a slightly different alignment to the remnant of wall projecting south of Building 2.

In 1996 a substantial bluestone machinery bed was unearthed, roughly in line with the north end of Building 3, at the foot of the concrete steps. This was previously excavated during drainage works by MMBW in 1988, and later backfilled with crushed rock. Only a small part of the bed was visible, the remainder still covered by the concrete steps, path and retaining wall to the north. One large holding down bolt survives (30mm diameter) set in lead. Two other holes for such bolts are evident, in line with the surviving bolt and at approximately 1.7m centres. Marks in the stone and rust stains suggest a large cast iron frame was held down by these bolts. Two smaller bolts, (20m diam) also set in lead, are close to the large remaining bolt. A shallow chiselled recess around these bolts with remnants of lead oxide, suggests they held a bearing carrier. The most likely function of this feature was as a base for a steam engine, supporting the

305 ANU Archives, Humes Ltd., recollections of J. Turnbull.
306 *Illustrated Australian News*, 5 October 1868, p.12.
307 *Sydney Morning Herald*, 23 November 1869.

flywheel and crankshaft. A small test hole on the south side of the stonework showed it extends more than a metre deep, clearly to accommodate a flywheel of at least 2 metres diameter. The steam cylinder was evidently located at the east end of the stone feature.

The south west corner of the Humes period building can be identified by the remains of a concrete wall about 1 metre high, now forming a retaining wall near the concrete steps to the rear of building 3.

Significance

The archaeological evidence of the boilerhouse and steam engine base is of primary significance as an important part of the redevelopment of the factory by the Melbourne Meat Preserving Company and a critical feature for understanding and interpreting the site. They are unlikely to relate to the earlier boiling down works, but further excavation may reveal information on the original form and function and later alterations to the boilerhouse and engine.

Tramways **Various dates**

History

Throughout the history of the site, narrow gauge tramways were used to move materials and finished products around the site. Illustrations of the meatworks period show one or more tramways running north to south along the fronts of the bluestone building, rising up the hill to the slaughterhouse. (This section was probably the balanced incline referred to in historical sources). Other tramways run off this into the buildings and onto the wharves, with points and turntables assisting movement from one line to another. Flat trucks loaded with boxes and tins, and covered trucks with racks for hanging carcases are depicted, generally pushed along by hand.

During the Humes period, tramways were used within pipe factories for moving moulds and pipes between various processes, and a more extensive system of tramways allowed finished pipes to be taken out to pipe racks. A small home-made engine, first powered by a two cylinder diesel and later by a Holden petrol motor was used to tow two or three trolleys at a time. In 1939 tramways ran from the bluestone building into steam chambers, across other lines parallel with the bluestone buildings and along the west side of the steam chambers and bottom factory.

A small opening, closed with concrete blocks in the east wall of Building 2, aligns with one of the tramways on the 1939 plan. Turntables appear to have been used to shift trucks from one section to another. In its last configuration, tramways ran through the top and bottom factory, with a long line extending from the workers garden, past the east side of the bottom factory, and out in two branches to the pipe storage areas, extending across to the Commonwealth land to the south.

Description

Sections of tramway have been lifted during the MMBW site works, and another short section was lifted from in front of Building 2 when service trenches were dug. This section appeared to run directly into the low, blocked-up doorway just south of the north east roller door. A sleeper with dog spikes was unearthed at the same time in front of the south east entrance suggesting the tramway ran into here also. The rails and sleepers were about 30 to 40 centimetres below the surface and are believed to have been from the early Humes period. The locations of the identified artefacts correspond with tramways shown in the 1939 factory plan.

School **b. c.1855** **d. ?**

A school known as 'Raleigh's Punt Church of England School', was located in Maribyrnong and received Government aid for six months in 1856. It operated in a rented building paying rent of 20 shillings a week.[307] A likely candidate for this school is indicated on the 1857-8 plan.[308] It was located above the present Koorie Garden Team works compound on the east side of Van Ness Avenue, about 200 metres east of the junction with Warr's Road. The topography of this area appears to have undergone major changes with the construction of the road. As it is believed that the school was a timber building, any archaeological evidence would be ephemeral and relate to post holes, occupation debris or demolition rubble. Substantial foundations can only be expected from brick fireplaces. A small quarry was located just south of the school in 1858.

Slaughterhouse and covered stockpens? **b. 1868** **d. c.1940**
Humes correspondence store (demolished)

History

Substantial bluestone slaughterhouses and covered stock pens were erected by the Melbourne Meat Preserving Co. in 1868. These were located to the west of the main factory building on a natural rise of ground. The 1908 plan shows what are possibly two masonry buildings with adjoining shelters and the caption 'Stabling & co.'. The slaughterhouse also appears in the nineteenth century illustrations showing a structure with three hipped roofs and a lean-to on the north side.

In picking the site, Ritchie was especially concerned to have good drainage. In the study area he found 'a splendid fall' of 30 feet, which was good for drainage and allowed him to build offal pits below the slaughterhouse. In comparison, the Melbourne Abattoirs were in the wrong place, in his opinion. They were 'too flat', and this caused many problems in relation to cleanliness.[309]

The stockpens were substantially constructed enclosures, at the rear of the slaughter house. The pens were, according to the *Argus* of 26 February 1870, 'covered with open roofs, so that the doomed creatures are not exposed to the weather.' The pens directly led to the slaughter house.

The slaughterhouse, erected by the company in 1868,[310] was on higher ground, 'at the extreme end of the factory and separated from the other buildings by an open space'. It was 80 feet by 60 feet in size, 'substantially built of stone with ample means of ventilation'. It had a row of small killing pens. In 1868 this included one compartment for killing bullocks and six compartments for killing sheep. There was a Yan Yean tap in each compartment. Underneath were 'wooden sparred' or false floors laid as a grating with a bluestone pavement or 'reservoir' and a drain to carry off blood etc. The carcases were hung in a an adjoining shed or room which looked like an enormously exaggerated butchers' shop.[311] The walls of the slaughterhouse were whitewashed every week (every Saturday).

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307 VPRS 61, 56/634, 7 June 1856; 56/843, 29 June 1856; correspondence relating to Raleigh's Punt Church of England School. Government aid only lasted from June 1856 to December 1856. However, 20 children were enrolled at this time, with an average attendance of 14. Edward Hamilton was the master and initially had to provide desks, forms, a table and chair, out of his own money. Parents paid a total of £12-12s in school fees during this time. The Government aid was towards the master's salary and there was also, eventually, a grant for half of the rent.

308 Vale Collection, State Library of Victoria, reproduced in Ford & Lewis, *Maribyrnong: Action in Tanquillity*, p.10. The firm Purchas & Swyer drew the plan.

309 *Victorian Parliamentary Papers*, 1870, vol. 2 (2nd session), no. 22, Progress Report of the Royal Commission on Noxious Trades, evidence of S.S.Ritchie, pp. 57-59.

310 *Illustrated Australian News*, 5 October 1868.

311 *Sydney Morning Herald*, 23 November 1869. *Argus*, 26 February 1870.

This was a large drain, communicating with the main drain, running down into the river. The blood from the slaughtered animals ran down this drain and thence into the river. The drain was paved (with bluestone) and was flushed every night with a copious supply of Yan Yean water. On Saturday afternoons it was cleaned thoroughly. Carbolic of acid or carbolate of lime was used.

The Manure or dung pits were seven large pits dug 'at the fall from the slaughterhouse'. There was an elevation of 30 feet between the slaughterhouse and the lower ground. The pits had solid bluestone walls and averaged ten feet deep. All day long trucks ran alongside the slaughterhouse and took the offal away on a tramway leading from the slaughterhouse to the pits. The offal was thrown into these pits, covered with earth every night and deodorised for manure over a period of months (four to five months).[312] When thoroughly decomposed it was sold to farmers.

Offal was fed to pigs which were kept to be fattened and sold, not for killing and preserving.

The sheep were brought into the slaughter house, ten or twelve at a time in 1868 and 'by a fatal though merciful operation' were 'instantaneously deprived of sensation, and then subjected to the knife'.[313] They were 'polled, disembowelled and skinned'. This took about five minutes per sheep. Work was fast and two men and a boy were supposed to do 210 sheep a day. The boy cleaned the offal and worked at 'fat boards', stripping the gut from the fat. Kidneys and tongues were sent to the kitchen. Bullocks were 'speared' and there were sliding bars or 'simple tackle' to move the carcases, to an adjoining room, a cool and well-ventilated building, where carcases hung from hooks and beams. They were left to hang for seven or eight hours. The sheep carcases were hung on trucks and moved down on the tramway to the next series of operations, the boning room or butcher shop. As this was at a lower level, it was 'reached by gravitation, the descending loaded trucks bringing up the empty ones by means of an endless rope'.[314]

The pictorial evidence suggests that a tramway connected the slaughter house in the area of the pipe racks to the (former) butchers' shop. A tall pole structure on the east side may be part of the haulage system for the balanced incline tramway used to deliver carcasses to the butcher shop.

When Humes took over the site, at least part of the slaughterhouse survived. The 1920 aerial photograph shows a long narrow building with bluestone walls on the north west and south sides. This is also shown on the 1933 MMBW plan and 1939 factory plan. Both show this part of the building which appears to correspond to the western portion of the slaughterhouse. The 1939 plan indicates that Humes used the building as a store, with a projecting south section marked 'Old Correspondence Store'.

By the 1970s records had been sent to Maribyrnong from all over Australia, to be stored in one or more of the sheds there. These included wages records, job applications and shares correspondence, from Brisbane to Corowa. This perhaps can be seen as reflecting the importance of Maribyrnong in the total Humes scene. Melbourne was the firm's Australian headquarters and Maribyrnong was its main factory.

Description

The site of the building appears to have been filled and levelled up to the height of the ridge formed earlier to the north for the small crushing plant. During this levelling process, it is likely that the stones from the slaughterhouse were used to build the present bluestone retaining wall along the eastern side of the pipe racks, forming a suitable loading bay in the process. Some of

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312 *Victorian Parliamentary Papers*, 1870, vol. 2 (2nd session), no. 22, Progress Report of the Royal Commission on Noxious Trades, evidence of S.S.Ritchie, p. 59. The depth of offal was about six inches a day and it was covered with about six inches of earth.

313 *Sydney Morning Herald*, 23 November 1869. *Argus*, 26 February 1870.

314 *Sydney Morning Herald*, 23 November 1869.

these blocks of bluestone show signs of careful tooling, while hand-made bricks, possibly also from the slaughterhouse, have also been used in the wall.

Condition

Considering that the whole area has been raised in height by between one and three metres, it is likely also that the foundations of the slaughterhouse still survive beneath the present pipe racks. Likewise, the seven pits for refuse from the various processes may also survive as archaeological features. However, the location of these has not yet been determined.

Significance

The site of the former slaughterhouse is of considerable archaeological significance due to the high potential for the survival of evidence of a major part of the 1868 Melbourne Meat Preserving Company works.

Wharves **b. c.1868** **d. c.1920**

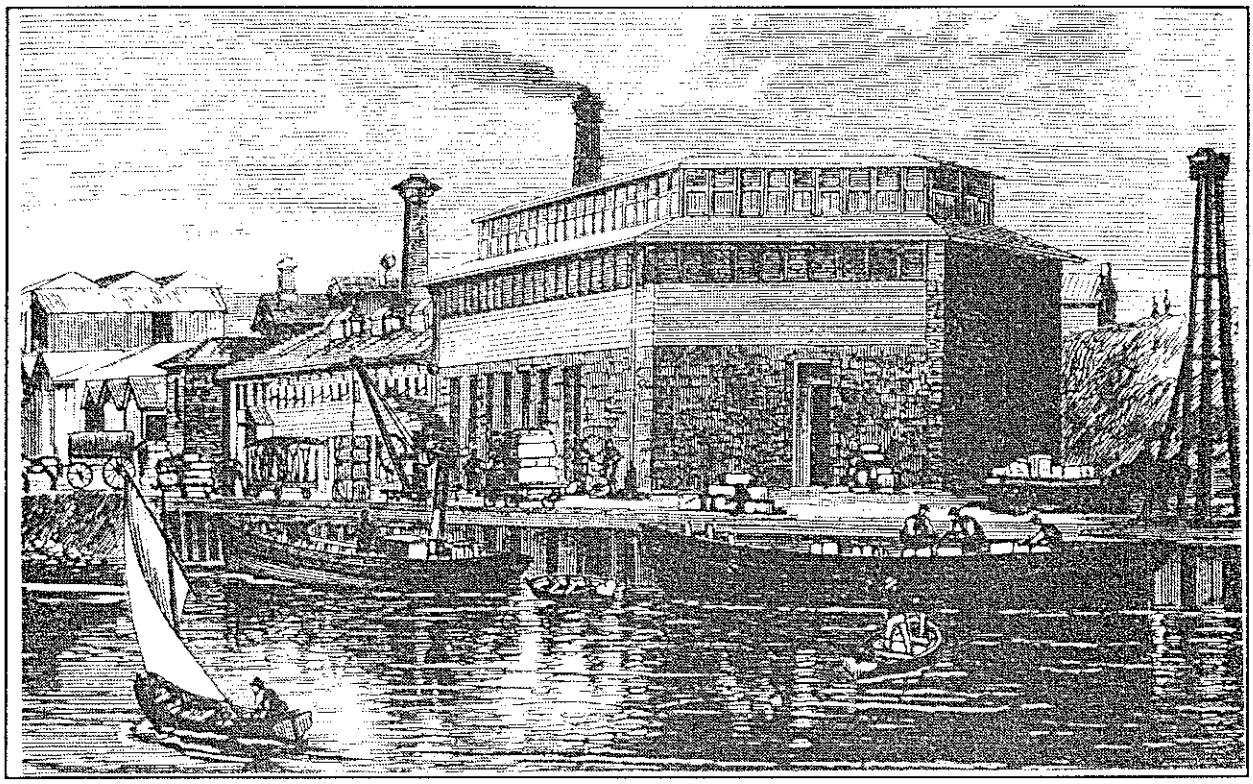

Plate 37. Melbourne Meat Preserving Company's works, 1873, showing activity on the wharves.[317]

History

As the river location was a major factor in the choice of the site by the various industries, the wharves were significant in its history and operation. It is highly probable that Raleigh's boiling down works had a wharf, but this is not shown in any of the plans of photographs. The 1868 illustrations show a wharf, and/or boats tied up at the river bank directly in front of Building 3, with a tramway shown connecting to timber buildings in front of Building 3. This appears to have been a not very substantial structure, simply for mooring boats and providing ramp access.

The 1868 charcoal drawing appears to show a ship moored against the bank with a gangway to the deck, and just downstream, a small wharf with piles into the river bed and a timber crane jib overhanging the river. This structure appears to be dilapidated in the 1880 picture.[318]

The other wharf appears to have been a far more substantial structure, and was located at the extreme north of the site. It is shown in the 1868 charcoal drawing, and is suggested in the *Illustrated Australian News* etchings by the fact that the tramway extends beyond the northernmost building. The 1872 photograph shows a substantial timber structure with round piles at about two metre intervals, in front of sheet piling. Heavy squared timber 'walings' (large horizontal timbers) extend across at river level and deck level. A small jib crane, evidently on skids sits on the wharf. This crane also appears in the charcoal drawing. However, the 1873 Australasian Sketcher view shows a different crane, possibly running on rails, along with several flat trucks. A tall framework shown in both the 1872 photo and 1873 etching could be either a pile-driving device (for reconstruction or extension of the wharf), a navigation beacon, or a crane or capstan for loading or manoeuvring ships.

317 *Australasian Sketcher* 19 April 1873.

318 Shown in 1868 charcoal sketch, 1868 *Illustrated Australian News* etchings, Mrs.Ravenhall's c.1880 photograph and *Sunshine Cavalcade* picture.

In the early years, the Hume Pipe Company appears to have used the river to transport some of the pipes, as Murray Butcher later recalled : 'It was the custom then to send some pipes by Barge down the Maribyrnong River. It was heavy work loading 12 inch by 6 foot pipes without any tackle whatsoever. These pipes had all to be carried onto the Barge and stacked by hand.' Rob Hume remembered :

> *Concrete pipes from the Barge which were taken from Maribyrnong and always unloaded under the Railway Bridge, at Flinders street, as the firm did not have to pay any dues if this was done. There was often trouble about this method of transport and unloading, and the tow rope caught on all sorts of obstacles. Sometimes one of the men would have to dive into the water. If the pipes could not be unloaded that day, the men usually had their bicycles on the barge and then rode to their homes.*[319]

After a major flood, possibly 1919, the barge was wedged into the bank where it remained for some years. Reg. Hume remembers playing there as a child.

The northern wharf survived into the twentieth century, as it is shown on the 1908 plan and appears in the background of the earliest Humes picture c. 1920 but by this time it appears to have been in a dilapidated state. The next view, the aerial view from the late 1920s, shows the area of this wharf covered in fill, probably waste concrete from the factory.[320]

A rusted shaft with a crank handle and gears was recovered from the edge of the river in 1990, which may have been from a wharf crane, or more likely, a dumped Humes artefact.

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[319] ANU Archives, Humes Ltd., recollections of Rob Hume.

[320] Vale collection, 1908; panoramic photo, The Hume Pipe Company Limited, Works Headquarters, Maribyrnong Victoria; 'Aeroplane view of the works of the Hume Pipe Co. (Aust.) Ltd., Maribyrnong, near Melbourne, Vic.' from a company publication c.1929.

Shed behind Building 3 **b. c.1868** **d. pre 1908**

A high, gable-roofed, probably single-storey shed was located to the south west of Building 3 in the area of the later substation (Building 8) with a continuous row of vents or windows immediately under the eaves. This is shown in the 1868 charcoal drawing the 1872 photograph and the *Sunshine Cavalcade* version of the c.1880 photograph. It is not shown on any of the available plans and maps of the site, suggesting it had a short life, probably being constructed as part of the MMPC additions, and being demolished or falling into ruin after 1888 when that company closed down.

Sheds on riverbank (Coopers' department) **b. c.1870** **d. c.1900**

A pitched roof timber and iron shed with two iron chimney flues is shown near the riverbank opposite the main kitchen building in the 1872 and c.1880 photographs. This is the site of the stables shown on the 1857-8 plan. A cooperage is known to have been operated by the MMPC, and may have been this building.

Another 'T' shaped shed is shown further down the river, again close to the bank in the 1857-8 plan. A structure about this area is shown on c.1880 photograph (the wider version in *Sunshine Cavalcade)* but is a rectangular form.

Sheds in c.1880 view **b. pre 1880** **d. pre 1908**

A number of timber and iron sheds are shown in the *Sunshine Cavalcade* version of the c.1880 photograph of the site. These were located south of Building 3, and on the flood plain in the south east part of the site.

It appears that the Australian Frozen Meat Export Company erected new freezing galleries , referred to the in *Australasian Sketcher* 'snow chamber' and condensing cylinders were in a building specially constructed for the purpose, 4,000 cubic feet in size. The new company's works were assessed by the Shire of Braybrook as having a net annual value of £400 in 1881, a substantial amount if we compare it with the value of the Melbourne Meat Preserving Company's premises, assessed as having a net annual value of £700.[321]

The photograph shows the following building, not described elsewhere in this report:

A pair of long gable-roofed open-sided timber sheds near the river bank in front of Building 3. These were probably skin drying sheds.

