

# Say it with assemblages: A simple method for comparing sites

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*This paper develops a simple methodology for the analysis of artefact assemblages to enable comparisons between sites in a wide range of chronological and geographical contexts, from the early 'convict huts' of Parramatta to the most affluent sites of the late nineteenth century. First used on the excavation of a mining village at Cadia in Central Western NSW, the methodology has the capacity to provide comparative data on levels of affluence or on social and economic standing, also highlighting the key roles of literacy, marriage and children. The methodology is one layer of analysis among several standard techniques, but has the potential to provide powerful explanations of people's lives and decision-making when integrated with historical documentation.*

## INTRODUCTION

The combination of both historical and archaeological data provides wide ranging opportunities to investigate the human condition. Yet, while historical documentation is for many a tractable and fruitful resource, the same cannot be said of the archaeological evidence, particularly the large and seemingly intractable assemblages of artefacts recovered from urban or even rural sites. We all know that when dealing with 'domestic assemblages', it is often challenging to synthesise the artefact evidence from each site in a manner that makes a substantial contribution to historical archaeology and is also seen as an adequate return for the funding expended in salvage excavation. While differing in its approach and outcomes, the Exploring the Archaeology of the Modern City project (EAMC, commenced in 2001) was initially motivated by similar concerns – '... Mayne and Murray were interested in finding a way in which we could tell the stories locked up in all those boxes of artefacts from urban sites in Australia'. The catalyst for that project was the Little Lon excavation (1996) in Melbourne, but was expanded to include Casselden Place (2002), also in Melbourne, as well as the results of the 'Big Dig', Cumberland and Gloucester Streets, The Rocks, in Sydney (Murray, T. et al. 2003: 114, 115, 125). The recent synthesis of Australian historical archaeology by Susan Lawrence and Peter Davies also indicates that substantial progress is being made with artefact analysis not only through contract archaeology, but also through well funded research programmes (Lawrence and Davies 2011: 251-325). However there remain challenges, particularly for salvage or rescue excavation, in formulating efficient and cost effective methods of extracting information from artefacts on a limited budget that can still be effectively used for comparative purposes.

For the author, the investigation of archaeological sites at Cadia in Central Western New South Wales provided the catalyst to compare and contrast the domestic assemblages from urban sites with those from rural and village sites in regional NSW (Higginbotham E. & Associates Pty Ltd. 2005a) (Figure 1). The result has been the formulation of a methodology for comparing assemblages between sites, further developed by the author through subsequent archaeological excavations of sites in Parramatta and Port Macquarie in NSW (Higginbotham E. & Associates Pty Ltd. 2005b; 2007; 2008; 2009a; 2009b). This methodology is simply based on the number of functions in each assemblage, but has the potential to provide a comparative scale of access to goods and services, or of affluence, as well as insights into the subjects of literacy, marriage and children. The

methodology can be easily adopted and adapted to provide a large body of comparative information which will assist in the study of current research themes.

## ACCEPTING THE CHALLENGE

In a recent editorial of the *Australasian Historical Archaeology*, in a volume devoted to the contribution of artefact analysis, Martin Gibbs stated that:

'... as a community of researchers we have failed to establish many of the fundamental structures which should underlay our endeavours. In particular I am speaking of the tools and frameworks which should allow us to compare sites, and in the context of this volume, the artefact assemblages recovered from within different sites.'

He further challenged the profession in this way:

'... it cannot be denied that comparative studies in Australasian historical archaeology are rarities, while a sustained application of a comparative structure across several studies is something that I have not seen at all. Could someone point out to me any instance where we have unambiguously and systematically stacked up the assemblages of a 'convict hut' against a 'free settler home' (or preferably several of each), or either of these against a 'gentry' house, or the servants' quarters associated with that house, or any of the shades beyond and between (such as 'aspirational ex-convict')? If anyone puts up their hand to insist that they have done this – and I would be happy to be proved wrong – I would also ask that they demonstrate the consistent analytical and comparative structures by which they achieved this, so that the rest of us can follow them. In theory the exploration of similarity or difference should be simple, although in practice I am not sure that anyone in Australasian historical archaeology has actually done it, and if they have they have been awfully quiet about it.' (Gibbs 2005:3).

The challenge is therefore to:

1. 'unambiguously and systematically' compare assemblages between sites of varying types.
2. demonstrate 'the consistent analytical and comparative structures' used, and
3. provide a 'simple' and straightforward approach.