A tall windowless, gable-roofed building between the skin sheds and slaughterhouse. This may have been the freezing chamber erected by the Australian Frozen Meat Export Company.

A small shed attached on the north east corner of the above building.

A small timber, gable-roofed shed on the riverbank, downstream of the skin sheds, and beside a ruined wharf structure.

A very small, gable-roofed building with tall windows and an internal brick chimney between the river and Building 1. This is about the size and in a similar location to the small Humes office, but is of a different form with the roof ridge oriented north south, rather than east-west.

[321] Shire of Braybrook ratebooks, 1881-82.

Low gable-roofed sheds behind the slaughterhouse. These were probably covered yards for livestock.

All of the above structures are only shown on the c.1880 illustration. While they are out of view in some of the earlier illustrations, one of the *Illustrated News* etchings of 1868, clearly shows the land between the bluestone buildings and the river as devoid of buildings. Neither are the above buildings shown on the 1857-8 of 1908 plans.

Lean-to on Building 2 **b. c.1920** **d. c.1984**

A small lean-to structure on the east side of Building 2 is evident in the earliest views of the Humes works.

Concrete seasoning tanks (demolished) **b. c.1920** **d. c. 1939-60**

The 1920s view of the works and the 1939 plan show long concrete tanks in the vicinity of the Office and later amenities building, and another set of three between the bottom factory and the river. These were probably raised up above the ground, and so would leave little archaeological evidence.

Toilet block (demolished) **b. c.1920** **d. c.1940**

A row of three timber-framed, corrugated iron clad toilets stood immediately to the south of the chimney on high ground behind Building 3. These are apparent from photographs and plans dating from the 1920s and 30s. They are shown in the 1939 plan with a water pipe connecting to a tank higher up to the south, beside Van Ness Avenue.

Slab factory and steam chambers (demolished) **b. c.1920** **d. c.1960**

The slab factory, of timber and galvanised iron, was built between Building1 and the river, with a steam chamber close by. It appears on the MMBW plan of 1933 and the factory plan of c. 1939. The establishment of this new operation represents an example of product diversification, which was to expand during the 1920s-30s. Dan Herilhy came to the Maribyrnong Factory in 1921 and became involved in the experimental stages of the manufacture of concrete paving slabs. His story shows that many of the experiments and improvements at the factory were in fact suggested by the men initially.

> *Mr W.R. Hume and Mr A.J. Webberley set up a plant for pressing the slabs, this was a 4 ton roll, which was manually worked. The concrete had to be semi-dry. I said to Mr Webberley: 'This concrete is not good'. He said 'That is the only way we can mix it'. I mentioned to him that I had just left the baking trade ... and that I had operated a Paddle Mixer, known as a Dough Maker, and that we had been allowed seven minutes to mix four bags [of] dough and suggested to him that this sort of mixer is what was required at Maribyrnong. It took much longer to mix 10 tins Aggregate and Cement. Mr W.R. Hume then made enquiries about the Paddle Mixer from me , and I told him that the agents were Small & Chattel. First day of the paddle mixer at the Slab Plant was an outstanding success. There were 11 men in the team. We turned out 500 slabs a day.*[322]

Shrine, which were all made and laid by the Hume Pipe Company. The slabs had to be in the colour of sandstone. This was the first time the firm had done this, as Sidney Sewell later recalled: 'There was such a variety of sizes that a lot of the slabs had to be handmade, instead of

[322] ANU Archives, Humes Ltd., recollections of Dan Herilhy.

on the machine'.[323] The slabs were but one example of a range of concrete products that the Hume Pipe Company were manufacturing and promoting in the 1920s. Other products included septic tanks, bridge posts, incinerators, lighting standards, concrete columns and concrete bricks. The importance of the Maribyrnong factory in stimulating this development is suggested, indirectly, by G.D. Snooks:

> *The only significant product was the concrete slab which was first manufactured by the firm in Victoria in 1923/24 and was largely responsible for the growing relative importance of other concrete products in the '20s. However they were less important in the growth of the '30s.*[324]

The slab factory was a small group of adjoining, open-sided pitched roof sheds with nearby concrete and iron steam chambers, located right on the bank of the river opposite Building 1. By 1970 the site had been cleared and the area planted with Australian native trees, some of which survive. Considerable dumping of concrete and other waste in the area has raised the level of the ground considerably, and extended the bank into the river, with at least 1.5 metres lying over the original flood plain. (This was exposed during the construction of the new jetty).

Harry Pearce remembered the steam chambers, used for curing the pipes, as being very primitive in the early days. Steam was provided within the steam chamber by lighting a fire under pans of water. [325] Steam chambers were located outside the front of Building 2 and also in the area between Buildings 1 and 2. (See plan of c. 1939 which shows steam chambers as 'Not used'). Sidney Sewell, who joined the Hume Pipe Company at Maribyrnong in 1923, later recalled that the steam chambers 'left a lot to be desired'.[326] It is possible that the company made use of the meat cannery's tramline system to move pipes on 'trucks' or trolleys.

Office (demolished) **b. c.1920** **d. pre 1983**

A small office building with a low pitched roof and gable roof section at the eastern end, was located to the east of Building 2 from the 1920s. Lloyd Sampson was Works Clerk 1940-42, continuing the tradition of male clerical staff. In later years a woman secretary was employed. Managers during these later years included Tom Buzza who was sent to Maribyrnong in late 1940. Eleven years later he was promoted to Works Supervisor and by 1958 was production manager of the Concrete Division for Victoria. Jack Archer is still remembered as a good and fair manager, 'a gentleman'. The last manager, in the 1970s, was Bill Glover, whose total time at Maribyrnong was 30 years.

It appears to have been constructed in timber and corrugated iron and was still in use in the 1970s by which time it had several weatherboard extensions on the north side. It appears to have been demolished and the concrete foundations removed in the early 1980s (certainly by January 1983) following a fire which destroyed the building.

In the early period there appear to have been no clerical staff at Maribyrnong. Successive managers who would have used the office during the early years included Wally Fisher, Bert Wigzell and A.J. Webberley. The first two came from Adelaide. Managers and competent staff were sent all round the country, as the firm developed.

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323 ANU Archives, Humes Ltd., recollections of S. Sewell.
324 G.D.Snooks, p. 142.
325 Notes on interview with Harry Pearce, 4 October 1982.
326 ANU Archives, Humes Ltd., recollections of Sidney Sewell, 9 April 1959.

Conduit Plant/Testing Department (demolished) b. c.1920 d. pre 1974

This group of sheds, steam chambers and tramways are evident in part in photographs of the 1920s. The 1939 plan identifies separate areas for the "Conduit Plant, Testing Department, Store & Machines, Bitumen Plant for Conduit and Steam Chamber", with two short tramways shown.

Building 5 store sheds (demolished) b. post 1930 d. c.1988

Two large, attached, corrugated iron store sheds were located south of the slab factory. These were used for wire storage in the 1970s, when there was a large sign painted on the north wall, and therefore visible as the main entrance sign, with the slogan 'Welcome to Humes Limited Maribyrnong'. The sheds were demolished in the 1980s by the MMBW. Rod Elphinstone suggested that part of this building was formerly the slab factory and recommended it for conservation and retention, but this does not appear to have been the case.

Caretakers residence (demolished) b. c.1935 d. c.1984

The caretakers residence is noted on the 1939 Humes factory plan to the west of Building 2. The 1939 plan shows a small building about 6 x 3 metres with a projecting structure, possibly a porch, about 2 metres square on the south side.

It was a sign of the increased size and value of the Maribyrnong factory and its plant that the Hume Pipe Company had a resident caretaker. His residence or hut was a small timber building probably constructed in the 1930s. It was located on the higher ground just above Building 2. A.J.(Bert) Brain was caretaker/night watchman/boiler attendant from the early1930s. His son , Alan, later remembered: 'the hut was that small that there was only enough room [for a] a sleeping room and the cooking area, and I had to sleep in a 72 inch pipe on the outside'.[326] The living room had a concrete mantelpiece and the bedroom could only just fit a single bed. There was a small porch outside the entrance.

A larger structure on the same site is shown on the factory plans of the 1970s. This appears to show an extension to the east, the removal of the porch and addition of a similar structure on the same side but closer to the east end of the building.

The building was demolished during site clean-up operations by the MMBW in the 1980s. As part of the work to remove fill from behind Building 2, workers uncovered hand made brick structures, possibly relating to the caretakers residence, although the ground level left after the MMBW stabilisation works was left much lower than that prior to the works.[327]

Inspection by Olwen Ford in the early 1980s recorded that the building was very small inside, of two rooms, and while stripped of fittings, it did contain an unusual concrete fireplace surround and mantelpiece, which was stolen or destroyed some time around 1984-5. The building was of timber, and had been badly damaged by fire prior to demolition.[328]

Building 4 Humes boilerhouse (demolished) b. c.1938 d. 1988

Steam was a basic requirement in the curing of Hume concrete pipes. A boiler house is shown on the plan of 1939, south-east of Building 3, but appears smaller than that on 1970s factory plans, suggesting it was either extended or rebuilt. This would have supplied steam to the seven steam chambers in use by the end of the 1930s. Coal was the fuel used in the 1920s-1930s. A new steel-framed and clad boiler house replaced an earlier boiler house in the same location in

[326] Alan Brain, interview with Olwen Ford, 11 July 1986.
[327] Site reports A. Donnar, J. Grinpukel, 12 March 1986, 6 May 1986, MMBW file 731/329/0089 & 796/201/0017.
[328] Site Inspection, Olwen Ford, c.1983.

the 1970s. It supplied steam, through a system of pipes, to the steam chambers in Top and Bottom factories.

The structure standing in the 1980s was of steel frame construction clad in corrugated iron. The boilers provided steam to the curing chambers in various parts of the site through a system of distribution pipes. The boilerhouse was demolished as part of MMBW site clearance works in the late 1980s, and the site was subsequently obscured by the construction of a ramped walkway and hard stand. A concrete retaining wall near the top of the embankment on the south side, is said to have been used in the early period of Humes operations, as a coal drop to the boilerhouse. Remnants of coal and coke waste seen on the site before the construction of the ramp confirm this.

External pressure testing machine (demolished) b. c.1939 d. c.1979

This small square corrugated iron shed was located west of the bottom factory. Its purpose was to test pipes by putting them under compression in a press. It was a tall building, open on the east side. The building was evidently demolished around the time of the MMBW takeover of the site, and today no evidence is visible.

Crushing Plant (demolished) **b. pre 1939 d. c.1979**

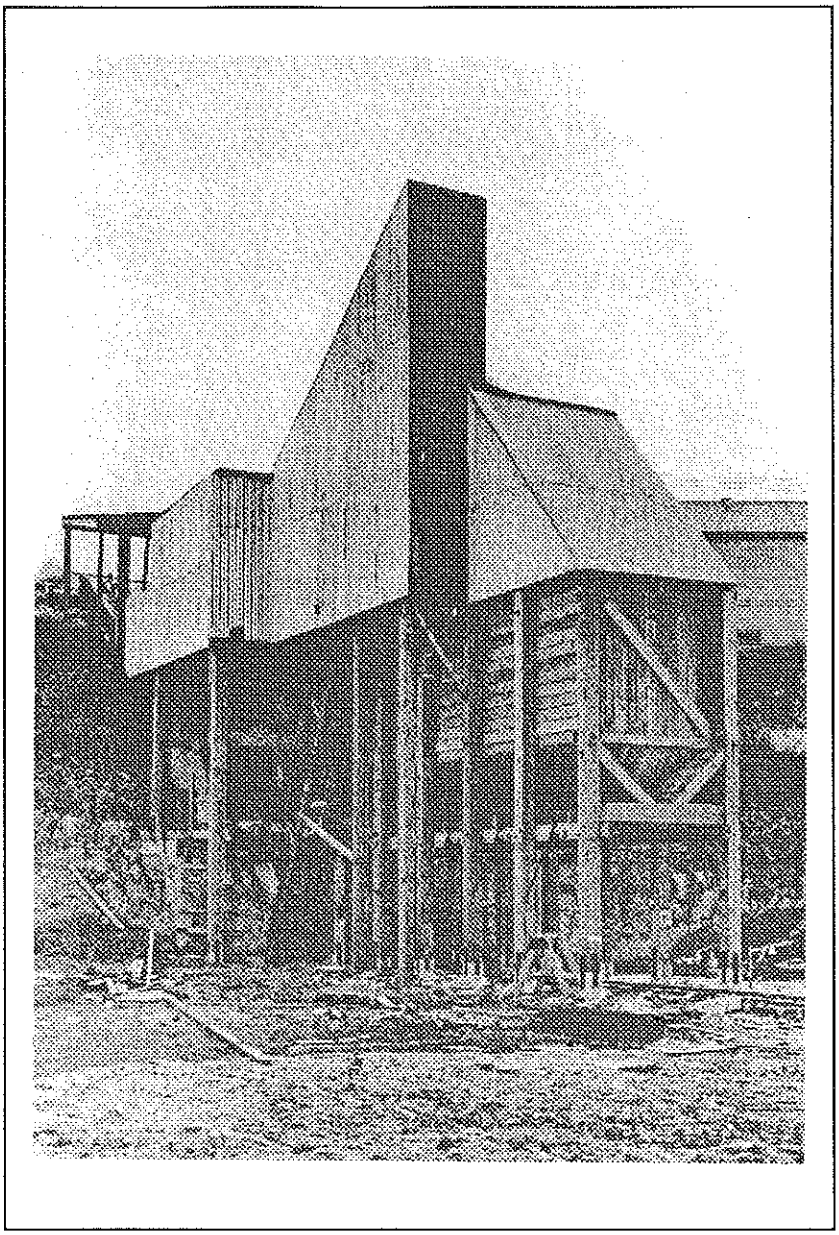

Plate 38. Crushing Plant, c. 1930.[330]

A large stone crusher plant was located against the hillside below Van Ness Avenue from at least 1939. This was an elevated structure built with round bush poles and timber framework, clad in timber, with the appearance of three storeys and an open area at the base. It was located near the north west corner of the top factory. Trucks delivered rock to the top of the building from Van Ness Avenue.

Surviving evidence is in the form of stepped concrete foundations against the hillside, now overgrown. The structure is depicted on the 1939 and 1974 factory plans, but appears to have been demolished some time in the late 1970s.

330 Hume Pipe Company Album, held by Melbourne's Living Museum of the West, Inc.

"New amenities building", showers and lockers **b. c.1939** **d. c.1960s**

Shown on the 1939 plan to the south of the office, they appear to have been demolished by the 1960s, except for the lockers building which may have been converted to the store shed indicated on the 1971 factory plan.

Compressor shed **b.c.1939** **d. c.1984**

A small shed about 2 x 3 metres was located near the electricity substation. It was evidently used to provide compressed air to the top factory (and possibly other areas of the site). The concrete slab with embedded steel mounting plates for the machinery, is known to survive near the gravel car park. A small numbered sign has been set up near it as part of the "Pipe Trail".

Shed east of building 1. **b. c.1960** **d. c.1984**

A corrugated iron shed is shown in photographs and plans of the 1970s, located immediately east of Building 1.

Tester **b. 1960** **d. c.1984**

A small open ended shed was located east of the bottom factory right on the river bank. This was used for pressure testing pipes (evidently by sealing the ends and pumping water into them)

Shed on pipe racks **b. c.1960** **d.1984**

A small tin shed, possible a store or shelter for yard workers, located on the pipe racks, is shown in photographs taken by MMBW in 1983.

Amenities block (demolished) **b. c.1960** **d. c.1982**

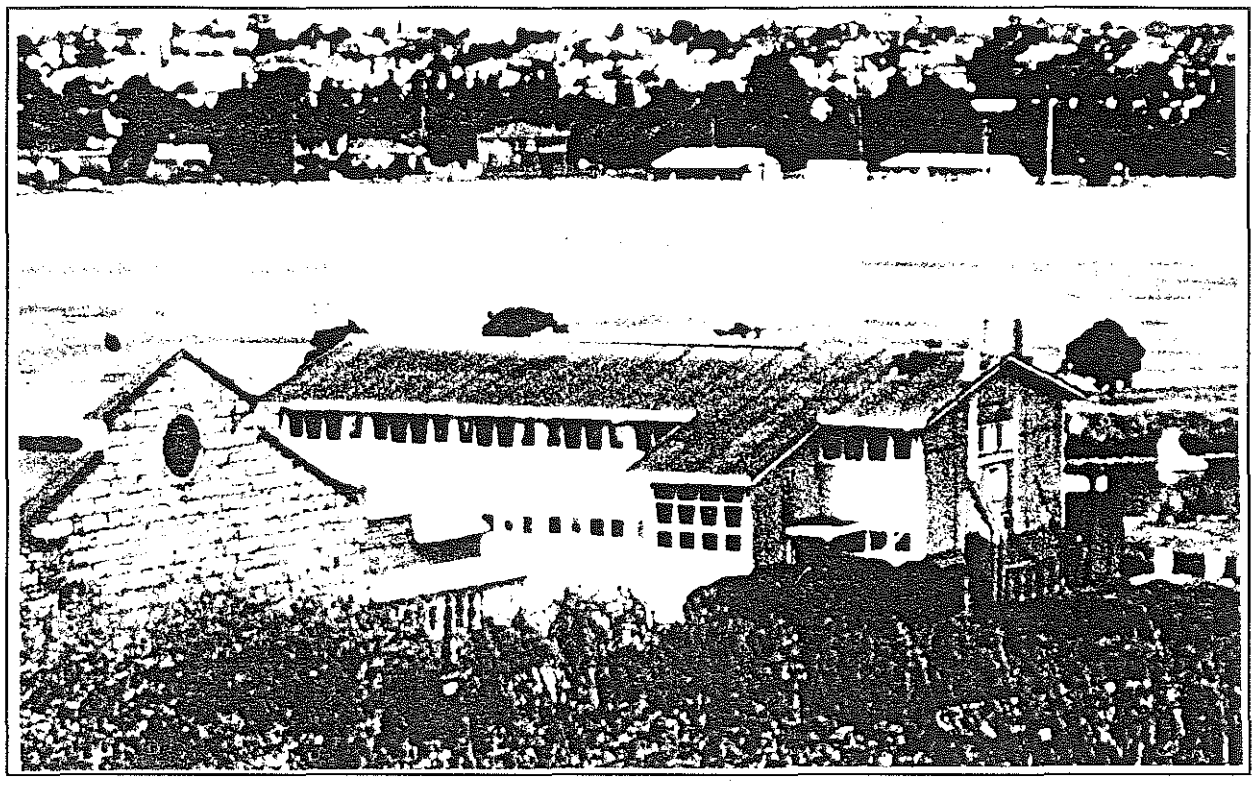

Plate 39. Amenities block, 1974.[331]

A two storey amenities block was located in the area between the office and river, where there were steam chambers and seasoning tanks in 1939. It was constructed in the 1950s and provided changing rooms and showers for the men downstairs and a recreational area with fine wooden floor upstairs. A small stage and piano was there for use at social functions. The amenities building was a timber-framed building clad in weatherboard and fibro-cement sheeting with a corrugated fibro-cement roof. It had continuous strips of windows along east and west walls of both floors and provided change rooms, showers, and a dining room. Internal stairs appear to have been enclosed in a porch on the east side, while external stairs are shown on the north and south ends. The building would have had fine views to the river and valley beyond. It was unfortunately, severely vandalised and partially burnt out after Humes left, and so was demolished in 1982 as a safety measure by the MMBW.