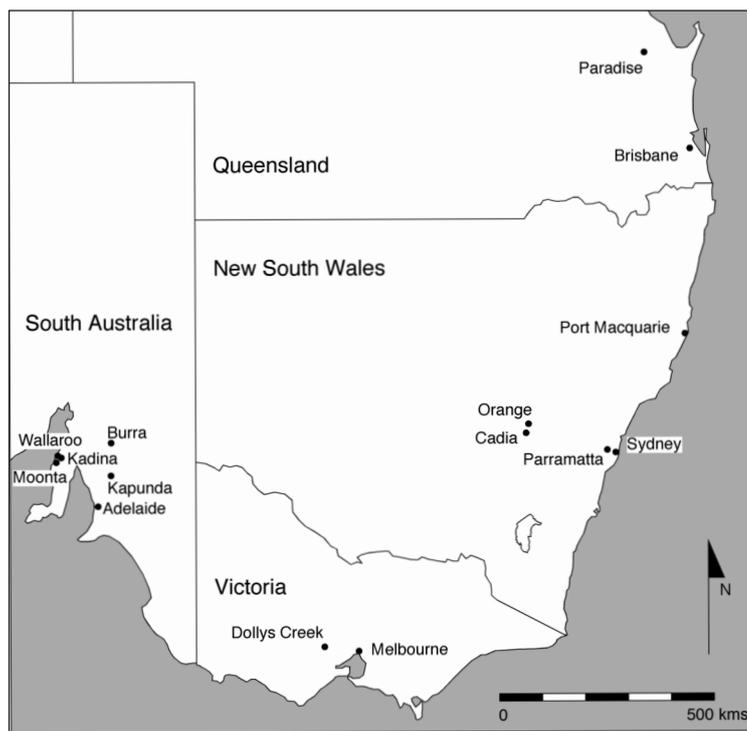


Figure 1. Plan showing the location of sites mentioned in the text.

The author recognises that this research has been confined to ‘grey literature’ for too long, but the methodology has taken a number of years to develop. From being initially frustrated at the limited findings that could be gleaned from basic artefact cataloguing and analysis from excavations completed during the 1990s (for example, Higginbotham E. & Associates Pty Ltd. 1991a; 1994; 1995a; 1995b; 1997, 2000), the author has been determined to confirm the value and application of the findings from the excavations at Cadia.

## A STANDARD METHODOLOGY FOR EXCAVATION REPORT PREPARATION

This section describes the basic foundations required to make use of the proposed methodology for comparative analysis of assemblages. In other words, here are the system requirements for running this program. All components should be installed before use in the field or laboratory.

It would be easy to say that we should follow ‘best practice’ in archaeological investigation and report preparation, but ‘best practice’ is an evolving and mutable concept, and so what one understands as best practice should be clearly articulated.

I suggest that the basic tenets for archaeological assessment, investigation and reporting are as follows:

1. Detailed assessment, including thorough historical research.
2. Comprehensive research design and permit application.
3. Methodical archaeological investigation.
4. Environmental sampling, as appropriate.
5. The recording and description of each context and unit using text, plan and photograph, sufficient to allow for the understanding and interpretation of the site (and indeed reinterpretation at a later date).
6. The cataloguing of artefacts, including description, quantities, date range and function.
7. Report preparation and synthesis of the results by the excavation director.

A detailed discussion of the above tenets is outside the scope of this paper, although a few comments are appropriate. Standards for artefact cataloguing have been outlined in a number of recent papers (Crook et al. 2002; Brooks 2005). It is appropriate that cataloguing methods and standards should improve over time. It is the responsibility of the excavation director to ensure that the artefact catalogue is prepared to a standard that is usable by future researchers without extensive, unnecessary and time consuming reworking of the data. It is also the responsibility of the excavation director to draw together all the evidence produced by an archaeological excavation in order to write a report that adequately realises the contribution of the site. The drawback of specialist reports on single artefact categories is that they are unable to assess the assemblage as a whole and cannot provide a holistic assessment of each context or phase. The responsibility therefore lies with the excavation director to do this, by using the whole artefact catalogue as well as all site records to bring together the results. A practical solution at the report preparation stage would be to divide cataloguing and specialist reporting (analysis) into two stages. The catalogue and other site records are then drawn together to ‘phase’ and date the site (see below).

This information is then fed back to the artefact specialist, who is then much better informed on the potential of the evidence to reveal information and meaning.

Some have almost accepted with resignation that artefact cataloguing and analysis is always going to be underfunded (Crook et al. 2002: 26, 28, 31). Yet it is often the case that the lack of funding is because an adequate budget has not been negotiated for cataloguing and analysis in the first place. There is also a need for the profession to decide what is the minimum standard of analysis for a salvage excavation report, an issue discussed in outline below.

### Detailed analysis for excavation report preparation

In the preparation of the final report (Item 7 in the list above), the first task is to draw together the information provided by the artefact catalogue and site records into one database. Once the artefact catalogue is produced by a number of artefact specialists, the only major adjustment before report preparation should be to ensure that all the data is consistent. Most important of all is to ensure that dating and function terminology is consistent across all artefact categories.

Brooks has argued that the Australian tradition of artefact cataloguing is based on the work by Judy Birmingham at Regentville and then on the American tradition, strongly influenced by Stanley South (Brooks 2005). However most consultants and artefact specialists in New South Wales use a methodology that is probably more directly based on the work of the Sydney Cove Authority (now Sydney Harbour Foreshore Authority) in the 1990s (Snelgrove 1990) or the Port Arthur Archaeological Procedures Manual (Davies and Buckley, 1987). This methodology has been updated and adapted by the author to meet the specific requirements of each site and also to support the proposed comparative analysis of assemblages.

The analysis of assemblages described in this paper has depended on the consistent use of function terminology for all the sites that are compared. This is essential because the findings depend on the total number of functions found in each assemblage. The latest version of the inventory of functions is therefore included in Appendix 1 (Table 12).

The second imperative for any excavation director is to correctly assess the date range of the artefacts in each phase or assemblage. To do this the artefact cataloguer should provide the date range of manufacture where possible, including the date ranges of particular patterns or types, where known. The more accuracy and detail in dating, the more evidence can be extracted from each assemblage. (It could be argued that the catalogue should record several date ranges, namely manufacture, introduction into the Australian market, and indeed time lag, but these issues are outside the scope of this paper (Adams 2003)).

The combined artefact and site records catalogue can then be used to 'phase' the site. Phasing simply means the grouping of contexts or units according to the four 'S's':

1. Structural evidence (buildings, wells, cess pits, etc),
2. Similarities and associations between features (groups of post-holes forming structures; layers in a cess pit),
3. Spatial information (rooms, yards and other spaces),
4. Stratigraphy and chronological similarities or sequences (deposits associated with construction, occupation and demolition)

Once this process is complete, the dating and functional analysis of each phase can be undertaken.

It is important to assess the date range indicated by artefacts, structural evidence and stratigraphy independently from other sources. Care should be taken to identify both residual and intrusive artefacts. The evidence should then be compared with the historical sequence of development to check how the archaeological dating confirms or refines the historical dating. Any inconsistencies between the archaeological and historical dating should be investigated and explained. While researchers may wish to identify time lag in artefact deposition (Adams 2003), a lack of consistency between historical and archaeological dating is also a primary indicator of potential sample bias in an assemblage and a warning to be wary in its use for further analysis. With few exceptions, small samples that do not provide a consistent date range are unlikely to provide a representative set of functions. In practice, it has been found that assemblages of less than 250 artefacts fall into this category and researchers should be wary of depending on results from these small assemblages, unless every effort has been made to account for possible sample bias (see for example, Higginbotham E. & Associates Pty Ltd. 2007, Vol. 3:19, 32, 121).

The functional analysis of each phase should proceed after the dating is completed. Bearing in mind the distinction between cataloguing and analysis (Crook et al. 2002: 29; Brooks 2005: 10-11) it is fundamental that the artefacts in each phase should be catalogued and described. But it is also essential that a level of analysis is included in every excavation report, not only for the adequate interpretation of the site, but also to complete the groundwork necessary to enable further research without extensive and time consuming reworking of the evidence. For all salvage excavations, a budget should be set aside for basic artefact analysis (dating and functional analysis), in addition to cataloguing. The budget should also include, where the evidence is suitable, the spatial analysis of the assemblages within and around structures, providing valuable information on the usage of rooms, yards and spaces, as well as the areas predominantly used by women and children.

The methodology outlined in this paper relies on the prior completion of this holistic analysis of the artefact catalogue.

### **A defence of functional analysis**

The recent debate on functional analysis reveals some fundamental misunderstandings of the use of typology and

classification in archaeology (see the critique by Crook et al. 2002; Brooks 2005). These misunderstandings relate to the primary intended function of cataloguing, as well as the idea that the catalogue should be the sole and complete repository of information on the artefacts.

The primary purpose of cataloguing in archaeology is not to put everything in its box in an archive, but rather to seek answers from archaeological evidence. All classification should be purpose built to assist understanding and seek explanation. The primary aim of classification is to elucidate meaning from each assemblage. The first question we might ask, either explicitly or implicitly, is what activities are revealed by the artefacts on each site? Our catalogues are built for this purpose, to extract this information. Hence we need to ascribe function in all catalogues. It is appropriate that we should be aware that each catalogue entry includes not only description, but also terms that *interpret* the artefact. It is appropriate to differentiate between form (description) and function (interpretation) (Brooks 2005:9; see also Crook et al. 2002: 30-31). But it is not appropriate to exclude interpretation (in this case, function) from a catalogue, because this defeats the whole purpose of classification in archaeology. It is certainly not an efficient approach for salvage archaeology, when the goal is to extract as much meaning as possible within available budgets.

Since salvage archaeology also has to efficiently interpret the basic information in the whole catalogue, in the first instance we should also choose terms that are applicable across the whole catalogue, rather than only part of it. Terms restricted mostly to ceramic or glass analysis can be used in later research, but at the stage of report writing for salvage excavation, the primary purpose of cataloguing should focus on elucidating the range of activities on a site, as well as other basic research questions regarding the roles of men, women and children. This is clearly not an exhaustive set of research questions, but the basic groundwork that is necessary to form the foundation for other research goals, without extensive reworking of the data.

It may be as simple as using function terminology like 'construction' rather than 'architecture' or 'building'. It is a much more inclusive term, which can include fencing wire as well as bricks and mortar. It is better 'to construct' than 'to architecture' (Brooks 2005: 7).