331 View from above Van Ness Avenue of the Hume Pipe Factory, taken several days after the flood of 15 May 1974 had receded. Courtesy MMBW.

3.3 Significance of archaeological sites

Table 4. Potential archaeological sites and areas within the study area.

Building/feature	Dates	Potential for survival of fabric	Nature of surviving fabric	proven (potential) level of significance
Original boilerhouse & Testing Room Humes garage and testing lab.	1848 - c.1900 c.1920 - c.1974	proven	bluestone west wall, bluestone steam engine base - concrete walls	primary
School	1855 - ?	high		(primary)
Tramways	Various dates	proven	sleepers and rails	primary
Slaughterhouse and covered stockpens? Humes correspondence store	1868 - c.1940	high	(bluestone blocks reused for retaining wall)	(primary)
Wharves	c.1868 - c.1920	moderate		(primary)
Shed behind Building 3	c.1868 - pre 1908	low		(little)
Sheds on riverbank (Cooper's department)	c.1870 - c.1900	moderate		(contributory)
Sheds in c1880 view	pre 1880 - pre 1908	moderate		(contributory)
Lean-to on Building 2	c.1920 - c.1984	low		(little)
Concrete seasoning tanks	c.1920 - c .1939-60	moderate		(little)
Toilet block	c.1920 - c.1940	low		(little)
Slab factory and steam chambers	c.1920 - c.1960	moderate		(primary)
Office	c.1920 - pre 1983	high		(primary)
Conduit Plant/Testing Department	c.1920 - pre 1974	moderate		(little)
Building 5 store sheds	post 1930 - c.1988	low		(little)
Caretakers residence	c.1935 - c.1984	low	probably all destroyed	(primary)
Building 4 Humes boilerhouse	c.1938 - 1988	proven	concrete slab	(contributory)
External pressure testing machine	c.1939 - c.1979	low		(little)
Crushing Plant	pre 1939 - c.1979	high	concrete footings	(primary)
"New amenities building", showers and lockers	c1939 - c1960s	moderate		(little)
Compressor shed	c.1939 - c.1984	proven	concrete footings	(contributory)
Shed east of building 1.	c.1960 - c.1984	low		(little)
Tester	1960 - c.1984	low		(little)
Amenities block	c.1960 - c.1982	moderate		(contributory)
Shed on pipe racks	c.1960 - 1984	low		(little)

The significance of the archaeological sites listed above cannot be determined accurately without detailed archaeological investigation and excavation. In many cases the presence of surviving physical evidence has not been proven, but is only presumed from historical sources such as maps and photographs. Where evidence survives, the archaeological sites would be of primary and contributory significance depending on the history and function of the particular sites and the degree of preservation of remains.

However, some archaeological sites have been identified as having surviving remains, either from archaeological excavation, or identification during various excavation work for service trenches, landscaping and excavations. These remains take the form of footings, collapsed and buried structure and refuse from the manufacturing process. Table 4 (above) also makes an assessment of the potential level of significance of the archaeological sites listed.

3.4 Features outside the study area various dates

A number of other sites in the vicinity of the study area played an important part in the history of the various industries on the site. These have been referred to in the historic background, and are depicted in some of the plans and photographs. They are listed here with brief details of their location, and potential for archaeological remains, as no visible remains can be seen.

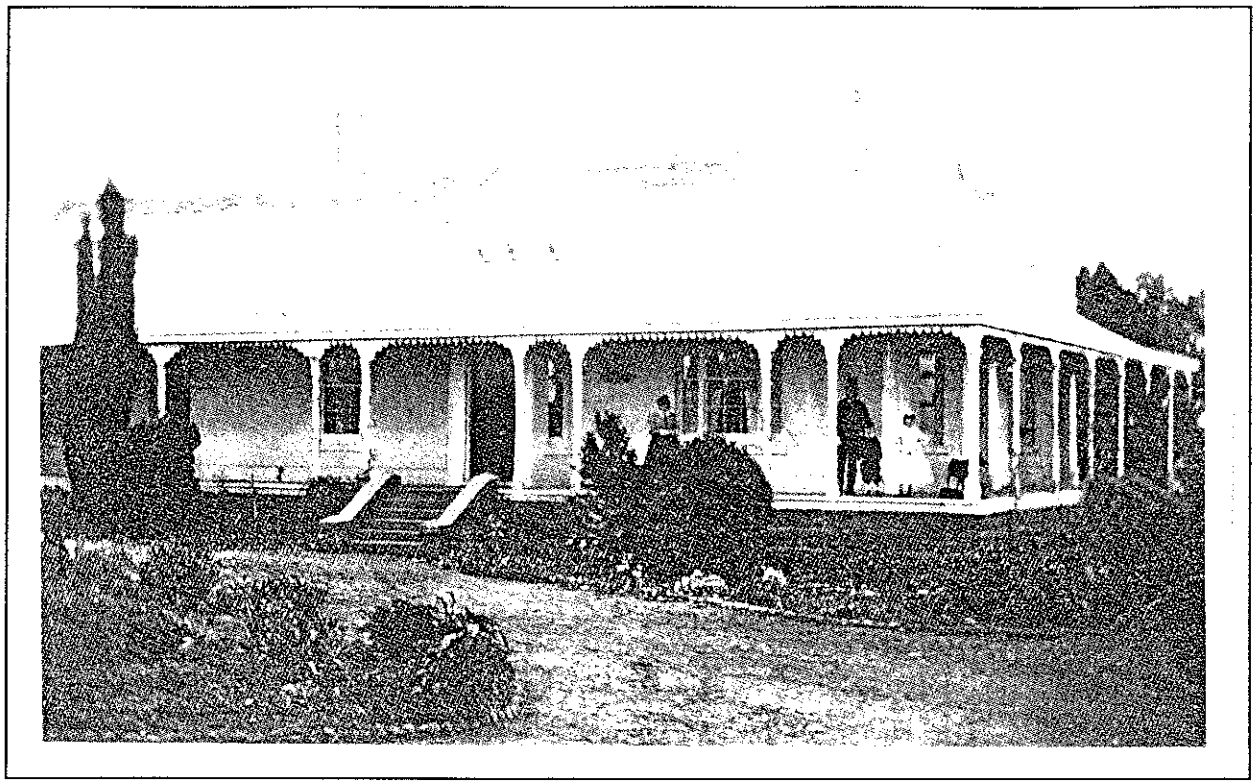

Plate 40. Raleigh's Homestead .[332]

Raleigh's Homestead **c.1847** **d. pre 1892**

Joseph Raleigh's homestead was located on the west side of a hill in the horseshoe bend of the Maribyrnong River, about half a mile from the study area, on the present site of the Commonwealth Engineering Development Establishment, west of Randall Street and north of Raleigh Road.

A traveller passing through in 1852 crossed the punt over the Saltwater River and noted:

> *Near here is a station belonging to Mr Ryleigh, a happy specimen of a squatter's home - everything being managed in a superior manner. The house itself is on a rise and surrounded by an extensive garden, vinery and orchard, all well-stocked and kept; some beautifully enclosed paddocks reach to the Creek and give an English park-like appearance to the whole.*[333]

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[332] From *C.B. Fisher, Pastroalist, Studmaster and Sportsman*, La Trobe Collection, State Library of Victoria.

[333] Mrs Charles Clacy, *A Lady's Visit to the Gold Diggings of Australia*, re-printed London, 1963, p.34.

The site is now part of land occupied by the Commonwealth Engineering Development Establishment (formerly Explosives Factory Maribyrnong), and the general location of the homestead can be recognised by a stand of trees, about 300 metres north of Raleigh Road and 400 metres west of Randall Street.

One account of the Raleigh property at Maribyrnong comes from Thomas Prendergast, born in 1849 on Raleigh's estate, where his father was Raleigh's teamster and his mother the gatehouse keeper. He told his story to the *Footscray Advertiser* in 1909, when he would have been 60 years old.[333] He described the building of Raleigh's mansion as being in 1844 and remembered the names of the builder and the chief stone mason. His father carted the stone, which was quarried and cut on the estate. According to Prendergast, the castle (see below) was built 'a little later'. Parts of his story do not fit in with the contemporary evidence, for example, when he says Raleigh had a sheep and cattle run that extended from the Saltwater River to the Werribee. Similarly, his dates may not be quite accurate.

The mansion and estate north of Raleigh Road were sold to Hurtle Fisher about 1862. Years later, William and Joseph returned to Melbourne and established the firm of Raleigh Aitken & Co., stock & station agents. They did business at the Newmarket saleyards until about 1902 and were remembered later as 'Willie' and 'Jo', 'of pastoral upbringing and closely related to many big pastoralists and squatters'.[334]

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333 'Haunted castle was popular rendezvous', in *Footscray's First Hundred Years*, Footscray, 1959. His account of building activity on Raleigh's estate may well apply to the years 1848-49. According to the school teacher Thomas Flynn, writing in 1906, the mansion was not finished until years after Raleigh's death, at a cost of £15,000.

334 Harry H.Peck, *Memoirs of a Stockman*, Melbourne 1942, p.30

Raleigh's Castle / Malakoff's Castle **c.1848-55** **d. c.1910-30**

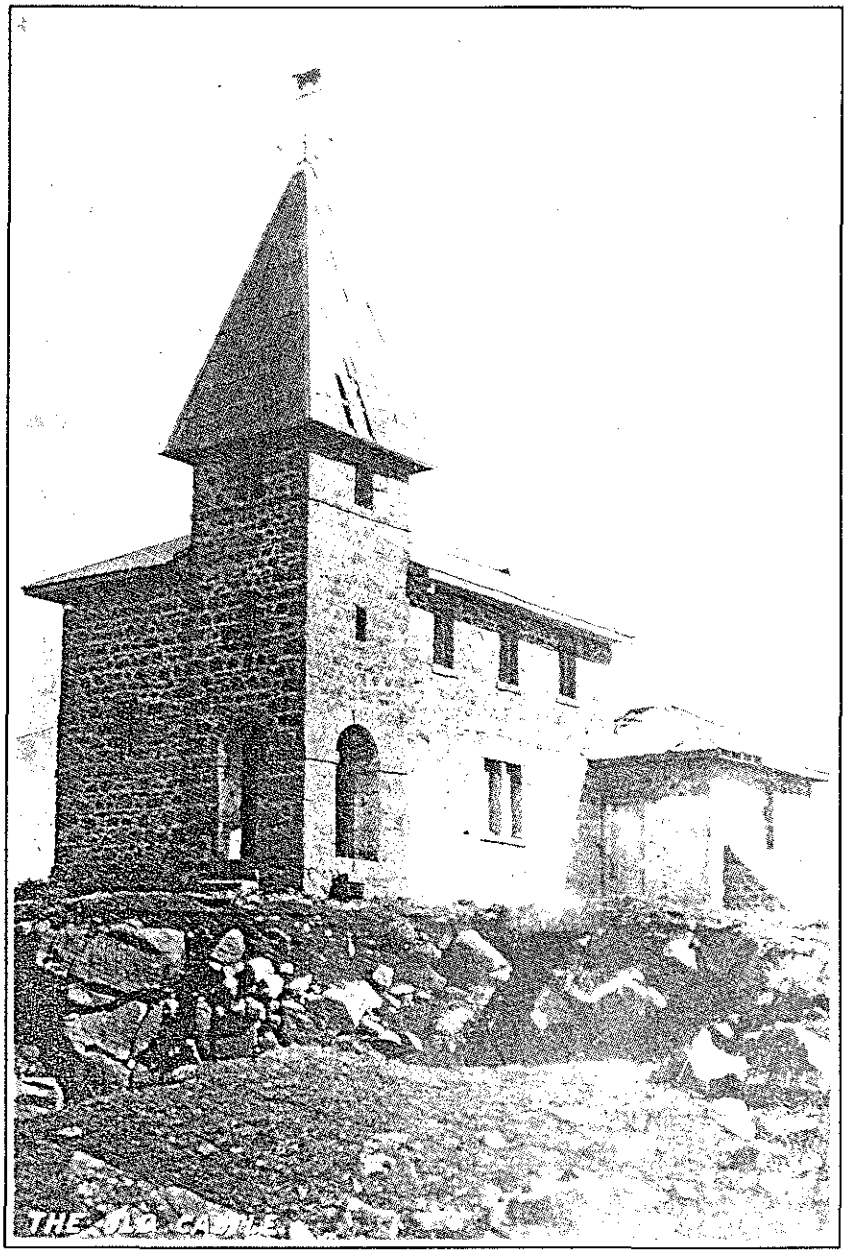

Plate 41 The Old Castle, Maribyrnong.[336]

History

Raleigh's Castle was for many years a prominent landmark in the area. It is still remembered by older local residents who recall playing in the ruins as children. The tower, surmounted by a brass weather vane in the shape of a sheep, could be seen for miles. The exact date of construction is not known, but could have been about 1848-49. It later became known as 'Raleigh's castle'. According to Henderson, the building was for the accommodation of Raleigh's shepherds and other employees. It is likely that these were the men who worked at Raleigh's boiling down establishment, immediately below, by the river. There is a later story that the weather vane reflected the sun and guided shepherds bringing flocks to the works. A passing traveller in 1852 apparently did not see the works, perhaps because of the bend in the

336 From a postcard printed in 1906, photographic copy held by Sunshine & District Historical Society.

river. If she did see it, she thought it was 'a little hamlet'. However, she described the castle as 'a Swiss church' .[337].

The 'Greeves' drawing has the title 'Malakoff's castle on the Saltwater River' showing both the castle is on the hill and the boiling down works on the river below.[338] The name 'Malakoff' dates the illustration to the time of the famous French siege of the great Malakov fortress during the Crimean War which culminated in a French Victory on 9 September 1855.[339]

There are many legends surrounding the story of the 'castle' above the works, but again no contemporary description has been discovered to date. One account explains that Raleigh tried to keep his workers away from the temptations of the metropolis by providing a residence, which also served as a church on occasions.[340] Another later account provides what is claimed to be the authentic story:

> *In the days when the early squatters were forced to boil down their flocks for tallow for want of grass or a market for their live beast, the old "boiling down works" (now Hume's cement works) was established. Essendon was the nearest centre of civilisation - an hotel, to wit - and the workers at the boiling down, going there on Saturdays sometimes did not return until well into the next week, to the detriment of their own well-being and the profit of the employer's business. The latter remonstrated, and a humorist of that bygone day said that he and his mate had to go to Essendon to church, and temptation befell them on the way - and after. The pioneer then decided to do away with that excuse by building a church, and the old castle - part church, part residence, part fortress - was the result. As weather-vane to the spire was a gilded sheep - plainly to be seen in the Jubilee book - which, with the sun shining on it, acted as a guiding mark to the shepherds driving their sheep over the then open bush on their way to the "boiling down". It stood clear above the horizon from whichever direction the castle was approached. Later, the Crimean war led to the name Malakoff being added to the fort-like structure, and , as with most ruins, the reputation of being "haunted" attached to the old shell.*[341]

Raleigh's Castle was renovated for accommodation of single and casual workers for the Melbourne Meat Preserving Co. A licence was obtained and in 1871 the building was listed in the Braybrook Shire ratebooks as the 'Castle Hotel'. The 1886 sales notice of the MMPC property described 'a bluestone boarding house (for men temporarily employed).' The spire blew down in a gale in October 1916.

In the photo of c.1920, the ruins of the 'castle' appear in the background, but in later photos it has disappeared. Harry Pearce recalled the spiral of big stone steps going up the tower and the slits in the walls to view out. He went away at the end of 1920 and later found that the ruins disappeared when Walter Hume went overseas to England, leaving the factory manager, A.J. Webberley, in charge. Webberley ran short of metal and put the stone from the castle ruins through the crusher. When Hume returned he was very angry at the loss of the 'castle'.

The site is probably located on numbers 15-16 Belvedere Close, but no evidence of the building remains has been reported. It appears from comparison of the nineteenth century illustrations and 1930 plans, that following the demolition of the castle the area around it was excavated probably down to about 3-5 metres which may have destroyed any trace of the building unless a cellar or deep foundations survive beneath the modern houses or in their back yards.

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337 Mrs Charles Clacy, *A Lady's Visit to the Gold Diggings of Australia*, re-printed London, 1963, p.34.

338 The illustration is in the La Trobe Collection, State Library of Victoria. It was used for the cover of the book by E.Popp, *Glimpses of Early Sunshine*, Melbourne 1979.

339 R.W.Seton-Watson, *Britain in Europe 1789-1914*, Cambridge, 1945, p.341.

340 *Herald*, 31 July 1911.

341 *Advertiser*, 28 October 1916.

Water tanks **c1848-55** **d. c1910-30**

At least three in-ground water tanks or cisterns are depicted in plans and photographs of the general area. One was circular with a square fenced enclosure, near the top of the hill about 100 metres south of the castle. During the construction of foundations for a new house at lot 30 Belvedere Close this tank was excavated. It was filled with concrete rubble waste from the pipe factory, and the structure of the tank was clearly evident. The walls and floor were of bluestone with a cement render inside. It is understood a foundation pillar was constructed in the tank to support the house, and the remainder was backfilled.

There was storage accommodation for 100,000 gallons of water which would have been kept in the bluestone-lined cisterns shown on a plan of 1908. The tops of cisterns also appear in the illustrations of 1868, published in the *Illustrated Australian Sketcher* of 5 October 1868.

Warr's Homestead **c.1852** **d. c.1940**

History

Warr's Homestead was located on the north slope of the escarpment above the meatworks. A "house on the hill" was noted as early as 1852, which was a small timber structure. This was occupied by the factory manager at one stage. Mrs Charles Clacy described the house on the hill as ' a pretty little parsonage, whitewashed, with slate roof and green painted window frames'.[342] It is possible that the 'parsonage' was the residence of the overseer at the boiling-down works. It was situated just above the present Hillside Crescent and appears on an etching of 1866.[343] It was later greatly enlarged, or completely rebuilt in the 1870s as shown in illustrations of the period and later plans and was referred to in the 1886 sales notice of the MMPC land and buildings as 'a compact manager's residence, containing three sitting rooms, six bedrooms, washhouse, dairy etc.'

Thomas Warr, merchant, previously a cartage contractor, was the purchaser of the 190 acres of land put up for sale by the Melbourne Meat Preserving Company in 1886. He came to reside in Maribyrnong and apparently lived in the house which had once been the home of Samuel Sextus Ritchie and his family. Warr was certainly not interested in the site as a meat cannery. It is more likely that he was attracted by the abundant supply of bluestone available west of the study area.

In the early years of Hume Bros. Cement Iron Company, W.R. Hume and his family were based in Adelaide. In 1913 he was overseas for some months. But by May 1915 it seems that he was living at Maribyrnong, in a large weatherboard house with bluestone laundry and dairy. This was probably the manager's residence in the days of the meat cannery and the home of Thomas Warr in the 1890s. Four Hume children are listed in correspondence relating to the establishment of new State School building at Maribyrnong.[344] One of them, Reg. Hume, has recalled attending the Maribyrnong school and playing down at the factory.[345] In about 1920, the family moved to Kew and by 1921 Reg. Clancy, foreman, was living in the house.[346]

The homestead was eventually demolished by the Hume Pipe Co. and the timbers were reused in construction of the top factory. Stabling and huts indicated on the 1908 plan on the north side of Hillside Crescent, may have been part of the original Warr's property.