We should also be careful in using terms like *primary intended function* or *primary intended use*, which are not applicable for the whole catalogue. It would be difficult to place slag from copper smelting in either category, as it is a waste product. The principal requirement for the artefact catalogue is to recognise that the waste product of copper smelting is present on a site. This fulfils *the purpose* of the catalogue, *to reveal the activities that have taken place*. Elsewhere in the report, the industrial processes of copper smelting can be explained, as appropriate, and the reuse of the slag for road metallurgy or as a building material can be described. It is not necessary to burden the artefact catalogue itself with the multiplicity of functions or reuse, if these characteristics can be discussed elsewhere in the report. This is not to deny polyfunctionality, but to deal with the issue outside the artefact catalogue. We must remember that the catalogue is a tool to assist interpretation, but does not need to be the sole repository of all information relating to each artefact (above and beyond what are essential characteristics or minimum standards).

There is a need to be explicit in how we construct our artefact catalogues. If we also ask questions relating to gender and class, these questions should be made clear in the categories we use. Since we should have flexibility in our cataloguing systems, it may be appropriate to have multiple

fields to describe function, gender, class, etc, in order to clarify what we are trying to research and make it easier to extract the evidence (Brooks 2005: 9, 10). Anything that makes it easier to extract meaning, rather than confusion, should be encouraged. There is possibly an attempt among cataloguers to cram too much information into one function field. If several fields will relieve the congestion, these should be used.

Once it is understood that typologies and classifications should be purpose built, it should also be recognised that a rigid classification system is totally inappropriate. Archaeologists should therefore have no fear of adapting catalogues for a specific research purpose, adding fields or changing definitions. To limit ourselves in this regard would be to stifle research. But the point needs to be made: it is essential for the artefact catalogue from a salvage excavation, created within budgetary constraints, to comply with basic standards, so that it does not limit future research, interpretation and reinterpretation by requiring extensive reworking of the data (Crook et al. 2002).

### Function terminology – asset classes, key functions and functions

The methodology proposed in this paper relies on the above groundwork being completed to a high standard. If the methodology is to be used for the research purposes it is designed for, then it is necessary for the function terminology to be used consistently with each assemblage, to allow for comparative analysis. If researchers have other research questions, then they should be easily able to adapt the catalogue to their own research questions, because the foundations are completed.

To add new sites to this comparative database should not be a difficult task. Before final report preparation, it is necessary to check the artefact catalogue for consistent function terminology and have a separate field available in the database to record the revised function name, leaving the original terminology of the artefact specialist as a separate record. This is not a time consuming task. It can be done by any researcher for any assemblage and for any research purpose, providing the assemblage has already been catalogued to a high standard.

In providing a consistent function terminology, the author has allocated each function to a key function group. The 11 key functions are also allocated into three asset classes, which emphasize their role in assessing levels of affluence (Higginbotham E. & Associates Pty Ltd. 2005a. Vol. 3: 156ff; 2007, Vol. 3: 232ff) (See Appendix 1 for detailed information on the allocation of objects to functions and key functions) (Table 1). The three classes are:

**Capital Assets:** which represent real estate, and the improvements made on an allotment or household site. They belong to the owner of the property, but also reflect the standard of property that is affordable to a tenant.

**Disposable Income:** which comprise all the chattels, the ‘consumer discretionary’ and the ‘consumer staple’ items. More than any other category this represents levels of affluence and access to goods and services.

**Income Producing Resources:** which are those items that may be used in the obtaining of income, including the growing of crops (Husbandry), the use of various forms of transport (Transport), the tools of trade or industrial processes (Work).

This terminology has been formulated for a specific

research purpose, namely the assessment of levels of affluence or access to goods and services at a macro level, so it is appropriate to now briefly discuss research goals or research design.

**Table 1: Asset classes and key functions**

Asset Class	Key Functions
Capital Assets	Construction
Disposable Income	Containers
	Food
	Household
	Miscellaneous
	Personal
	Recreation Services
Income Producing Resources	Husbandry
	Transport
	Work

### Research goals

In their assessment of archaeological sites and assemblages, Murray and others have promoted an approach that brings together both the historical and archaeological evidence for each site. They have formulated a set of research questions that can be answered by excavation, analysis of assemblages and historical documentation, both for specific locations and larger geographical areas (Murray et al. 2003:114-117, 126-127). The Exploring the Archaeology of the Modern City project (EAMC) has chosen to examine domestic assemblages in the urban context and to ask research questions about the role of cities, not only in the movement of goods, but also of people.

Historical research on the biographies of individuals, families or groups lends itself to questions relating to migration, the movement of people and social mobility. Given that the settlement of Australia was largely the result of the social upheaval and dislocation caused by the industrial and agricultural revolution in the United Kingdom, it is appropriate to ask whether the decision to migrate, either forced or freely made, was ultimately a blessing or a curse in terms of life outcomes and descendants. In addition, the same question can be asked of the career and other choices or decisions made in the Australasian context to determine whether they had successful outcomes or not for the people concerned.

For example, for the period from 1788 to the 1840s in New South Wales, we might ask whether the choices available to the convict, the emancipated convict, the ‘native born’ and the ‘came free’ enabled them to take advantage of the opportunities available to them in the colonies or whether they were constrained by a lack of opportunity. We can adapt these same questions to a multitude of situations. In this paper the case study seeks to determine what choices were available, and what decisions were made by the migrant Cornish copper miners and Welsh smeltermen and their families at a mine site in Central Western New South Wales.

By integrating both historical documentation and archaeological data, historical archaeology has a fundamental and distinct contribution to make. These questions are answerable by the primary historical and archaeological evidence, provided we are prepared to let it speak. The methodology proposed in this paper is by no means the complete answer, but makes a contribution by providing a scale of affluence, or access to goods and services, that is objective and independent of the debate about class divisions. It supplies an independent

means of determining the success or otherwise of the decision-making described above. It also provides insights into questions of literacy and the roles of women and children, by providing thresholds for this type of evidence. In this context, threshold means the minimum number of functions in an artefact assemblage before evidence of literacy appears, or before the presence of artefacts usually associated with women or children.

Archaeological evidence for literacy is frequently provided by slate pencils and slate writing tablets, as well as by ink bottles. The former articles are usually associated with teaching children to read and write, but could also be used in the home or workplace for keeping tallies or records (for slates likely to have been used by adults in a domestic and industrial context, see Higginbotham E. & Associates Pty Ltd. 1991b: 166; Davies, P. 2005). Literacy was and is highly valued as an important factor leading to improved life conditions. It is therefore an important marker in the archaeological record. The question is can we correlate literacy and affluence in the archaeological record or is literacy more likely to be influenced by other factors, such as occupation?

The study of the 1828 Census of NSW reveals a population dominated by penal institutions and classifications. The population was heavily biased by convict transportation, so that for every female there were two males. Marriage was heavily skewed in favour of those men with property or a trade. The unskilled men had little chance of finding a partner, so that ultimately many died without issue (Higginbotham 1994:48-49). Although this population imbalance may have been redressed in the generation following the end of transportation in 1840, nonetheless marriage continued to require a certain level of income and is an important marker of successful outcomes in life choices and decision-making. But at what threshold do women and children become apparent in the archaeological record? Or, to rephrase this question, what is the minimum number of functions in an assemblage at which artefacts associated with women and children first present themselves?

In a society without social welfare, an accident, ill-health or unemployment could easily lead to poverty and starvation. Means of support in these circumstances were limited to family and relations, employee welfare mechanisms, unionism or occasionally the church or government institutions. Marriage was therefore a valued institution, not only for the rearing of children, but also to satisfy the requirements of support in times of need, by creating a group of relatives and in-laws.

**Table 2: Sites of buildings**

Buildings	Interpretation – usage
Building (W001) and associated buildings (W008, W009, W010, W011, W012, W013, W014)	Mine management – Chaplain's House or Underground Manager's House. Housing of senior staff at mine or chaplain and respective families.
Buildings (W005 and W006) Building (W002) and associated buildings (W003, W007, W015)	Industrial or agricultural use Domestic use – housing of mine employee and family.
Buildings (S005) and associated structures (S006, S007)	Bon Accord Hotel
Individual buildings (S002, S004, S008, S009, S011) and associated structures.	Miner's huts – accommodation for a miner and family or for groups of miners.
The Old Village Centre (S015-S020, S149-S155)	Shops and residences for shopkeepers

**Table 3: The principal characteristics of the Minor and Major Habitation Groups**

Minor Habitation Group	Major Habitation Group
Small buildings	Large buildings
Single structure	Multiple structures
Minimal development	Extensive development
Small artefact assemblages	Large artefact assemblages
Small number of functions	Large number of functions
Less capital investment (Construction)	More capital investment (Construction)
Less disposable income (Food, Household, Miscellaneous, Personal, Recreation, Services)	More disposable income (Food, Household, Miscellaneous, Personal, Recreation, Services)
Less access to income producing resources (Husbandry, Transport, Work)	More access to income producing resources (Husbandry, Transport, Work)

**Table 4: Sites belonging to the Minor and Major Habitation Groups**

	Construction	Container	Food	Household	Husbandry	Miscellaneous	Personal	Recreation	Services	Transport	Work	Total functions
<b>Minor Habitation Group</b>												
S002	9	2	9	3	0	2	9	2	3	1	6	<b>46</b>
S004	3	1	5	0	0	0	1	0	0	2	0	<b>12</b>
S008	1	1	5	0	0	0	1	0	0	1	0	<b>9</b>
S009	4	2	3	1	0	0	0	0	0	0	2	<b>12</b>
S011	10	1	7	0	0	2	1	2	0	5	4	<b>32</b>
<b>Major Habitation Group</b>												
W001	13	2	10	5	1	3	7	1	3	6	10	<b>61</b>
W002	13	2	11	6	1	5	13	2	4	8	13	<b>78</b>
S005	16	1	13	6	1	7	15	3	3	6	15	<b>86</b>
OVC	14	2	14	7	4	6	13	3	2	6	18	<b>89</b>

## CADIA, A CASE STUDY

The former mining village of Cadia is located 22 kms south of Orange in Central Western NSW (Higginbotham E. & Associates Pty Ltd 2005a) (Figures 1 and 2). Mining of copper commenced in the late 1850s and was strongly associated with migrant groups of Cornish miners and Welsh smeltermen. The mine ceased operation in 1868 with the collapse of international copper prices. Gold extraction became the focus of mining from 1870 onwards, with another boom in copper extraction from 1905–1917. From 1919 to 1928 iron ore was quarried before closure of the mine, with a brief resurrection of iron ore extraction during WWII. The mining village thrived from the 1860s, but waxed and waned with the vicissitudes of mining until the 1920s. By the 1940s insufficient of the village infrastructure survived, forcing Australian Iron & Steel to construct a work camp for its employees. The first burial in Cadia Cemetery took place in 1864, the last in 1927, neatly framing the life of the village, now abandoned (Higginbotham & Associates Pty Ltd 2002).