The homestead was located between the present Belvedere Close and Hillside Crescent. Evidence of its location may still be seen in a cellar excavation, concrete slabs and stone foundations which survive behind the two storey house at the eastern end Grandview Avenue.

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342 Mrs Charles Clacy, *A Lady's Visit to the Gold Diggings of Australia*, re-printed London, 1963, p.34.

343 *Illustrated Australian News*, 27 November 1866.

344 Public Records Office of Victoria, VPRS 795, no 3736, E.G.Monk, 20 May 1915.

345 Reg, Hume in interview with Olwen Ford, 10 August 1995. See also ratebooks of the Shire of Braybrook, 1916-17, River Riding, no. 2764, entry for 'Hume Bros. Cement Iron Co., Adelaide', Section 21, portions 4-6, 'Homestead and Factory, 33 acres.'. Net annual value £185.

346 Ratebooks of the Shire of Braybrook, 1921-22, River Riding, no. 3947, entry for 'Hume Pipe Co.Ltd , 301, Flinders Lane '. Section 21, portions 4-6, 'Works' 26 acres. Net annual value £270. Walter H.R.Hume is rated separately for a dwelling and seven acres, with Reg.J. Clancy as occupier. Net annual value £60.

Cottages in Warr's Road **c1868 d. post 1935**

History

A row of twelve bluestone cottages were located on the east side of Warr's Road, just south of Raleigh Road, having been erected by the MMPC to house factory workers in a form of *Company village*. In 1868, the company forecast provision of worker housing. A year later, the company were implementing a scheme to build housing for some of their workers. Albert Purchas, the company's architect, was supervising the scheme and called for tenders for erection of 12 stone cottages in November 1869.[346] They are of considerable interest as an early example of a company housing scheme. Employees of the factory were living in the cottages from 1870 onwards.[347]

The cottages referred to in the 1886 sales notice as 'twelve bluestone cottages, six comprising three rooms, six comprising four rooms' and are depicted in the 1908 plan as "Stone Terrace", about 150 metres long but quite narrow. It is divided into two sections by a passage through the middle, and fenced front an back yards are shown.

Quarries and crushers **various dates**

A range of quarrying activities have been carried out on the opposite side of Van Ness Avenue resulting in the almost total alteration of the ground surfaces. Plans from the 1930s show tramways, huts, crushing plants, and roadways in addition to the quarry holes themselves. In some photographs, it appears that Humes operated a portable crushing plant in the vicinity of Raleigh's Castle. the only surviving evidence of the former landscape is in the form of a excavated area on the west side of Van Ness Avenue that appears to have housed sheds in the 1920s.

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346 *Argus*, 24 November 1869, p.3. See also *Argus*, 26 February 1870, p.7; *Age*, 24 September 1870, p.4.

347 See O.Ford, 'Voices from below: Family, School and Community on the Braybrook Plains, 1854-1892', M.Ed. thesis, Uiversity of Melbourne, 1993, pp. 36-55. This includes a section on some of the workers at the factory and their families.

3.5 Significance of sites outside the study area

While the above sites are outside the study area of the present Conservation Plan, they may assist in the understanding, interpretation and assessment of the significance of the study area through their associations. None of these external sites survive intact, but they may have archaeological potential. The close links between sites such as the castle, Warr's homestead Raleigh's homestead, the school, workers cottages, water tanks and quarries - and the history of Pipemakers Park, suggest that these sites should be monitored and further investigated when the opportunity arrises. The sites may also be of individual archaeological significance, and so recommendations have been made below for recording on the Heritage Victoria, Heritage Inventory.

Table 5. Related archaeological sites outside the study area.

Building/feature	**Dates**	**Potential for survival of fabric**	**Nature of surviving fabric**	**proven (potential) level of significance**
Raleigh's Homestead	c.1847 - 1892	proven	footings and garden remains	primary
Raleigh's Castle / Malakoff's Castle	c.1848-55 - c.1910-30	moderate		(primary)
Water tanks	c.1848-55 - c.1910-30	one proven	intact tank filled with rubble	primary
Warr's Homestead	c.1852 - c.1940	proven	footings, garden remnants, cellar excavation domestic rubbish	primary
Cottages in Warr's Road	c1868 - post 1935	high		(primary)
Quarries and crushers	various dates	low	filled	(contributory)

3.6 Existing conditions drawings

4.0 Assessment of significance

4.1 Statement of significance for the site as a whole

The surviving buildings, structures and features in Pipemakers Park are of historical, architectural, technological and social significance at a national level for their continuous association with the industrial and commercial development of Victoria and Australia from the 1840s down to the 1970s.

The site represents four, or possibly five, historic industries of very great significance to the history of Victoria and Australia. They include one of the first large scale processing works in the colony (Raleigh's Boiling Down Works - 1848-c. 1853); an association with the company which built the first railway locomotive in Australia (Robertson, Martin and Smith's Victoria Iron Works - 1854-55); the largest and most successful of the meat-preserving and canning works in Victoria, (Melbourne Meat Preserving Co. - 1868-86); the first commercial frozen meat export factory in Australia (Australian Frozen Meat Export Company - 1880-82); and one of the first two factories making centrifugally-spun reinforced-concrete pipes in Australia (by the Hume Pipe Company / Humes Ltd. - 1912-1978).

Three of these enterprises (the Melbourne Meat Preserving Company, the Australian Frozen Meat Export Company and the Hume Pipe Company) were important in a world context. The Australian Meat Preserving Company was Australia's leading meat cannery and the largest of its type in the world.[349] The site is also of importance for the association with significant exports of both Australian-made products and Australian-born technologies.

The complex of bluestone buildings is of architectural significance as an outstanding example of a nineteenth century factory complex, executed to a high standard in the local basalt stone and demonstrating local building skills. It is one of the largest mid to late nineteenth century industrial complexes surviving in Victoria, and one of only a handful of large bluestone factories. It is also significant in the history of the introduction of fire-proof construction technology, while the location demonstrates the important locational factors of sea transport via navigable rivers, availability of local building material (bluestone) and access to livestock for processing.

The site is historically significant for its association with important figures: S.S. Ritchie and Walter Hume, and to a lesser extent Joseph Raleigh, Albert Purchas, John Pigden, and William Anderson. The site demonstrates the business acumen, entrepreneurial skill and different philosophy towards manufacturing of Ritchie and Hume. This is especially seen in the contrast between the monumental bluestone buildings erected by Ritchie in the nineteenth century and the more prosaic additions of the twentieth century for which Hume was responsible.

The place demonstrates the pioneering technology and skills of Australian manufacturer, S.S. Ritchie, and the designer and builder of the 1868 works and possibly later additions, Albert Purchas and John Pigden. The Melbourne Meat Preserving Company, established in 1868, was the first such company in Australia and was an innovator in the fields of food preserving, transportation technology, material handling and refrigeration. The firm's expertise was used by many other firms such as the Sydney Meat Preserving Company and Flemington Meat Preserving Company, established by the Melbourne Meat Preserving Company's chief preserver, William Anderson.

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[349] Personal communication Prof. Emory Kemp, 18 September 1996, confirms that the American meat canning industry did not commence exporting on a large scale until the mid 1870s.

The site is also significant as the location of the first successful export freezing company in Australia - the Australian Frozen Meat Export Company, established in 1880-82. This firm became the model for many other such enterprises, including the first frozen meat industry in New Zealand.

The site is also significant for its association as one of the earliest and principal works of the Hume Pipe Co. which in the words of G.D. Snooks, 'was the only Australian firm of the pre-World War II period to pioneer a new technology (for the manufacture of concrete and steel pipes) and to export its innovations throughout the world ... [in the form of patent rights] as ... but also included the export of specialised machinery which was produced in the firm's own engineering workshops. Therefore Humes exported capital and technology at a time when other Australian firms were doing the reverse'.[350]

The activities of the Humes firm contributed to many large scale public works projects, not the least of which was the provision of pipes for the construction of water, sewerage and drainage facilities at a considerable reduction in the cost to society. The Maribyrnong factory was also an important training ground for Humes personnel and the site of much of the experimental work of the company.

[350] G.D. Snooks, 'Innovation and the Growth of the Firm: Humes Enterprises 1910-40' in *Australian Economic History Review*, No.13, 1973, pp. 16-17.

4.2 Statements of significance for individual buildings

These statements of significance are reproduced from the relevant sections in the inventory and description in section 3 above.

Building 1

Building 1 is of primary significance as an important and distinctive element of the Melbourne Meat Preserving Co. reflecting a period of prosperity of the firm when this was the largest and most important meat preserving factory at the time. The building displays evidence of the physical expansion of the MMPC during the early 1870s. It is of architectural significance in respect to the adoption of fireproof construction methods, such as the use of cast iron columns, wrought iron beams and concrete jack-arches. The siting of the building reflects the relationship between the factory operation and river transport with the original wharf being immediately adjacent to the building. As the building incorporates small part of a bluestone building dating to before 1858, it is important as containing some of the earliest fabric on the site. The raised floor of the building shows the adaptation to the flood-prone situation by the Humes company when they altered the building for their own purposes.

Former Butcher/tinshop 1-2

The surviving remains of the former butcher/tinshop are of contributory significance because they demonstrate evidence of the pre 1858 structures on the site, possibly part of Raleigh's boiling-down works. The site also has archaeological significance in that it retains structural details and archaeological evidence which may provide further information on the nature of processes and operation of the industries on the site.

Building 2

Building 2 is of primary significance as the largest and most intact structure relating to the Melbourne Meat Preserving Co. and directly demonstrates the philosophy of that firm at the peak of its operation when this was the largest and most important meat preserving factory at the time. The open plan of the building reflects the manufacturing and management methods of the time in the need to allow for supervision of the whole process, and flexibility in layout and transfer of product between stages in the process.

Building 2 is of historical significance for its association with a number of nineteenth century meat and by product industries. This includes remnants of Raleigh's boiling down works of c1847-8, which are possibly the oldest physical remains of any industrial enterprise in Victoria. The building is of architectural significance as a very large utilitarian and purpose-built industrial building. The design of the building, such as the use of bluestone and brick for all walls with wrought and cast iron roof trusses and purlins and cast iron window frames, demonstrate the adoption of the then-standard fireproof building technology as a consequence of the 1873 fire. The roof trusses are an unusual and sophisticated design incorporating an apparently patent system of cast iron connectors with wrought iron tension and compression members.

The ***workshop*** *is of primary significance for its association with the engineering activities of both the Melbourne Meat Preserving Co. and the Hume Pipe Co. and so can be linked to the important technological developments in pipe manufacture of that company.*

The ***Stables*** *are of primary significance as an integral part of the nineteenth century meatworks complex and as evidence of the use of horses for transport during the first years of the Humes*

operations on the site and possibly also the Melbourne Meat Preserving Company period. The structure also reflects the ancillary activities such as blacksmithing, during the period of the Melbourne Meat Preserving Company, and has archaeological significance.

Chimney

The remains of the chimney are of primary significance as a key part of the factory alterations carried out by the Melbourne Meat Preserving Co. in 1868. Although a fragment, the bluestone and brick structure is of architectural significance in the way it demonstrates the refined design and sophisticated construction techniques applied to purpose-built industrial structures in the mid nineteenth century. The chimney is also important for its ability to demonstrate the use of steam generation for motive power and heating required by the meat preserving works.

Building 3

Building 3 is of primary significance as a key part of the additions of the Melbourne Meat Preserving Company. It demonstrates the expansion of the site when the MMPC took over the former boiling down works and gives some indication of the specialist operations which were introduced as part of the integrated meat and by-products process which the Melbourne Meat Preserving Company developed. Building 3 is also apparently the oldest relatively complete building on the site comparing with Building 1 - 1872 and Building 2 - 1874. The later raised-roof section demonstrates the adaptation of the building by Humes as their fitter's and turner's workshop. It is or archaeological significance in that surviving elements such as ovens, flues, etc, have potential for further investigation.

Building 7

Building 7 is of primary significance as the only substantial production building remaining from the Humes period and the only remaining building which can demonstrate the pipe manufacturing process. It is significant as a representative example of the style of purpose-built structure erected by Humes, and many other firms during and immediately after World War II. In its use of recycled materials it represents a period when building materials were in short supply. The subsequent alterations to the building also demonstrate the nature and business practice of Humes management in the way the company undertook the minimum capital investment in building stock compared with its investment in and success in technological developments.

Pipe Racks

The pipe racks are of contributory significance in their potential for providing an understanding of the production processes in concrete pipe manufacture and insight to the once extensive storage and curing areas required by the works.

Building 8 Substation

The substation is of primary significance as an integral part of the activities on the site of the Hume Pipe Company and the oldest surviving building erected by that company on the site. It is also important for its ability to demonstrate the introduction of mains electricity as a motive power for the manufacturing processes throughout the site in the 1920s during a period of expansion by Humes.

Workers Garden

The workers garden is of contributory significance as a demonstration of the role of the workers, and particularly migrant workers, in the establishment and maintenance of the landscape and facilities on the factory site during the Humes Period.

Sand chutes - Building 9

The steel sand chutes are of contributory significance as they assist in demonstrating the operation of the Humes factory in its later period of operation - in particular the delivery and storage of raw materials to the site.

Bluestone retaining wall (former crusher site east of pipe racks)

The bluestone retaining wall is of contributory significance as an unusual landscape feature demonstrating evidence of the major topographic changes which have occurred on the site as a result of the development of the Humes factory. The wall of spalls (hand broken blocks of bluestone of a size that can be lifted by one man and put through the primary crushers) is also a good example of the materials and past processes used for concrete manufacture at the pipe works.

Building 6 foundations

The remnants of the bottom factory are of contributory significance as evidence of the extent of the a major section of the Humes factory in the first half of this century. This 8 foot pipe factory was constructed and used during the most innovative and significant stage of the Humes firm - 1920s to 1930s. Although obscured by recent landscaping works, the remnants of the bottom factory foundations still reveal evidence of the first stage of expansion on the site by the Hume Pipe Co. and surviving features such as the retaining wall, concrete chutes and machinery bases assist in the interpretation of the pipe making process on the site. Like the top factory, the site demonstrates the use of the topography to assist in moving materials by gravity during the manufacturing process.

Other features

A number of other features contribute to the understanding of the operation and development of the site. These include the low bluestone retaining wall along the east edge pipe racks, terraced areas and buried archaeological deposits. These items are important for their ability to show the context in which the various industries operated and in the case of archaeological evidence, the potential for new information to be revealed through proper investigation.

4.3 Other statements of significance

There are several existing statements of significance for the historic buildings in Pipemakers Park. These have been included in full in the Appendices. The most recent, and most cohesive, is that of the Register of the National Estate, which indicates all surviving meatworks and Humes period structures are of significance, and includes an area of designation which encompasses sites of potential archaeological significance and associated landscape. The National Estate Statement of Significance identifies the several industrial ventures as contributory: namely Raleigh's Boiling downs Works, Robertson, Martin & Smith's foundry, Melbourne Meat Preserving Co., Australian Frozen Meat Export Co. and Hume Pipe Co. / Humes Ltd.

The AHC statement also identifies aspects of the site's development which contribute to its significance including the pioneering of technological processes (boiling down, meat preserving, concrete pipe manufacture) its industrial architecture and associations with individual historic figures (Joseph Raleigh, S.S. Ritchie, Albert Purchas, John Pigden, William Anderson and Walter Hume).

The Victorian Heritage Register indicates that the former Hume Pipe Factory was recorded on the Government Buildings Register, but it does not appear to have a statement of significance. The registration identifies only the nineteenth century buildings as of primary significance, that is, the bluestone buildings, and in the case of Building 3, only the part of the building of nineteenth century origin including the bluestone walls on the west side and part of the roof structure. This is despite the fact that correspondence from the Heritage Branch to the MMBW suggested that the Humes period was of equal significance.

The National Trust citation is brief, focussing equally on the importance of the Melbourne Meat Preserving Co. and Hume Pipe Co. It also stresses the substantially intact nature of the surviving buildings and the adaptation of English industrial design in the open plan layout, as being contributory to the site's significance.

4.4 Comparative analysis.

Bluestone industrial buildings

Although once a standard building type in Melbourne, surviving bluestone industrial buildings are only poorly represented in the urban environment. Those which survive are generally associated with continuing industry in inner suburban areas. The bluestone wool stores and warehouses centred on King Street Melbourne, are not truly comparable, as they demonstrate the commercial and public face of business. Nor are the bluestone railway buildings or woolsheds on Western District grazing properties, which are relatively common.

Of more relevance are bluestone stores in suburban and regional areas (for example, the Melville grain stores in Brunswick, Pratt's warehouse in Ballarat), and bluestone factories such as the remains of the former Carlton Brewery in Bouverie St., a former smelting works in Madden Grove, Burnley, and the Barwon Paper Mill, Geelong. Like the Pipemakers Park buildings, these factories exhibit characteristics unique to their particular industrial function. The consistent elements are the use of coursed rubble bluestone with some detailed tooling to quoins and decorative elements, and the use of brick for some elements like window and door openings or fireplaces.

A number of bluestone factories are either only partially preserved, or contain parts of bluestone construction in a complex predominantly of other material. In the first category are buildings such as the Apollo Candle Works in Kensington Road, Flemington, the Yarraville Woollen Mills and Alfred Woollen Mills, Williamstown, all of which contain remnants of bluestone walls and timber roof structures, but within much later alterations and additions.

Other meat and by-product works

The Melbourne Meat Preserving Company was one of several such firms established in Victoria, and other colonies between about 1868 and 1883. Among the other 15 Victorian companies were the Australian Meat Preserving Co. Ltd., the Victoria Meat Preserving Co. Ltd., Port Phillip Meat Preserving Co. Ltd., the Flemington Meat Preserving Co. Ltd., the Australia Felix Meat Preserving Co. Ltd. and the United Meat Preserving Co. Ltd. None of these factories are known to survive. As well as meat preservers, there have been a variety of other meat and by product industries established in Melbourne during this same period. The Apollo Candle Works has already been mentioned. Of the surviving works, Henderson's Bacon Curing Works in Footscray (now the Footscray Community Arts Centre) has a small bluestone processing section with part cellar surviving attached to the managers house. Although a much smaller space, this exhibits some of the characteristics of the Melbourne Meat Preserving Co. buildings in terms of design and materials and is roughly contemporary.

A number of the later integrated export meat works such as Angliss, Newport Freezers and the City Abattoirs, had comparable complex sites, but they have nearly all been demolished. Of the Melbourne municipal abattoirs, only the South Melbourne works in Lorimer St. is relatively intact. Along with Mowling's Soap and Candle Works in Whitehall St. Footscray, it provides a useful comparison with the MMPC, in the arrangement of interconnected but separate buildings intended for different stages in a production process. This is demonstrative of the early adoption of incipient production line processes in the meat industry in a traditional manufacturing climate and precedes true production line manufacturing where the continuous processes occur within a single factory space.