Archaeological investigation of part of Cadia Village in advance of goldmining by Cadia Holdings Pty Limited took place in 2002, covering a large area of the south-western or earlier part of the village (Figure 2). The importance of historical research of the lives of the inhabitants of Cadia Village was recognised from the outset, in order to provide a high level of integration of the historical documentation and

archaeological evidence. In fact over one hundred historical biographies had already been researched by Terry Kass for the 1997–1998 excavation of Cadia Cemetery, located a short distance to the south of the village site (Kass 2002). Before the Cadia Village excavation, this research was extended to include the history of the Cadia Village community, together with the role played by a significant number of Cornish and Welsh migrants (Kass 2005; Symonds 2004).

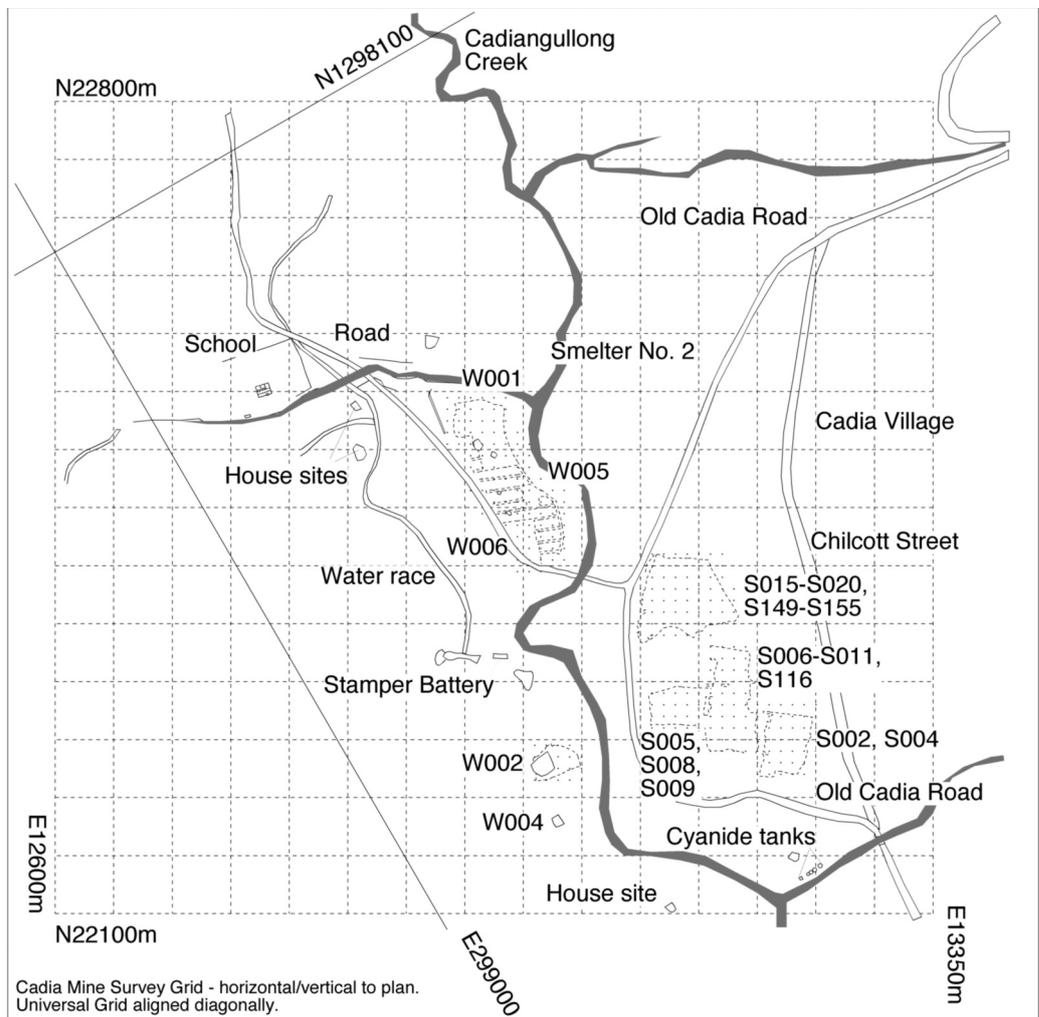
Within the south and western parts of the village, an area comprising approximately 180,000 square metres (18 hectares), various house sites were selected for archaeological investigation, based on a series of research questions (Higginbotham E. & Associates Pty Ltd 2005a. Vol. 1:183ff). The completed archaeological investigation allowed these structures to be grouped according to their principal use (Table 2). The results of archaeological excavation and artefact analysis enabled a typology of house sites to be formulated, dividing them into two habitation groups (Table 3). The analysis of the assemblages from each house site revealed

wide variation in the total number of functions represented within them, but with no overlap between the two habitation groups (Table 4). The dichotomy revealed by the structural archaeological evidence was thus confirmed by the mutually exclusive ranges of functions (Table 4). (Sites W005 and W006 are not included in this analysis, since they were industrial buildings with no domestic assemblage.)