An interesting historical comparison can be found at Totara Estate, in New Zealand, which had a meat freezing enterprise established in the early 1880s directly based on the Australian Frozen Meat Export Company's Maribyrnong operation.

Albert Purchas

Albert Purchas is known to have been employed by the Melbourne Meat Preserving Company to undertake alterations and extensions to the factory in 1868 and also possibly following the 1873 fire. Purchas was briefly a contract surveyor under Robert Hoddle in the 1850s and then a relatively prolific Melbourne architect spanning the period 1853 to 1891. He is credited with 166 entries in the Melbourne University Architect's Index. The surviving bluestone structures in Pipemakers Park are a significant example of the work of Purchas, particularly demonstrating his approach to utilitarian design for industrial structure.

Albert Purchas was practising as an architect and civil engineer in Melbourne for almost half a century.[351] His work included many commercial buildings, such as warehouses, offices, banks and shops in the City; barristers' chambers; houses; churches; hotels; and a number of commissions for the Booroondara Cemetery and Melbourne General Cemetery. He is also credited with the 1886 Reptile House and 1891 Elephant House at the Melbourne Zoological Gardens. A little over ten percent of his known work was of industrial buildings - such as warehouses and factories. But this included some of the more substantial industrial undertakings of the time, including the Victorian Meat Preserving Company's works in 1870,[352] the Australia Pyrites Company's works and chimney stack in 1877 and a large iron shed for the Apollo Candle Company at Footscray in 1882 as well as several other warehouses and woolstores.[353]

The association of Albert Purchas with the study area goes back as far as 1857-58, when the firm of Purchas and Swyer were involved in drawing the plans for sub-division and sale of a substantial section of the Raleighs' Maribyrnong estate. The firm were also the architects for the bluestone store erected in William Street for the firm of Raleigh, Dauglish, White and Co.[354] and for the erection of a house and offices near Toorak for H.W. Dauglish in 1858.[355]

Purchas was architect to the Melbourne Meat Preserving Company and his work included the renovation and extension of Raleigh's boiling down works for the 1868 factory and the terrace of twelve stone cottages for company employees, built in 1870. The 'wooden building with stone foundations at Maribyrnong', mentioned in a tender advertisement in1878, may have been for the Meat Preserving Company. He also designed buildings for the Australian Frozen Meat Export Company at Maribyrnong as well as several private and commercial buildings for the directors and shareholders of the meatworks such as woolstore for Hastings Cunningham houses for James White and William Sloan, and two houses for Walter Clark - 'Glenarra' near Bulla and his Brighton home.[356] Purchass owned shares in the Melbourne Meat Preserving Company and appears to have regularly attended company's half-yearly meetings. He is listed as the ratepayer for one of the company's houses in 1886-7.[357] It is highly likely that he was the architect who designed the 1872 tinsmiths' shop and the rebuilt 1874 central portion of the factory, though no written documentation has yet been found to confirm this.

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351 A. Sutherland, *Victoria and its Metropolis*, vol. 2, p. 529, item on A.Purchas; Granville Wilson and Peter Sands, *Building a City: 100 Years of Melbourne Architecture*, Oxford University Press, Melbourne, 1981, p. 192.

352 *Age*, 8 October 1870, p.3. This gives an account of the Victorian Meat Preserving Company's works at Stony Creek, near Footscray, 'on a favourable site secured from the Government ... on which plain but substantial buildings have been erected'. The architect for their new works was Albert Purchas.

353 Miles Lewis: Australian Architects' Index, microfiche copy in State Library of Victoria.

354 *Argus*, 25 November 1857

355 *Argus*, 25 November 1858

356 Miles Lewis: Australian Architects' Index, microfiche copy in State Library of Victoria.

357 Reports on company meetings, at which A.Purchas was present include *Age*, 5 April 1870, 3 June 1870, 8 April 1873; *Argus*, 7 October 1879, 6 April 1880.

In 1887-88 Albert Purchas was president of the Victorian Institute of Architects. He was architect to the Melbourne General Cemetery for many years. His son, Guyon Purchas also became a well-known Melbourne architect. Many of the buildings designed by Albert Purchas were of bluestone. Since 50% of Melbourne's bluestone buildings have been demolished, this means that a number of the city buildings designed by Purchas have disappeared, particularly his bluestone warehouses and structures such as the Savings Bank.

An entry on Albert Purchas in *Victoria and its Metropolis*, refers to some of the buildings designed by Purchas. These included the shops of Briscoe & Co. and George & George (Collins Street); the offices of the Mutual Insurance Co. and Northern Insurance Co.; the Bank of Australasia, Geelong, and the Savings Bank, Melbourne. Lloyd Taylor, in *Early and Later Melbourne Architects*, states that Purchas was responsible for Temple Court (Collins Street to Little Collins Street) and Christ Church, St.Kilda. Albert Purchas died in 1909.[357]

Other pipe factories

Hume Pipes erected many factories throughout Australia and overseas. The Maribyrnong factory was one of the earliest. Other factories established around the same time and which are still in existence include Bendigo and Geelong. These have a similar character in terms of open corrugated-iron sheds of rather makeshift construction. They also employ tramways both within the production areas, and in the past, to move finished products. Other works of competing companies such as Rocla and Monier, also appear similar in form and style. The much later former Monier Pipe Factory at Campbellfield was once a terracotta pipe works and retains a range of timber and iron buildings now converted to a market called Pipeworks.

[357] See Royal Victorian Institute of Architects' Journal, November 1909, p. 1142.and March 1910, p. 6.

5.0 Conservation Policy

5.1 Introduction

The conservation plan and policy has been developed on the basis of the cultural significance of the place and its individual buildings and elements. Its purpose is to provide direction and guidance for the future conservation, use and adaptation of the place, taking into account a number of factors which may affect the place including the requirements of the owner, Melbourne Parks and Waterways, and their policy for park development and management, feasible uses, physical condition and environmental and other factors. The plan is intended to form the basis for considering any future uses and any adaptation or alteration works that may be proposed and for assessing the possible impact on the cultural significance of the place of any future adaptations or alterations.

5.2 Review of conservation policy

It is recommended that Melbourne Parks and Waterways adopt the following conservation policies, and that they be periodically subject to review, normally at five year intervals, or if circumstances affecting the place alter in any way or if new data (e.g. from archaeological investigations) comes to light which may alter the understanding of the place or its significance.

5.3 General conservation policy

1. ***It is recommended that the surviving buildings, structures, landscape features and archaeological remains in Pipemakers Park which relate to both the nineteenth century industries and the Humes Pipe Works, are conserved in accordance with the Conservation Policy identified in this study.***

The conservation of the site as a whole should recognise all periods of significance, levels of significance and former uses and alterations to the various structures. The prime concern of conservation is the respect for the significant fabric. This extends to structural elements as well as surface finishes, fittings and architectural details. It also encompasses the setting, internal spaces and physical context, where these are contributory to the significance. The principles of conservation are defined in *The Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (The Burra Charter)* and are listed here:

Article 2 *The aim of conservation is to retain or recover the cultural significance of a place and must include provision for its security, its maintenance and its future.*

Article 3 *Conservation is based on a respect for the existing fabric and should involve the least possible physical intervention. It should not distort the evidence provided by the fabric.*

Article 4. *Conservation should make use of all the disciplines which can contribute to the study and safeguarding of a place.*

Article 5. *Conservation of a place should take into consideration all aspects of its Cultural significance without unwarranted emphasis on any one aspect at the expense of others.*

Article 6. *The conservation policy appropriate to a place must first be determined by an understanding of its cultural significance..*

Article 7. *The conservation policy will determine which uses are compatible.*

Article 8. *Conservation requires the maintenance of an appropriate visual setting: e.g. form, scale, colour, texture and materials. No new construction, demolition or modification which would adversely affect the setting should be allowed. Environmental intrusions which adversely affect appreciation or enjoyment of the place should be excluded.*

(The Burra Charter is included in full in the appendices to this report.)

2. ***It is recommended that the factors identified in the Statement of Significance as contributing to the significance of the place are considered in, and form the basis of, any future works.***

3. ***It is recommended that all future conservation and development works which affect elements of significance take into account the principles of the Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (The Burra Charter).***

4. ***It is recommended that the buildings and features identified as significant in the conservation plan are managed primarily for the conservation, interpretation and presentation to the general public as an historical industrial site in a parkland setting.***

5. ***It is recommended that compatible use of the buildings be a key consideration in future site development. Commercial activities and adaptive reuse need not be excluded from future use. Compatible uses can be developed for the buildings, structures and features identified as significant in this study, where they do not compromise or adversely affect the significance of the site, or where they may enhance the character and significance of the place.***

Complementary uses, such as refreshment facilities (e.g. kiosk, café), recreation facilities (e.g. boat hire) or retailing (e.g. book shop, market) may all be suitable uses provided they complement the primary use and their facilities are provided in accordance with items 3 and 4 above. Spaces within the significant buildings may be adapted for compatible uses within the conservation guidelines. Any works required to adapt buildings for compatible uses should have minimum impact on culturally significant fabric, should be substantially reversible in case the need to remove them arise, and should not detract from the cultural significance of the buildings or site as a whole. Use of the buildings should also be compatible with the management of the adjacent parts of Pipemakers Park for recreation, conservation and flora and fauna habitat.

5.4 Specific conservation policy

Building 1

1. ***It is recommended that Building 1 is conserved in such a way that all phases of its occupation are able to be conserved and interpreted.***

The surviving structure primarily relates to the Melbourne Meat Preserving Company period with some evidence of alteration by the Hume Pipe Co. such as the installation of racking and the petrol bowser. The demolition of the upper floor and the blocking up of windows are not in themselves significant as expressions of former use.

2. ***Re-utilisation of Building 1 for compatible uses is appropriate, but only where such uses or required adaptive modifications do not diminish the integrity of its significant aspects. These particularly include the concrete vaulted ceiling, cast iron columns and wrought iron beams at the north end, evidence of the window openings, the evidence of changes in floor levels, and the existing external plan of the building.***

3. ***It is recommended that any restoration and reconstruction work is directed to the reinstatement of the building elements to their original (Melbourne Meat Preserving Company) form and that it is only undertaken to ensure the stability and future viability of the structure. The basis for such works would be the physical evidence in preference to photographic or documentary evidence.***

Reconstruction based on photographic evidence should only be undertaken where the reconstruction would assist in interpreting the surviving structure.

4. ***It is recommended that any adapted use does not preclude the ability to interpret the significant fabric of the building.***

5. ***If additions are required to enable a viable future use of the building, it is recommended that this be achieved by the reconstruction of the top floor to its 1870s external appearance.***

This would provide an additional top floor space suitable for a wider range of uses which may give the building a more viable option for re-use, while enhancing the conservation and interpretation potential of the bottom level. Such work should only be undertaken where it is part of an adopted management and development plan for the site in accordance with this policy.

Building 2

1. ***It is recommended that Building 2 is conserved in such a way that all phases of its occupation are able to be interpreted and that the architectural and historical significance of the building as detailed in this Conservation Plan and Policy is taken into account.***

2. ***Re-utilisation of Building 2 for compatible uses is appropriate, but only where such uses or required adaptive modifications do not diminish the integrity of its significant aspects. These particularly include the existing internal building volumes, and open roof truss systems. Restoration and reconstruction works should be undertaken to ensure the stability and future viability of the structure. The basis for such works should be the physical evidence in preference to photographic or documentary evidence.***

3. ***It is recommended that any adaptive re-use does not preclude the ability to interpret the significant fabric of the building.***

Consideration could be given to reconstructing the entrances to Building 2, according to the original 1874 design as indicated in photographic and physical evidence along with reinstatement of original window and door openings according to photographic, historic and physical evidence. Evidence for the original condition of the upper southern entrance is lacking, so reconstruction should not be undertaken unless further evidence can be found.

4. ***It is recommended that future use of Building 2 is in accordance with this conservation policy, that such use does not adversely affect significant fabric, that the building is available for access and interpretation to the general public and any alterations continue to permit flexible multiple-purpose uses such as interpretation and community programs.***

Building 3

1. ***It is recommended that the significant fabric of Building 3 is conserved and interpreted in its currently refurbished form. The present open plan adapted reuse of the building is compatible with the cultural significance of the building.***

2. ***It is recommended that any future development work, including restoration or reconstruction works is designed so as not to diminish the integrity of the remaining significant aspects, in particular the bluestone and brick perimeter walls, the oven and flue structures on the west wall and the original timber columns and roof structure. The basis for any restoration or reconstruction works should be the physical evidence in preference to photographic or documentary evidence.***

Chimney base

1. ***It is recommended that the chimney base is conserved and interpreted for its historical and architectural significance.***

2. ***Restoration and reconstruction works is required to ensure the stability and future viability of the structure. The basis for such works should be the physical evidence in preference to photographic or documentary evidence.***

Restoration should be confined to repointing of mortar joints in compatible lime mortar, resetting of bricks and stones that have been displaced from the top courses and hardening-off of upper surfaces.

Building 7

1. ***It is recommended that Building 7 is conserved and interpreted as the last remaining example of a Hume pipe production building on the site.***

2. ***It is recommended that a viable compatible use is actively sought to enhance the long-term survival of the building.***

Reuse of Building 7 could utilise the repaired canopy and structure and enable the retention of key significant elements including the surviving steam chambers, tramways, pressure tester and machinery bases.

3. ***Building 7 is in immediate need of structural work as a preliminary measure, in order to make it safe for public access and allow for future viable reuse to be developed.***

4. ***It is recommended that ,where possible, the interpretation of the pipe making production process is incorporated within any adaptive use of the building.***

Workers Garden

1. ***It is recommended that the surviving elements of the Humes garden are conserved and repaired. Restoration could be considered with replanting of similar species to those in place during the final years of the Humes occupation, i.e. 1960s -70s.***

5.5 Archaeological investigations

1. *The areas of archaeological potential should be protected from any damage or destruction in order to protect the archaeological deposits.*

2. *A program of archaeological investigation should be conducted with a two-fold purpose:*

   1) to investigate areas of archaeological sensitivity prior to any works including alteration, restoration, repair or reconstruction, or underground service trenches, to determine the nature of original fabric and

   2) to answer research questions regarding the history and operation of the site and in particular, the location and use of demolished structures.

5.6 Interpretation

1. *A review and revision of the present interpretation plan of the site prepared by the Living Museum, should be undertaken in accordance with the policies set out for the site in this Conservation Plan. A program for interpretation of the site should then be prepared and undertaken in association with the conservation and management of the site.*

2. *Further historical investigation in relation to the Humes period should be undertaken to enhance interpretation of this aspect of the site's history.*

3. *Additional interpretation of the bottom factory (Building 6) should be undertaken, focussing on the remaining industrial artefacts and visible foundations.*

4. *As part of the refurbishment of Building 7, a program of interpretation should be developed, based on the existing Living Museum interpretation plan, and compatible with the program of structural repairs and adaptive use.*

5.7 Registration

1. *An application should be prepared to Heritage Victoria for amendment of the registration in relation to this site, to include the remains of Hume Pipe Company buildings e.g. Top Factory, sub-station , foundations of 'The History of the Land Discovery Trail'. At the same time the site should be proposed for transfer from the former Government Buildings Register to the present Victorian Heritage Register.*

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Alan Brain

Joe Bonnici

Johnny Caruso

Aldo Caposeina and Garth Knobloch

Reg. Hume

Harry Pearce

Research notes & photocopied archival material held by:-

Joan Carstairs

Bob Hayes: Grimes journal photocopy.

Personal communications

Patricia Elliot; K.T.H. Farrer; Ron Hodge; Reg. Hume; Prof. Ellory Kemp; Holt Pettit; Eric Treloar; Joy Vogt.

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Appendices

Appendix A: Burra Charter

BURRA CHARTER

PREAMBLE

Having regard to the International Charter for the Conservation and Restoration of Monuments and Sites (Venice 1966), and the Resolutions of 5th General Assembly of ICOMOS (Moscow 1978), the following Charter has been adopted by Australia ICOMOS.

DEFINITIONS

ARTICLE 1. For the purpose of this Charter:

1.1 *Place* means site, area, building or other work, group of buildings or other works together with pertinent contents and surroundings.

1.2 *Cultural significance* means aesthetic, historic, scientific or social value for past, present or future generations.

1.3 *Fabric* means all the physical material of the *place.*

1.4 *Conservation* means all the processes of looking after a *place* so as to retain its *cultural significance.* It includes *maintenance* and may according to circumstance include *preservation, restoration, reconstruction* and *adaption* and will be commonly a combination of more than one of these.

1.5 *Maintenance* means the continuous protective care of the *fabric,* contents and setting of a *place,* and is to be distinguished from repair. Repair involves *restoration* or *reconstruction* and it should be treated accordingly.

1.6 *Preservation* means maintaining the *fabric* of a *place* in its existing state and retarding deterioration.

1.7 *Restoration* means returning the EXISTING *fabric* of a *place* to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

Words in italics are defined in Article 1.

Explanatory Notes

These notes do not form part of the Charter and may be added to by Australia ICOMOS.

ARTICLE 1.1
Place includes structures, ruins, archaeological sites and areas.

ARTICLE 1.5
The distinctions referred to in Article 1.5, for example in relation to roof gutters, are:
maintenance – regular inspection and cleaning of gutters
repair involving restoration – returning of dislodged gutters to their place
repair involving reconstruction – replacing decayed gutters.

BURRA CHARTER

1.8 *Reconstruction* means returning a *place* as nearly as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the *fabric*. This is not to be confused with either re-creation or conjectural reconstruction which are outside the scope of this Charter.

1.9 *Adaptation* means modifying a *place* to suit proposed compatible uses.

1.10 *Compatible use* means a use which involves no change to the culturally significant fabric, changes which are substantially reversible, or changes which require a minimal impact.

CONSERVATION PRINCIPLES

ARTICLE 2. The aim of *conservation* is to retain or recover the *cultural significance* of a *place* and must include provision for its security, its *maintenance* and its future.

ARTICLE 3. *Conservation* is based on a respect for the existing *fabric* and should involve the least possible physical intervention. It should not distort the evidence provided by the *fabric*.

ARTICLE 4. *Conservation* should make use of all the disciplines which can contribute to the study and safeguarding of a *place*. Techniques employed should be traditional but in some circumstances they may be modern ones for which a firm scientific basis exists and which have been supported by a body of experience.

ARTICLE 5. *Conservation* of a *place* should take into consideration all aspects of its *cultural significance* without unwarranted emphasis on any one at the expense of others.

Words in italics are defined in Article 1.

Explanatory Notes

These notes do not form part of the Charter and may be added to by Australia ICOMOS.

ARTICLE 2
Conservation should not be undertaken unless adequate resources are available to ensure that the fabric is not left in a vulnerable state and that the cultural significance of the place is not impaired. However, it must be emphasised that the best conservation often involves the least work and can be inexpensive.

ARTICLE 3
The traces of additions, alterations and earlier treatments on the fabric of a place are evidence of its history and uses.
Conservation action should tend to assist rather than to impede their interpretation.

BURRA CHARTER

ARTICLE 6. The conservation policy appropriate to a *place* must first be determined by an understanding of its *cultural significance* and its physical condition.

ARTICLE 7. The conservation policy will determine which uses are compatible.

ARTICLE 8. *Conservation* requires the maintenance of an appropriate visual setting, e.g. form, scale, colour, texture and materials. No new construction, demolition or modification which would adversely affect the settings should be allowed. Environmental intrusions which adversely affect appreciation or enjoyment of the *place* should be excluded.

ARTICLE 9. A building or work should remain in its historical location. The moving of all or part of a building or work is unacceptable unless this is the sole means of ensuring its survival.

ARTICLE 10. The removal of contents which form part of the *cultural significance* of the *place* is unacceptable unless it is the sole means of ensuring their security and *preservation.* Such contents must be returned should changed circumstances make this practicable.

CONSERVATION PROCESSES

Preservation

ARTICLE 11. *Preservation* is appropriate where the existing state of the *fabric* itself constitutes evidence of specific *cultural significance,* or where insufficient evidence is available to allow other conservation processes to be carried out.

Words in italics are defined in Article 1.

Explanatory Notes

These notes do not form part of the Charter and may be added to by Australia ICOMOS.

ARTICLE 8
New construction work, including infill and additions, may be acceptable provided:

- it does not reduce or obscure the cultural significance of the place
- it is in keeping with Article 8.

ARTICLE 9
Some structures were designed to be readily removeable or already have a history of previous moves, e.g. prefabricated dwellings and poppet-heads. Provided such a structure does not have a strong association with its present site its removal may be considered.
If any structure is moved it should be moved to an appropriate setting and given an appropriate use. Such action should not be to the detriment of any place of cultural significance.

ARTICLE 11
Preservation protects fabric without obscuring the evidence of its construction and use.
The process should always be applied:

- where the evidence of the fabric is of such significance that it must not be altered. This is an unusual case and likely to be appropriate for archaeological remains of national importance
- where insufficient investigation has been carried out to permit conservation policy decisions to be taken in accord with Articles 23 to 25.

New construction may be carried out in association with preservation when its purpose is the physical protection of the fabric and when it is consistent with Article 8.

BURRA CHARTER

ARTICLE 12. *Preservation* is limited to the protection, *maintenance* and where necessary, the stabilisation of the existing *fabric* but without the distortion of its *cultural significance.*

Restoration

ARTICLE 13. *Restoration* is appropriate only if there is sufficient evidence of an earlier state of the *fabric* and only if returning the *fabric* to that state recovers the *cultural significance* of the *place.*

ARTICLE 14. *Restoration* should reveal anew culturally significant aspects of the *place.* It is based on respect for all the physical, documentary and other evidence and stops at the point where conjecture begins.

ARTICLE 15. *Restoration* is limited to the reassembling of displaced components or removal of accretions in accordance with Article 16.

ARTICLE 16. The contributions of all periods to the *place* must be respected. If a *place* includes the *fabric* of different periods, revealing the *fabric* of one period at the expense of another can only be justified when what is removed is of slight *cultural significance* and the *fabric* which is to be revealed is of much greater *cultural significance.*

Reconstruction

ARTICLE 17. *Reconstruction* is appropriate where a *place* is incomplete through damage or alteration and where it is necessary for its survival, or where it recovers the *cultural significance* of the *place* as a whole.

Words in italics are defined in Article 1.

Explanatory Notes

These notes do not form part of the Charter and may be added to by Australia ICOMOS.

ARTICLE 12
Stabilization is a process which helps keep fabric intact and in a fixed position. When carried out as a part of preservation work it does not introduce new materials into the fabric. However, when necessary for the survival of the fabric, stabilization may be effected as part of a reconstruction process and new materials introduced. For example, grouting or the insertion of a reinforcing rod in a masonry wall.

ARTICLE 13
See explanatory note for Article 2.

BURRA CHARTER

Explanatory Notes

ARTICLE 18. *Reconstruction* is limited to the completion of a depleted entity and should not constitute the majority of the *fabric* of a *place.*

ARTICLE 19. *Reconstruction* is limited to the reproduction of *fabric* the form of which is known from physical and/or documentary evidence. It should be identifiable on close inspection as being new work.

Adaptation

ARTICLE 20. *Adaptation* is acceptable where the *conservation* of the *place* cannot otherwise be achieved, and where the *adaptation* does not substantially detract from its *cultural significance.*

ARTICLE 21. *Adaptation* must be limited to that which is essential to a use for the *place* determined in accordance with Articles 6 and 7.

ARTICLE 22. *Fabric* of *cultural significance* unavoidably removed in the process of *adaptation* must be kept safely to enable its future reinstatement.

CONSERVATION PRACTICE

ARTICLE 23. Work on a *place* must be preceded by professionally prepared studies of the physical, documentary and other evidence, and the existing *fabric* recorded before any disturbance of the *place.*

ARTICLE 24. Study of a *place* by any disturbance of the *fabric* or by archaeological excavation should be undertaken where necessary to provide data essential for decisions on the *conservation* of the *place*

Words in italics are defined in Article 1.

and/or to secure evidence about to be lost or made inaccessible through necessary *conservation* or other unavoidable action. Investigation of a *place* for any other reason which requires physical disturbance and which adds substantially to a scientific body of knowledge may be permitted, provided that it is consistent with the conservation policy for the *place.*

ARTICLE 25. A written statement of conservation policy must be professionally prepared setting out the *cultural significance,* physical condition and proposed *conservation* process together with justification and supporting evidence, including photographs, drawings and all appropriate samples.

ARTICLE 26. The organisation and individuals responsible for policy decisions must be named and specific responsibility taken for each such decision.

ARTICLE 27. Appropriate professional direction and supervision must be maintained at all stages of the work and a log kept of new evidence and additional decisions recorded as in Article 25 above.

ARTICLE 28. The records required by Articles 23, 25, 26 and 27 should be placed in a permanent archive and made publicly available.

ARTICLE 29. The items referred to in Article 10 and Article 22 should be professionally catalogued and protected.

Words in italics are defined in Article 1.

Appendix B: Heritage listings

Register of the National Estate

NATIONAL ESTATE CITATION

Name of place: PIPEMAKERS PARK - PART
Former/ other names: MELBOURNE MEAT PRESERVING CO WORKS

Registration number: 005495

Group: 09 COMMERCIAL BUILDINGS

Date: 1847, 1868

File Number: 2/12/051/0001/01
Status: 67 NOMINATION- TO BE ENTERED IN THE INTERIM LIST
Date: 11/04/94

Area (Ha): 10.00

Nearest town: MARIBYRNONG
Distance (km): Direction from town:

Location/boundaries:

About 10ha, Van Ness Avenue, Maribyrnong, comprising that part of Pipemakers Park bounded on the north West by Van Ness Avenue and Gordon Street, on the north by AMG northing (Zone 55) : 591700mN, and on the south by the southern alignment of Williamson Road, Maribyrnong.

Property information:

SECTION XXI PART OF LOTS 6 & 7, PARISH OF CUT PAW PAW COUNTY OF BOURKE.

Local authorities :

SUNSHINE CITY

Statement of significance:

The place known as Pipemakers Park includes three large bluestone buildings dating from 1868 and 1847 with other attached structures and the remains of the brick and bluestone boiler chimney. It is significant for its continuous association with the industrial development of Victoria from the 1840's, representing one of the first large scale industries in the colony. (Criterion A4)

The complex demonstrates the development of the site in the 1860's and 1870's to become the largest and most successful of the meat-preserving and canning works in Victoria, playing an important part in the history of industrial growth in Melbourne's western suburbs.
(Criterion A4)

The remaining bluestone buildings from this era represent a rare example of a meat-preserving and canning factory, in which meat preserving was pioneered internationally on a commercial scale.
(Criterion B2)

The complex is an outstanding example of a nineteenth century factory, executing a high standard in the local basalt stone and demonstrating local building skills (Criterion D2).
002
The place demonstrates the pioneering technology and skills of Australian manufacturer, S.S. Ritchie, and the designer and building of the works, Albert Purchas and John Pigden. The Melbourne Meat Preserving Company, established in 1868, was the first such company in Australia and was an innovator in the fields of food preserving, transportation technology, material handling and refrigeration. The firm's expertise was used by many other firms such as Flemington Meat Preserving Company established by the Melbourne Meat Preserving Company's chief preserver, W. Anderson. (Criterion F1)
032
The complex is also associated with the first commercial frozen meat export factory in Australia under the Australian Frozen Meat Export Company, established in 1880-82. It became the model for many other such enterprises, including the first frozen meat industry in New Zealand. (Criterion A4)

Pipemakers Park is also significant as the site of the first manufacture of centrifugally-spun reinforced-concrete pipes in Australia, made by the Hume Pipe Company from about1914. This firm exported their technology interstate and overseas, both by licensing other manufacturers and established factories for which the machinery was made at the Maribyrnong works. (Criterion F1)

Significant associations:
JOSEPH RALEIGH
WORKS MANAGER

Description:
In 1847 Joseph Raleigh, a leading merchant, ship owner and pastoralist in Victoria, purchased the site from the Crown and built a meatworks and boiling down establishment. Higher up the hill on the same land was a building known as Raleigh's Castle, reputed to have been used as a lodging house for his workman. In 1867 the Melbourne Meat Preserving Company was formed and pastoralists, merchants and stock and station agents were the main shareholders. Its aim was to preserve and export meat to England, in an effort to cope with the problem of surplus stock in the colony. Samuel Sextus Ritchie's process of meat preserving was adopted- a vacuum process by which meat was preserved in tins.
In 1868 the company obtained a lease of the estate formally occupied by Raleigh as a boiling down establishment. Buildings were constructed to designs by architect Albert Purchas, and the site was transformed from "dilapidated buildings known as Raleigh's Boiling-down Establishment...with some addictions....into a regular and well organised factory...capable of disposing of 3,000 sheep and 50 head of oxen per week". (Illustrated Australia News, October 1878,p12). In 1872-73 building extensions were carried out. A fire occurred at the factory in 1973, and some damage was done to the preserving room. The cooling rooms were completely gutted. Rebuilding, repairs and renovations were carried out in 1874-76, and an article in the Argus of October 1874 described the rebuilding of the "central portion of the meat-preserving works". A later article in 1882 sums up this transformation. By 1882 the Australian Frozen Meat Export Company was operating on the site. This operation ceased in 1882 when new freezing works were commenced at Williamstown. In 1888 the Melbourne Meat Preserving Company went into liquidation, and little use was made of the former meat works buildings in the years immediately following the collapse of the company. Hume Brothers acquired the site and buildings in about 1914, to establish a reinforced concrete woks. By 1951 the Hume complex was described as " the largest manufacturers of steel reinforced concrete pipes in Australia" (Sunshine Cavalcade 1951, p77).
035
The place is defined as the land known as Pipemakers Park and incorporates the several historic buildings and structures within the park, but not including the recent structures such as the caretaker's cottage or toilet block attached to one of the historic buildings. The

site as it stands today includes three large bluestone buildings dating to 1868 and 1874 with other attached structures and the remains of the brick and bluestone boiler chimney. The main preserving department building (B2) demonstrates the fire-proof technology of the 1870's with its cast and wrought-iron roof trusses, purlins, windows frames and other fittings while the wrought iron beams and cast-iron beams and cast iron columns of the tallow store (B1) demonstrates another approach to fire proof buildings. Architectural features of the main building include louvred oculus vents, roo ridge vent, tall windows extending from the eaves almost to the ground and high western windows which reflect on the industrial design of the building for light and ventilation. The nearby testing department/ machine shop (B3) retains a large section of c1868 bluestone structure but has been reconstructed around the turn of the century in timber and iron. Remnants of other 1860's-70's buildings can be seen from foundations and wall fragments. These include the 1868 tinshop and possible site of the boilerhouse. Later addictions relating to the Hume Pipe Works include the foundations of the 1920's eight foot pipe factory and the 1940's four and six foot pipe factory as well as the electricity substation. These are constructed in concrete timber and corrugated iron in a makeshift manner contrasting with the solid nineteenth century buildings and the advanced technology of the Hume's Company themselves. Remnants of the garden planted by Hume's workers survive, as do some of the extensive pipe curing racks.

Condition:

The surviving bluestone buildings are in fair condition although only a portion of the original structures remain and stabilisation of some walls is necessary although the owners have carried out extensive repairs and drainage works since 1980. Further buildings remans may be revealed through careful archaeological excavations. Of the once extensive Hume Pipe Co. addictions, only part of one factory remains and this is in poor condition, requiring urgent repairs and stabilisation. None-the-less, sufficient of the nineteenth and twentieth century structures remain to exhibit the significant aspects of the site.

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National Trust Register

File: 4730 Name: Hume Pipe Co(form Melbourne Meat Preserving Co)

Citation type: Trust

Meat canning became really important in world trade in the late 1860s, when a major export trade developed between Australia and Britian. This trade was effectively pioneered and for some years dominated by the Melbourne Meat Preserving Co. Established in 1868, it employed several hundred workers to operate the first large scale meat cannery in Australia. It provided the inspiration and model for many later meat canning companies as well as trained personnel. The main buildings of the company are substantially intact, designed as an open-plan factory on several levels, an adaptation of English industrial design. In its day the factory was commended for its efficiency, cleanliness and automation.

The Humes Pipe Co, established in 1911, pioneered in the production of centrifugally-spun concrete pipes, a process invented in South Australia by E J & W R Hume. In 1920 the process received a world-wide patent, and factories were constructed in New Zealand, South Africa, Malasia, England, Singapore, and U.S. A. the Maribyrnong factory was the largest concrete pipe factory in the Southern Hemisphere and is the oldest remaining Humes factory in Australia. Humes pipes were used throughout Australia and many parts of the world for water supply, sewerage, irrigation and draingae works. The firm pioneered a new technology and exported [illegible]ations throughout the world, The Australian process of [illegible]crete pipes bacame world famous; it is still the basic [illegible] by a large part of the world's concrete pipe industry.

Clarified 9/3/82

Western Region Industrial Heritage Study

SITE NO: 0002 SITE NAME: Melbourne Meat Pres. Co.

ADDRESS: Van Ness Avenue Maribyrnong

MAP REFERENCE: 28 B 9

DATE: 1868 -1888 CONDITION: A Ar H

CONSERVATION LEVEL: A

ON EXISTING REGISTERS: NTC 4730 GBR

COMPANY NAME: Melbourne Meat Preserving Co.

SITE TYPE: animal by products preserved meat

DESCRIPTION: Several large bluestone buildings of distinctive design on several levels. Features include remnants of of brick ovens, boiler foundations and flues. Wrought iron roof trusses and beams and cast iron columns indicate fire proof technology of the mid to late 19th century, particularly in the northernmost building which was probably a tallow store. Remains of underground flues and foundations of demolished buildings offer scope for future archaeological investigation. The largest building is on two levels with an arched brick colonade between them and circular louvered vents in the twin gables at each end. Arched openings between buildings have been concreted in in the 20th century. Existing buildings date from 1868, 1872-4 and the 1940s.

HISTORY: Originally a boiling down works established by Joseph Raleigh in c. 1847, occupied by Robertson Martin & Smith in 1853-4 where Australia's first steam Locomotive was built. The buildings were refurbished for the production of preserved, tinned meat by a vacuum cooking process by the MMPC in 1868. The works was hygienic and modern and the largest of the early preserving works. It continued to operate until c. 1888 when declining demand forced its closure. The Australian Frozen Meat Export Co 1880-2 (see

and 0021) and the Hume Pipe Co. 1911-79 were other innovative industries to occupy the site.

PEOPLE ASSOCIATED WITH THE SITE: Joseph Raleigh, Samuel Sextus Ritchie. 1825-1877, co.mgr. Petty, G. owner 1868-9 Hume, Walter Purchase Albert architect for 1868 conversion, A.G. Park mgr.

SIGNIFICANCE: The original boiling down works was one of the first of its type in Australia and the largest in Victoria, the Melbourne Meat Preseerving Co. pioneered meat preserving, as the Australian Frozen Meat Export Co. pioneered bulk freezing, Robertson Martin & Smith were the makers of the first locomotive in Australia and Hume Pipes were an innovator in the field of concrete pipe manufacture. This site is clearly one of the most significant industrial sites in Victoria if not Australia, having substantial remains of buildings connected with major innovative manufacturing processes of particular relevance to the country's development. The river location demonstrates the importance of maritime communication to early industry as well as the need for a water source and drain. This site encapsulates the history of industrial development in Melbourne and represents some of its major phases.

RECOMMENDATION: The site is presently being managed as an historical parkland with an interpretation prgram a compnent of that management. It is desireable for this role to be expanded and further research be conducted into the earlier buildings possibly employing archaeological methods. Compatible uses should be found for the remaining vacant buildings. before any further excavation of disturbance of buildings is carried out, a detailed archaeological assessment should be made of the effected area. The Historic Buildings Council and the Victorial Archaeological Survey should continue to be consulted over future development on the site.