### Minor Habitation Group

The Minor Habitation Group includes a range of huts, principally of post and timber framed construction (Table 5, Figures 2 and 5). The structural evidence and artefact assemblages confirm that these were the huts occupied by miners and their families, or by groups of miners sharing accommodation.

1865 – ‘Nearly the whole of the buildings on the ground belong to the Company, and they are let to the



**CADIA VILLAGE.**  
**Archaeological Excavations, 2002.**  
**Location of archaeological sites (W and S numbers).**  
 (Other features on west side of Cadiangullong Creek and to south of Village plotted by Carpenter Collins & Associates, surveyors, 1997. Topographic detail from aerial photograph, Land Information Centre, 1993).

Figure 2: Plan of Cadia Mining Village, showing principal features and areas of excavation.



men at very moderate rents. For an ordinary slab cottage, sufficient for a married man and his family, 4s. per month are charged; whilst single men who lodge together are charged 1s. per month.’ (*Sydney Mail*, 16 September 1865)

1868 – ‘upwards of 60 huts suitable for officers and workpeople’s residences, a few of the latter built of slabs with shingled roofs, the remainder of slabs and bark roofs.’ (French 2000)

The dating evidence suggests that buildings S002 and S004 may represent company huts built in the 1860s to 1880s, although the photographic evidence indicates that similar buildings were still being erected at a later date (Higginbotham E. & Associates Pty Ltd. 2005a Vols. 2 and 3).

Only two huts, namely S002 and S011, provided consistent artefact evidence of occupation by women and children. For all the other huts in the Minor Habitation Group, namely S004, S008 and S009, there is no artefact evidence of

occupation by females or children. On this basis the assemblage analysis suggests that a minimum of 32 functions is near the threshold for a level of income sufficient to support a wife and children (Table 4 – S011).

The low level of affluence implied by a limited range of artefact functions in some of the huts (S004, S008, S009) indicates that there were some miners at Cadia, who were not in a financial position to support a wife (Table 4). Other men may have been married, but may have left home to find work, living a frugal lifestyle in order to send their wages to their families. There is historical evidence that the women and children remained at Cadia when the mine closed in 1868, while the menfolk travelled to find work elsewhere. The families only removed themselves completely when the chances of reopening the mine appeared hopeless (Kass 2005:106-109). An archaeologist excavating a miner’s hut on the next mine site in this transition period could easily conclude it was a male dominated frontier settlement, and totally miss the status of the men as married with children.