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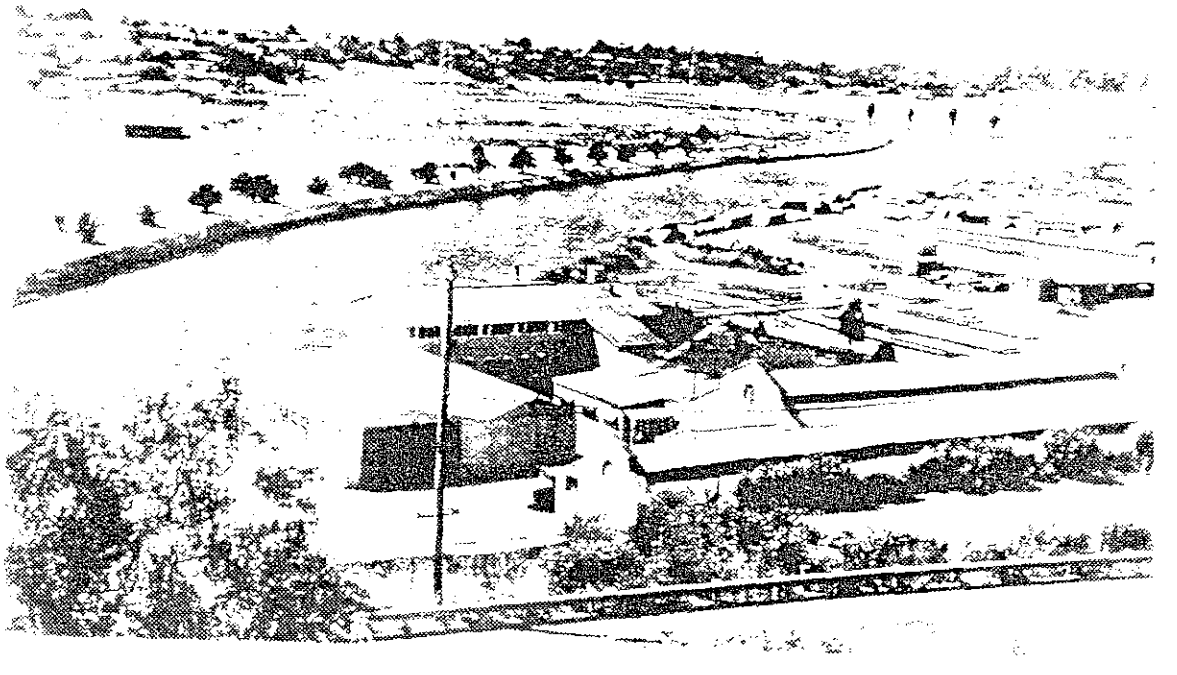

Hume Pipe Works c.1974 Footscray Historical Society

Appendix C: Work of Albert Purchas from Miles Lewis' Australian Architects Index

(contracts thought to relate to the industries and the principals of the companies associated with the study area are highlighted in bold)

Albert Purchas

1853 4-roomed cottage, Prahran
8-roomed Warehouse near the Flagstaff
2 WB cottages
Store & stable at Flemington
Auction room and offices
1854 2-storey brick house at St.Kilda, H.F. Gurner
Mortuary chapel at Melbourne General Cemetery
Store for T. Kenny in Collins Street
2 large iron stores for E. Westby & Co.
2-storey brick house and offices, St.Kilda
1855 Lodges and entrance gates to Melbourne General Cemetery
4 shops in Bourke Street East for J. Gardiner
1856 Melbourne Savings Bank, cnr, Market Street and Flinders Lane (demolished 1930)
6 houses, East Melbourne
2 brick houses , St. Kilda
Large shop in Bourke Street
2 houses in St.Kilda

Purchas & Swyer

1855-6 Engaged to report on deterioration of St. John's, Heidelberg
1856 Letting of tenders for Savings Bank at corner of Flinders Lane, on the Customs House Reserve.
Erection of a 2-storey house at St.Kilda for T.G. Faxton.
Foundation wall of Brunswick church.
1857 'Diocesan architects, Purchas & Swyer, submitted plans for the first portion of Christ Church, Brunswick'. Foundation stone, April, 1857. Opening 13/9/1857. Consisted of present nave up to 4th window. (completed by Frederick Wyatt and Thomas Watts)
Designed Christ Church, St.Kilda, (*Victoria and its Metropolis*, vol. 2, p.406.
Erection of refreshment rooms and entrance gates for W.H. Johnson.
Erection of a dwelling house in Collins Street east for J.B. Fraser.
Ornamental iron gates, Melbourne General Cemetery.
Erection of a dwelling house at St.Kilda for F.T. Van Henert.
Erection of a dwelling house 14 miles from town for Walter Clark (Glenara homestead, Bulla)
Large warehouse in Melbourne for J.G. Foxton
Bluestone store for H.M. Murphy
Bank and outbuildings at Beechworth for Bank of Australasia
Erection of 4 shops at St. Kilda for Paul Joske
Erection of the Gisborne parsonage
Erection of 2 stores, corner of Bourke and Queen Street, for S.H. Bear.
Tenders for erection of a bluestone store in William Street for Raleigh, Dauglish, White & Co. (*Argus*, 25 November 1857, p.6)
Erection of 2 houses at St.Kilda for Mrs Richardson.
1858 Erection of a hotel in Bourke Street for Hugh Short.
Erection of a house and offices for H.W. Dauglish, near Toorak
Erection of a hotel at Queenscliff for W. Adamson.
1859 Additions to St.Kilda parsonage
Bank and offices at Geelong for Bank of Australasia.

Tenders for erecting parsonage at Heathcote
Tenders for building a portion of the church at Benalla.
Tenders for organ gallery, Christ Church, St.Kilda.
1860 Lodge at Melbourne Racecourse Reserve.
Premises at Heathcote for Bank of Australasia.
Additions and alterations to Heathcote Hotel.
1861 Hotel at Castlemaine for Faulder Watson.
Erection of a shop in Little Collins Street.
Erection of a portion of Queenscliff church.

***

Albert Purchas

1862 Brick cottage, Royal Park
Portion of St.George the Martyr, Church of England ,Queenscliff (*Aust Sketcher*)
Roofing of Malmsbury church
1863 4-roomed house, Caulfield, for Alderman Hill
Office for an insurance company, Collins Street West
1864 Offices and store in Queen Street, for McCulloch, Bell & Co.
Additions and repairs to Christ Church parsonage, St. Kilda
Stone house at Port Melbourne
Northern Fire & Life Insurance Co. Offices (illust.)
Brick house, Brighton, Walter Clark
Store (warehouse) in Elizabeth Street
1865 Alterations to Christ Church, St. Kilda
2 warehouses in Elizabeth Street for J.J. Gibson
1866 Auction notice: 3 storey bluestone stores long occupied by Messrs D. Campbell, between Bank Place and Temple Court, architect: A. Purchas
Office, Booroondara Cemetery
Part of outpatients' building of Lying-in Hospital
1867 New entrance gates to Melbourne General Cemetery
Donnybrook church
1868 Portion of Yea church
1869 12 stone cottages, Maribyrnong (*Argus*, 24 November 1869, p.3)
1872 Erection of extensive additions to Australian Wool Stores, Collins Street West, for Hastings Cunningham & Co.
Large building corner of Queen and Flinders Street for J. and R.D. Jackson
1873 Bluestone stores in Flinders Street
School House for Kew High School
Additions to Kew High School
1874 Large bluestone store and other works adjoining Australian Wool Stores, Collins Street West, for Hastings Cunningham & Co.
Brick cottage adjoining railway station, Hawthorn
Brick additions to house, Williams Road, Toorak
Galvanised iron fencing for Booroondara cemetery
Additions and alterations to Southern Insurance Co., 31 Queen Street
Brick additions to house in Hawthorn
Alterations to Kew High School
2-storied additions to Toorak House
1875 Wooden school house, Hawthorn
Small iron gate, Melbourne General Cemetery
Brick stable buildings, Studley Par, Kew
Additional building, Elizabeth Street, Messrs Briscoe's iron yard
Brick additions to parsonage, Malvern
Additions to the Refuge, Carlton
Galvanised iron fencing, Cemetery, Kew
1876 Additions to school, Malvern
Brick additions to house at Toorak

Brick building, gardens, Royal Park
1877 East St.Kilda Presbyterian Church (*Australasian Sketcher*, 9 June 1877, pp.38-9)
Additions to the Refuge, Carlton (Keppel Street)
Tower of St.George's, Queenscliff
Building in Flinders Street
New warehouse in Collins Street for Briscoe & Co.
(*Australasian Sketcher*, 1 September 1877, p.87)
Fittings to Messrs Briscoe's buildings
Cast iron balusters and newels, Messrs Briscoe's buildings
Additions and repairs to stable buildings (wood) in Boundary Road, East Toorak
Strongroom, additions and alterations to office of Northern Assurance Co.
Chimney 200 foot high at Yarraville, for Australian Pyrites Co.
(*Argus*, 22 August 1877)
St.George's, Chapel Street, St.Kilda (report on opening, *Argus* 1 October 1877, p.5)
1878 Illustration of building erected for Messrs Briscoe & Co., Collins Street
(*Illustrated Australian News*, 10 June 1878, p.107) Cost of £18,000.
Argus, 8 July 1878, detailed description)
Brick additions to house, Cotham Road, Kew
Brick additions to building in the Gardens, Royal Park
Building additions at the Refuge, Carlton
Small brick building, St.James Park, Hawthorn
Tenders required for erecting wooden building on stone foundations at Maribyrnong, (*Argus*, 18 October 1878)
Sale notice for family mansion of James White Esq., corner of Auburn Road and Burkes Road, Hawthorn (Extensive description, *Argus*, 7 December 1878, p.10)
1879 Buildings of Mutual Assurance Society, Collins Street West
Brick additions to house, Hawthorn
Additions to Kew High School
Design of offices for Mutual Life (*Australasian Sketcher*,27 September 1879, p.103.)
1880 Completion of St.George's Presbyterian Church, East St.Kilda
Tenders wanted for erecting buildings at Maribyrnong for the Australian Meat Export Company Ltd. (*Argus*, 2 August 1880,p. 2)
Brick additions to house at Kew
Sale notice for J.B. Ware, Heyington Place, Toorak, 'of recent construction, built under supervision of Mr Purchas, architect'.
Melbourne Chambers, 'erected in 1881, to Mr Purchas's design'.
(*Old Pioneers' History of Melbourne*, p.240)
1881 Brick cottage , near St.Kilda
Additions to Australasian Wool Store
Building Little Collins Street and Bourke Street West
Billiard room and other additions, Orrong and Inkerman Roads
Brick residence, Malvern
1882 Design of Barristers' Chambers, Little Collins Street and Bourke Street West
(Illustration in *Australasian Sketcher,* 28 January 1881)
Additions to the Refuge, Carlton
Large iron shed, Apollo Co., Footscray (*Argus*, 12 May 1882, p.3)
Brick additions to building in Zoological Gardens
Auction notice: Briscoe & Co.'s retail warehouse in Collins Street, designed by well-known architect, A. Purchas Esq. 'The 5-storey shop is designed in the Italian style very freely handled. Also one storey bluestone warehouse at rear. Extensive description of the property. (*Argus*, 14 October 1882)
Brick residence Malvern
1883 Superintendent's house and cottages at Corranderrk for Board of Protection of Aborigines.
Brick additions to Doona, Kew
1884 2-storey brick house Studley Park
2-storey brick residence, coach house and stables, South Yarra
Large stone cellar at Yeringberg for G. de Pury

6-roomed cottage at Corranderrk
1886 Cottage (wood) in Greensborough
Additions to house Royal Park, also new reptile house
Brick residence at Alexandra
Additions to house, Harcourt Street, Hawthorn
Illustration of St.George's Presbyterian Church, East St.Kilda
(*Australasian Sketcher*, 24 August 1886, p.131)
National bank of Australasia, branch at Victoria Street East [possibly Abbotsford]
Design for new wing of Women's Hospital
1887 A. Purchas' design for new wing selected
Additions to store
2 cottages (wood)
Erection of brick addition to South Lodge, Melbourne General Cemetery
Stone and brick additions to 3 lodges, Melbourne General Cemetery
5-storey premises corner of Collins Street and Russell Street.
(*Australian Federal Directory* 1888)
1888 Schoolroom,, Kew
1889 Parsonage, Kew
2-storey brick hotel, Camberwell
Additions to banking premises and 2 shops adjoining, Prahran
Erection of branch of National Bank, Prahran
Additions to Savings Bank
Residence for Robert Sellars Esq., Dandenong Road and Alma, Road, Malvern
1890 **Brick stabling etc. for Hon. Robert Simson, in Toorak**
Extensive homestead for Andrew Ronan Esq. at St.Hubert's.
1891 Brick elephant house, Zoological Gardens

Appendix D: Exports of preserved meat from Victoria & Australia

Total	VIC-	Total Aust	%
1866	less than 3 tons	-U.K.	
1869	1,471 tons	1,928	76%
1870	2,821 tons	3,855	73%
1871	6,563 tons	9,383	70%
1872	4,789 tons	8,852	54%
1873	3,946 tons	7,133	55%
1874	2,883 tons	5,982	48%
1875	2,132 tons	3,360	64%
1876	2,683 tons	4,943	54%
1877	1,993 tons	6,230	32%
1878	1,208 tons	1,958	62%
1879	1,132 tons	4,019	28%
1880	2,643 tons	6,385	41%
1881	1,624 tons	6,371	26%
1882	442 tons	5,179	9%
1883	1,241 tons	7,942	16%
1884	963 tons	5,191	19%
1885	563 tons	5,655	10%
1886	175 tons	1,819	10%

(Total of preserved meat exported from Vic.1868-1882 36,490 tons
MMPC 1868-1882=25,400 tons 70% of total Victorian exports during that period)

Appendix E: Examples of documents relating to the history of the study area

Memorandum of Association of a Company limited by shares

P.R.O.
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Memorandum of Association

of the

Melbourne Meat Preserving Company (Limited) by shares.

1st. The name of the Company is The Melbourne Meat Preserving Company (Limited).

2nd. The objects for which the Company is established are

1. The purchase in Victoria or any of the Australian colonies of Oxen sheep and other animals alive or dead.
2. The preserving, salting, smoking freezing, drying or otherwise curing of meat by any process whatever in all or any of such colonies.
3. The manufacture of Tallow.
4. The general utilization of animal matter.
5. The exportation of all products manufactured or otherwise to any part of the world.
6. To borrow money for all or any of the purposes aforesaid.
7. To do all such other things as are incidental or conducive to the attainment of the above objects.

3rd. The liability of the Members is limited.

4th. The capital of the Company is Fifty thousand pounds in Ten thousand shares of Five pounds each.

We the several persons whose names and addresses are subscribed are desirous of being formed into a Company in pursuance of this Memorandum of Association and we respectively agree to take the number of shares in the Capital of the Company set opposite our respective names.

Names, addresses and descriptions of Subscribers	Number of shares taken by each subscriber
Hugh Glass. Flemington. [illegible] (One Hundred	Shares 100
William [illegible]. Commission Agent, Melbourne	100
James White – Merchant – Melbourne One Hundred	100
Samuel H. Gibbs Merchant. Melbourne Fifty	50
George [illegible] [illegible] Melbourne one hundred	100
[illegible] [illegible] [illegible]	100
[illegible] [illegible] [illegible] [illegible]	40
James C. [illegible] do Melbourne fifty	50
William [illegible] do [illegible]	40
[illegible] Lang do [illegible] [illegible]	20

Dated the 14th day of Feb. AD 1868.

Witness to the above signatures. [illegible]

Hugh Glass
[illegible]

Names addresses and descriptions of Subscribers (continued)			Number of Shares taken by each Subscriber
John Cochran Squatter St Kilda		One Hundred shares	(100)
[illegible] Stock agent Melbourne		Fifteen shares	15
[illegible]	Stock Agent Melbourne	Fifteen shares	15
Geo. Jno Summers	Merchant Melbourne	Fifty	50
A Cunningham	Wool Broker	Fifty	50
Geo. Fairbairn	Squatter	Fifty	50
	Brick Point		
Henry Wooldridge Surgeon South Yarra		twenty	20
Edward John	Merchant Melbourne	twenty	20
Walter Clark	Ballan	Fifty	50
William Jones [illegible]	Melbourne	twenty	20

Dated 14th day of February 1868

Witness to the above signatures

S. S. Ritchie

56 Queen Street

Melbourne

Melbourne Meat Preserving Co Limited

In Liquidation

Notice is hereby given that a General Meeting of the Shareholders of the Melbourne Meat Preserving Company Limited in Liquidation was held at 93 Queen Street, Melbourne on Thursday the 18th day of April 1889 when the following Resolution was passed viz.

"That the Account of the Liquidator as submitted be "adopted and that the books of the Company be kept in "the possession of the Liquidator for two years and then "destroyed."

D. H. Duerdin

Liquidator

To the Registrar General

Melbourne

HUME PIPE NEWS

A Bulletin of information on Hume Pipes (Concrete), issued Monthly by the Hume Pipe Coy. of Australia and New Zealand

Head Office:
Kinnear House, corner King and Little Collins Streets, Melbourne.

Chief Branches:
Brisbane, Adelaide, Hobart, Perth and Auckland (N.Z.).

Vol. V. No. 11 April, 1928

The Story of a Pipe

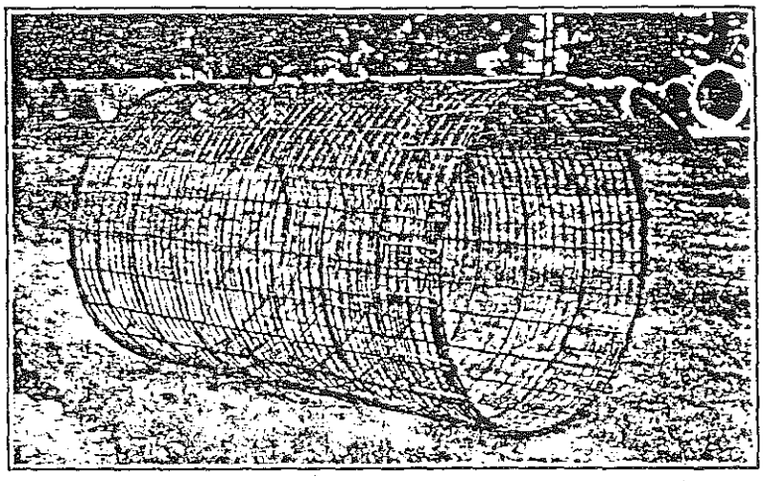
The process of making Hume pipes is very simple. First the wire reinforcement is made up into cages of exact diameter by either using a fabricated wire mesh or by winding wire on a collapsible drum in a spiral fashion, the spiral being held in place by longitudinal wires. The reinforcement, varying in weight and strength according to the pressure or external load the pipe is designed to carry, is placed in the steel mould. Flanges or end rings, cast to form the ends of the pipe, are attached to the ends of the mould. These rings are of a depth equal to the desired thickness of the wall of the pipe.

The mould is then laid horizontally on a machine consisting of friction rollers which set the mould revolving. While the mould is turning at a low speed the amount of concrete necessary for the pipe is inserted. The centrifugal force of the spinning action causes this concrete to distribute itself evenly over the inner surface of the mould completely embedding the reinforcement. The speed is then increased. After spinning for a few minutes the mould is brought to rest, and the excess water, which by the action of the centrifugal force has been expelled from the concrete, is allowed to run off. The machine is then restarted and the pipe once more spun for about two minutes. During the final process the inside of the pipe is burnished by passing a steel bar over the surface. The mould containing the pipe is then taken from the machine and rolled into the curing chamber where it is cured in wet steam at a temperature of approximately 100 deg. Fahr. for seven to 12 hours.

The pipes are steam cured in order to secure the hardening of the concrete under the best conditions. The warmth of the steaming chamber hastens the hardening of the concrete while the moisture in the steam prevents any tendency of the concrete to dry out or crumble. It has been definitely proven that concrete of the greatest strength is obtained by curing under warm moist conditions and the steaming process provides both of these conditions.

It is advisable to have the temperature and humidity in curing chambers controlled by automatic mechanical devices but very satisfactory results can be obtained by a reliable attendant at the plant.

When the pipe is taken out of the curing room, the mould is removed and the pipe placed in the curing yard for further curing by spraying and storage until such time as it may be required for use.



Reinforcement of Hume Pipe

The process of manufacture is as rapid as it is simple. The length of time required for making a pipe varies according to the diameter. Two pipes of 36-in. diameter, 8 ft. long, or four pipes 4 ft. long, require about 10 minutes of spinning; while pipes of the same length, but 4 in. in diameter, are turned out at the rate of one every minute, six pipes 6 ft. long or 12 pipes 3 ft. long being made on one machine at one operation.

The Hume process provides for economy in a dual way. First, the small initial investment required and the speed of production results in a lower manufacturing cost than can be obtained by any other method. Secondly, the portability of the plant permits its easy transportation to any field of operation where there is a sufficient quantity of pipe to be manufactured. Inasmuch as local products are used, the moving of the plant saves the cost of transportation of the materials and pipes, and also lowers the hazard of breakage.

A Few of the Outstanding Advantages of Hume Pipes

1. Hume Concrete is of the highest quality obtainable by any method of manufacture.

2. Due to the very nature of the process of manufacture and the unvarying mechanical force used, Hume Concrete is uniform in quality.

3. Hume Pipe has a thinner wall than competitive types but due to the superior quality of the concrete it has a greater strength.

4. The steel reinforcing is accurately placed in Hume Pipe.

5. The metal rings used in forming the ends of the pipe produce perfect fitting joints.

6. The packing force of the centrifugal process results in a perfect bond between the steel and the concrete causing them to act as a unit in withstanding load stresses.

7. Any desired amount of steel can be placed at any desired point in the wall of the pipe.

8. As it is impervious at all pressures for which it is designed, the reinforcement being completely embedded is protected from the atmosphere or liquid contained in the pipe, and is therefore not subject to corrosion. This feature makes it especially adaptable for use in sea water.

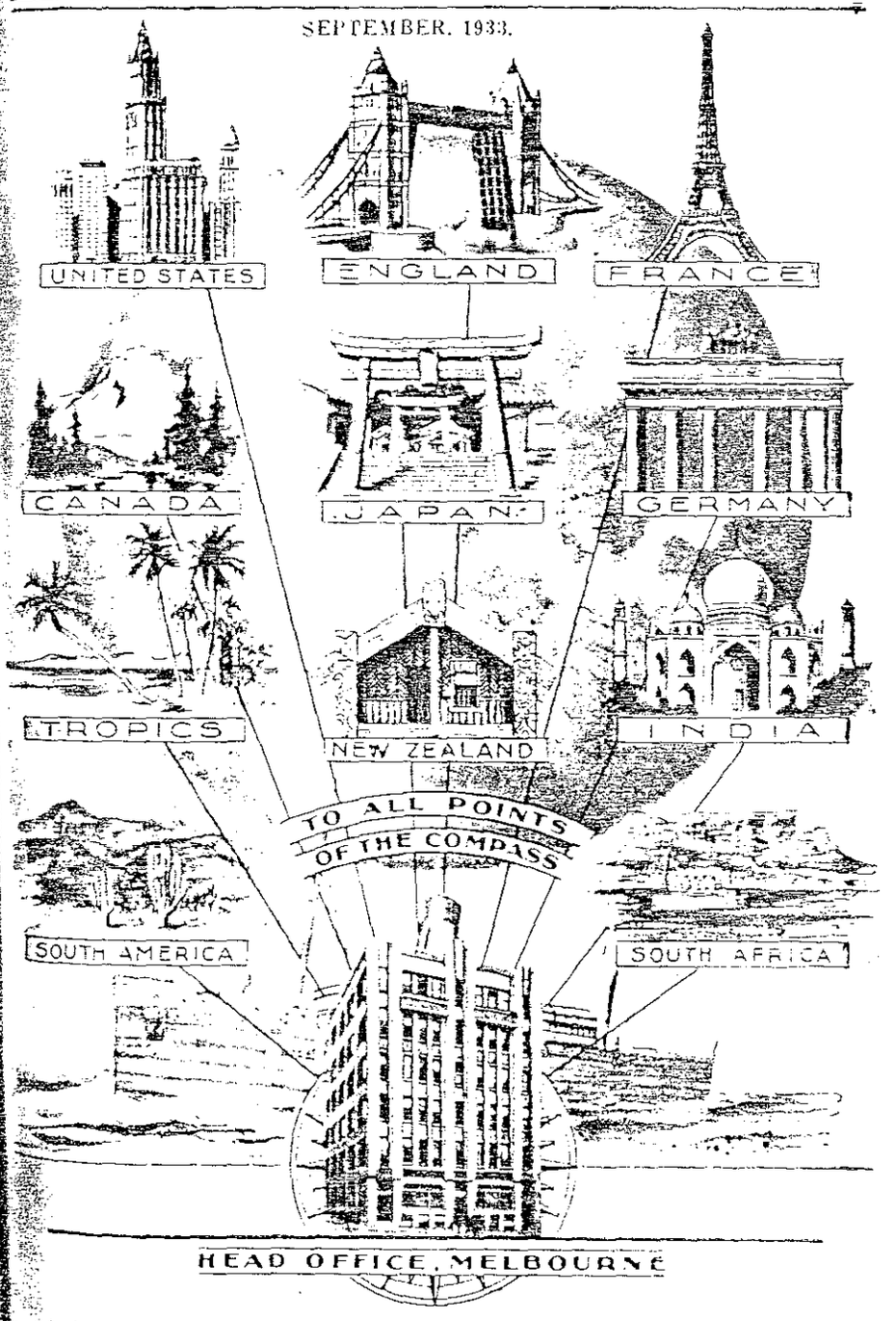
9. Due to the smooth interior surface Hume Pipe has a maximum carrying capacity.

10. Hume Pipe can be produced in any desired lengths up to 10 ft. thus making it adaptable to all laying conditions.

Hume Pipe News, April 1928, p. 4.

HUME PIPE NEWS

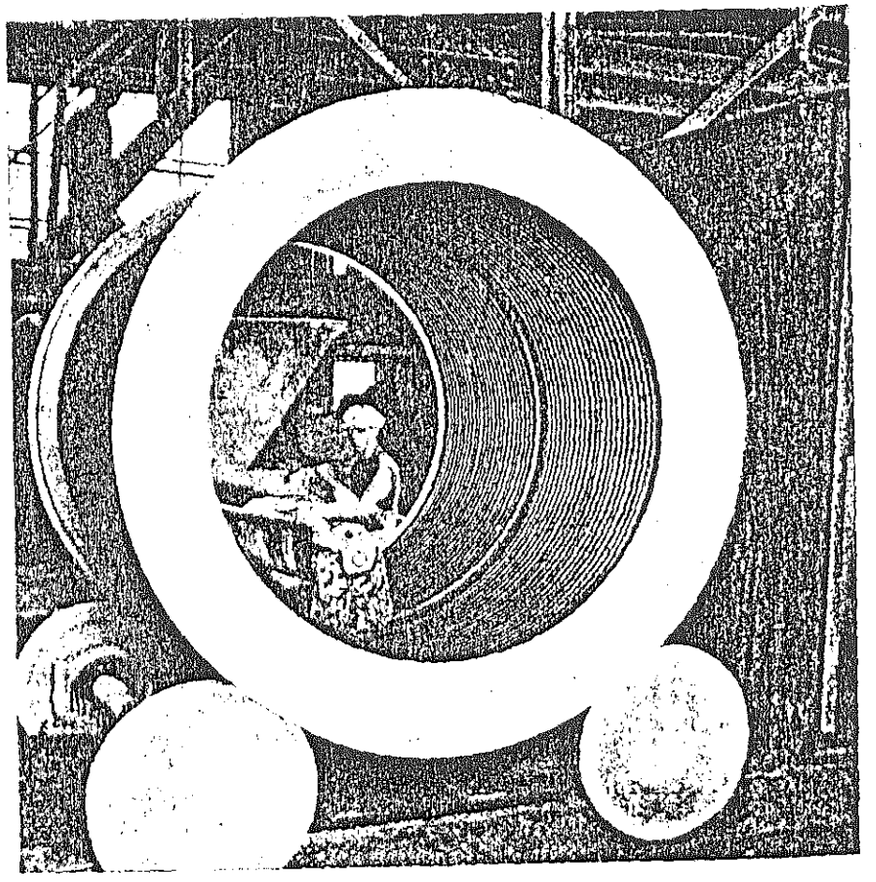
SEPTEMBER, 1933.



Published by the Hume Pipe Company, Kinnear House, King Street, Melbourne.

HUME PIPE NEWS

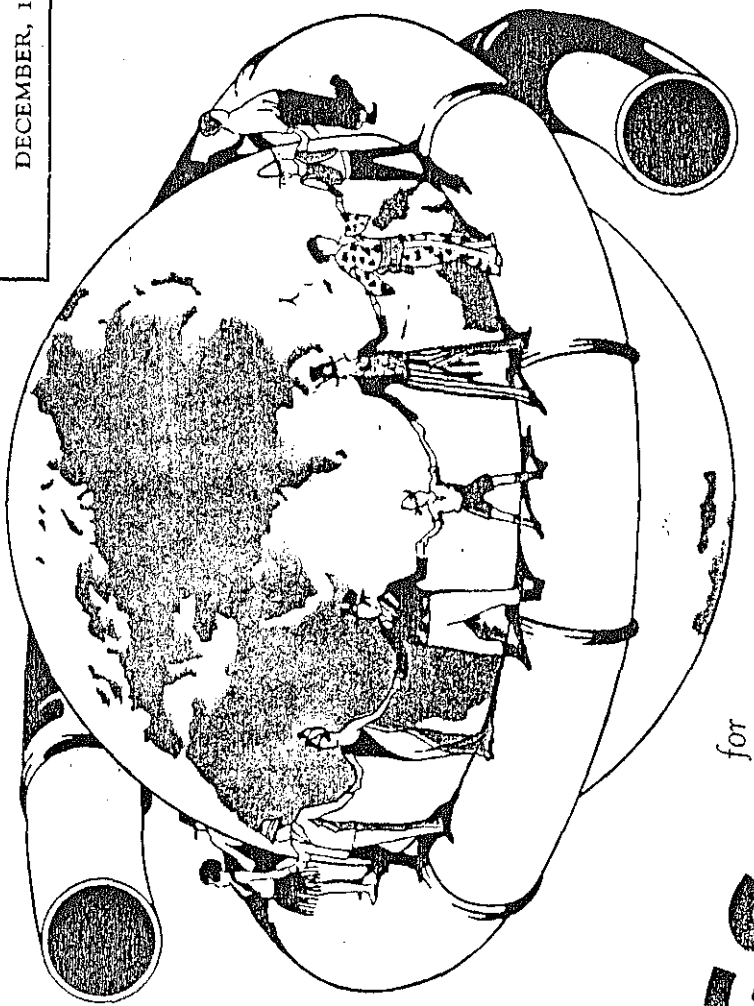
APRIL, 1928



This Illustration shows a Hume Pipe in Process of Manufacture. Note the Reinforcement in the mould

Published by the Hume Pipe Company, Kinnear House, King Street, Melbourne.

HUME PIPE NEWS
DECEMBER, 1929



for Christmas and Well Wishes for the New Year
HUME PIPE COMPANY, Australia

GREETINGS

Appendix F: Sales of Crown Land, Maribyrnong district 1847.

(Study area denoted by *)

Lot	Location	No. of acres	Price	Price per acre	Upset price
Raleigh's lots					
59	Sec. 20, Por. 1	72 acres,	£360-0s-0d	£5-0s-0d	£1-10s
66	Sec. 21, Por. 1	56 acres	£282-16s-0d	£5-10s-0d	£1-10s
67	Sec. 21, Por. 2	40 acres	£240-0s-0d	£6-0s-0d	£2-0s
68	Sec. 21, Por. 3	56 acres	£392-0s-0d	£7-0s-0d	£1-10s
69	Sec. 21, Por. 4	51 acres	£321-6s-0d	£6-6s-0d	£1-10s
70	Sec. 21, Por. 5	47 acres, 2 roods	£ 95-0s-0d	£2-0s-0d	£1-10s
71*	Sec. 21, Por. 6	42 acres	£ 63-0s-0d	£1-10s-0d	£1-10s
72*	Sec. 21, Por. 7	45 acres	£ 76-10s-0d	£1-16s-0d	£1-10s
Total		**409 acres. 2 roods**	**£1,830-4s-0d**		
Johnstone's lots					
60	Sec. 20, Por. 2	44 acres	£176-0s-0d	£4-0s-0d	£1-10s
61	Sec. 20, Por. 3	31 acres 2 roods	£99-4s-6d	£3-3s-0d	£2-0s
62	Sec. 20, Por. 4	41 acres 2 roods	£136-19s-0d	£3-6s-0d	£1-10s
63	Sec. 20, Por. 5	46 acres 2 roods	$192-19s-6d	£4-3s-0d	£1-10s
64	Sec. 20, Por. 6	49 acres	£151-18s-0d	£3-2s-0d	£1-10s
65	Sec. 20, Por. 7	43 acres	£172-0s-0d	£4-0s-0d	£1-10s
Fletcher's lots					
73*	Sec. 21, Por. 8	49 acres	£73-10s-0d	£1-10s	£1 10s
74	Sec. 21, Por. 9	53 acres	£116 12s 0d	£2 4s	£1-10s
75	Sec. 21, Por. 10	36 acres	£144-0s-0d	£4-0s	£2-0s
76	Sec. 21, Por. 11 (*Hobbs*)	51 acres	£224-8s-0d	£4-8s	£1-10s
77	Sec. 15, Por. 1	56 acres	£224-0s-0d	£4-0s	£1-10s
78	Sec. 15, Por. 2	55 acres 2 roods	£227-11s-0d	£4-2s	£1-10s

Appendix G: Summary of land transactions relating to Melbourne Meat Preserving Co. allotments in Maribyrnong

Date	Owner	Land	Comments	Volume & Folio
30 March 1848	Joseph Raleigh Melbourne	45 acres CA 7 sec 21	proclaimed 23 Oct 1847	no 108 page 217 vol 1 112, 1850-51 24519-24721
20 April 1869	George Petty		5 year lease to Melbourne Meat Preserving Co. @ £200 p.a.	
8 Sept 1869	George Petty Great Bourke St East	165 acres 3 roods 11 perches part CA 10 sec 20 part CAs 5 6 & 7 sec 21	two house blocks excised from CA 10 sec 20	vol 324 fol 64631
31 Oct 1870	Melbourne Meat Preserving Company Limited	165 acres 3 roods 11 perches part CA 10 sec 20 part CAs 5 6 & 7 sec 21	subdivision and sale of house lots in CA 10 sec 20	
14 Dec 1871	Charles Richter	1 rood	block of land in Section 20 transferred from MMPC	vol 463 fol 92564
14 Dec 1871	Frederich Raven	1 rood	block of land transferred from MMPC	vol 463 fol 92565
14 Dec 1871	Andrew Wright	1 rood 4 perches	block of land in Section 20 transferred from MMPC	vol 463 fol 92566
8 April 1872	John Hogg	1 rood 4 perches	block of land in Section 20 transferred from MMPC	vol 494 fol 98700
8 April 1872	Alfred Benjamine Colville	1 rood 8 perches	block of land in Section 20 transferred from MMPC	vol 494 fol 98701
8 April 1872	John Freeman	1 rood 4 perches	block of land in Section 20 transferred from MMPC	vol 494 fol 98702

8 April 1872	Percival James Barret	2 roods	block of land in Section 20 transferred from MMPC	vol 494 fol 98703
8 April 1872	William Crafer	1 rood 8 perches	block of land in Section 20 transferred from MMPC	vol 494 fol 98704
8 April 1872	Louis Sentter	1 rood 4 perches	block of land in Section 20 transferred from MMPC	vol 494 fol 98705
8 April 1872	Kingsmill Pennefather	2 roods 8 perches	block of land in Section 20 transferred from MMPC	vol 494 fol 98706
8 April 1872	Nathaniel Edward Matthews	1 rood 4 perches	block of land in Section 20 transferred from MMPC	vol 494 fol 98707
1 May 1872	James William Forward	1 rood 18 perches	block of land in Section 20 transferred from MMPC	vol 496 fol 99247
1 November 1873	Theophile Ibersold	1 rood	block of land in Section 20 transferred from MMPC	vol 638 fol 127437
1 November 1873	Percival James Barrett	3 rood	block of land in Section 20 transferred from MMPC	vol 638 fol 127436
4 Sept 1875	Samuel Wilson Oakleigh Hall St. Kilda, Hastings Cuningham, stock & station agent, James White merchant.	155 acres2 roods 4 perches part CA 10 sec 20 part CAs 5 6 & 7 sec 21	Subdivision and sale of house lots in CA 10 sec 20 New road on Gordon St allignment	vol 790 fol 157919
30 Nov 1877	Walter John Horsely	?	probably on of the section 20 blocks	
28 April 1883	Michael Clancy local farmer, also worked at the meatworks	2 roods 8 perches	block transferred from MMPC	vol 453 fol 290518

2 March 1886	Melbourne Meat Preserving Company Limited	155 acres 2 roods 4 perches part CA 10 sec 20 parts CAs 5 6 & 7 sec 21	transferred from Samuel Wilson and Hastings Cuningham	vol 1797 fol 359308
26 March 1888	Thomas Warr, Collins St. West warehouseman		transferred from MMPC	
26 March 1888	Melbourne Meat Preserving Co.Ltd.		Mortgage discharged 14 Dec 1887	
14 Dec 1888	James McBain Thomas James Finlay Robert Harper		Mortgage forclosed 14 Jan 1907	
18 April 1889	London Chartered Bank of Australia		Mortgage forclosed	vol 3108 fol 635585
4 Jan 1907	Presbyterian Church of Victoria Trusts Corporation	184 acres 3 roods 24.5 perches part CA 10 sec 20 part CAs 5 6 & 7 sec 21	further sale of sec 20 blocks subdivision of river half of CAs 5 6 & 7	vol 3178 fol 635585
8 July 1908	Harry Albert Newman		block on Sloan St. transferred from Presbyterian church	vol 3282 fol 656203
24 March 1910	Patrick Whelan		block on Sloane St. transferred from Presbyterian Church	vol 3406 81037
19 Oct 1911	Andrew Stenhouse	subdivision lot 2 identified 665263	Maribyrnong Pottery site on Van Ness Avenue	vol 3544 fol 708777
13 Feb 1912	Caroline Ahlzweig		about 7 house blocks between White and Sloane Sts.	vol 3573 fol 714519
8 May 1912	Henry Charles Rowe & Arthur Douglas Rowe	subdivided lots 10 and 11, block identified 683246	Site of Maribyrnong Quarry	vol 3638 fol 727573
8 May 1912	Henry Charles Rowe & Arthur Douglas Rowe	subdivided lots 9 and 12, blocks identified 683247	2 blocks adjacent to Maribyrnong Quarry	vol 3638 fol 727573

23 Dec 1912	Henry Rowe	30 acres 2 roods 24 perches	block on White St, and probably other land west of Rosamond Rd.	vol 2672 fol 734255
23 Dec 1912	Henry Rowe	2 acres 3 roods 22 perches	Warrs cottages block cnr Warr's & Maribyrnong Rds	vol 2672 fol 734256
23 Jan 1916	James Kane		easement	vol 3945 fol 788987
5 May 1916	City of Essendon	9 acres 3 roods block identified 800624	Council Quarry site between Warr's Rd and Van Ness Avenue	vol 3967 fol 93276
11 May 1916	Edward Vernon Jones		easement	
28 April 1919	Walter Reginald Hume	7 acres 23 perches subdivision 5111 lots 3 & 4 identified 885053	old homestead block south of Hillside Cr.	vol 4202 fol 840389
10 Feb 1925	Hume Pipe Company (Australia) Limited	26 acres 3 roods 2 perches, subdivision no 5111 lots 5 & 6 part CAs 5 6 & 7 sec 21	comprising two parcels, one the humes site and one the castle & hill quarry site	vol 4968 fol 993444
17 Dec 1969	City of Sunshine	Part subdivision 5111 lot 4	easement for widening Van Ness Avenue	vol 8814 fol 874
17 Dec 1969	City of Sunshine	Part subdivision 5111 lot 7	easement for widening Van Ness Avenue	vol 8814 fol 875
3 April 1970		subdivision 5111 lot 5	Caveat withdrawn	
23 July 1971		14 Acres 1 rood half perch, subdivision 5111 lot 5	former Humes Quarry site	vol 8895 fol 075
15 Jan 1979		subdivision 5111 lot 5	Caveat withdrawn	
29 Dec 1978	Melbourne & Metropolitan Board or Works	subdivision 5111 Lot 6 part CAs 6 & 7 sec 21		vol 9323 fol 300