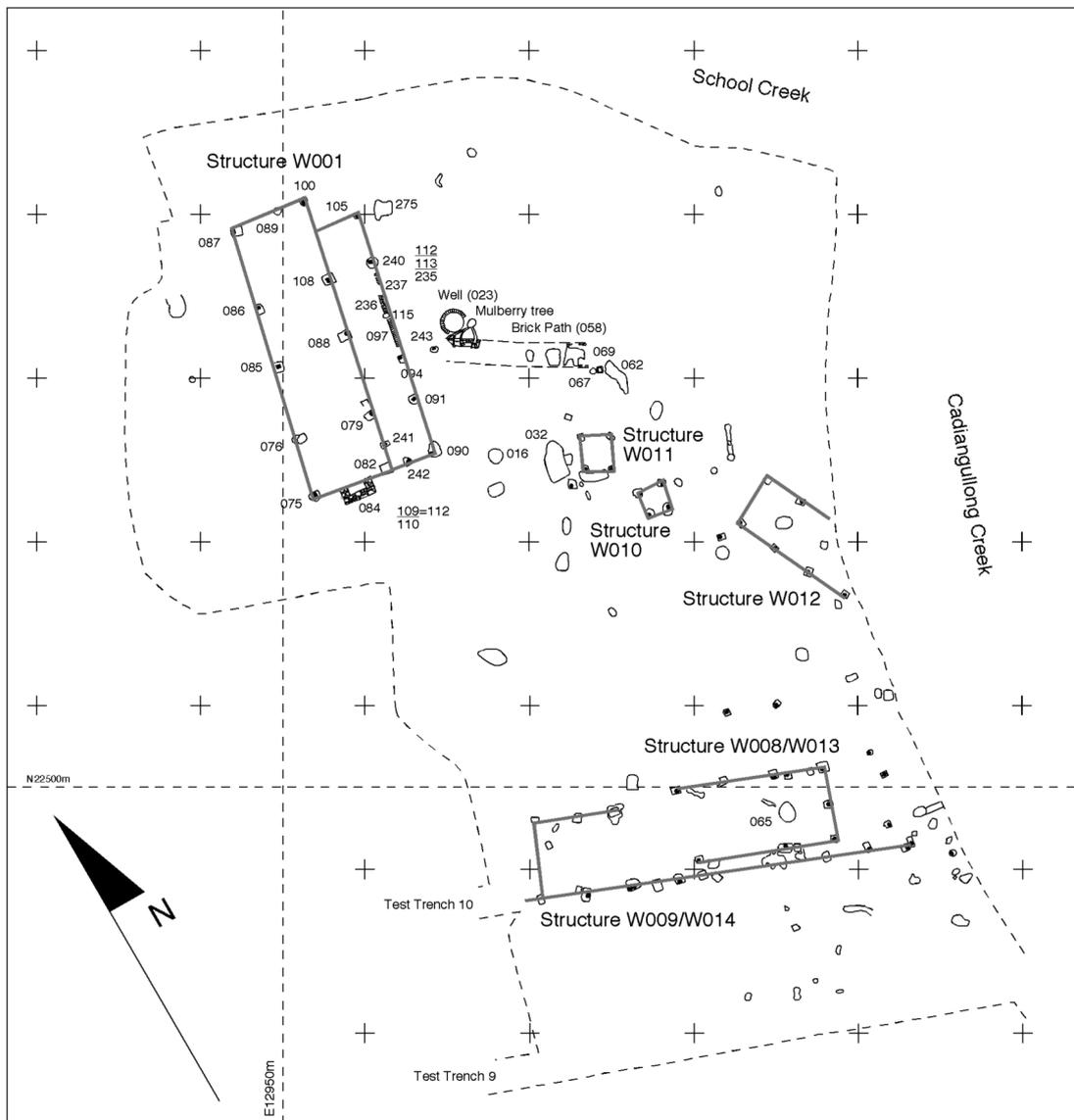


Figure 3: Plan of Chaplain’s House, later the Underground Manager’s Residence (W001) and associated buildings on the west bank of Cadiangullong Creek.

## CADIA VILLAGE - WEST VILLAGE.

Archaeological Excavations, 2002.

Building W001 (Chaplain’s House; Underground Manager’s Residence) and Structures W008/W014, W009/W013, W010, W011 and W012.

0

50 metres  
Edward Higginbotham & Associates Pty Ltd



Figure 4: Plan of buildings on west side of Cadiangullong Creek (W002, W007 and W015).

### CADIA VILLAGE - WEST VILLAGE.

Archaeological Excavations, 2002.  
Buildings W002, W003, W007 and W015.

Edward Higginbotham & Associates Pty Ltd

0 25 metres

Nonetheless there is one common element for all the occupants of the miner's huts, namely, absence of evidence for literacy. While some may argue that slate pencils and tablets are indicative of the education of children alone, there is ample evidence to suggest that this was also a basic writing material for adults as well (Higginbotham E. & Associates Pty Ltd. 1991b: 166; Davies 2005). If there is no evidence for children on a site, there is thus no need to suggest there will be a similar absence of writing materials. Even in the miners' huts where there is evidence of children, there is none for literacy. In contrast, all sites in the Major Habitation Group possess evidence for literacy. The importance placed on schooling by the Cadia community, as reflected by the petition for the school in 1863, should have benefited all the children of the village, yet the archaeological evidence suggests that this education did not necessarily include the poorest miners and their families, who may not have been able to afford the fees.

The evidence from Cadia therefore reveals that even among the miners there were people with a range of means

and incomes. The better off miners had brought their families with them, though there are still distinct differences in the level of domestic comfort indicated by the assemblages from S002 and S011. The limited number of functions in the assemblages for S004, S008 and S009 provides a stark measure of the poverty and disadvantage of some of the miners.

### Major Habitation Group

The range and variation in means and income indicated by the artefact assemblages for the Minor Habitation Group provide even greater contrast when compared to the Major Habitation Group (Table 4). Each site comprises a range of structures (Table 6). The sites in the Major Habitation Group all exhibit a higher total number of functions. In each case there is ample artefact evidence for women and children, as well as literacy.

The level of affluence indicated by mine management or the chaplain's residence (W001), namely 61 functions, is at

Table 5: Structural evidence for Minor Habitation Group

Site sub-division	Name or function	Size (metric)	Area (square metres)	Construction technique
S002	Hut	6.6 by 6 ?	39.6 ?	Post and timber framing
S004	Hut	5.5 by 5.5 ?	30.25 ?	Timber framing on piers
S008	Hut	7 by 3.2	22.4	Post construction
S009	Hut	7 by 3.9	27.3	Post and timber framing
S011	Building	8.55 by 6 ?	51.3 ?	Post and timber framing



Figure 5: General plan of buildings and other structures on the east side of Cadiangullong Creek, in the south-west part of Cadia Village. The concentration of buildings (upper left) is the Old Village Centre (OVC).

## CADIA VILLAGE - EAST VILLAGE.

Archaeological Excavations, 2002.

Structures S002, S004-S009, S011, S015-S020, S149-S155.

0 50 metres

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the lower end of the number of functions for the Major Habitation Group, in contrast to 46 functions being the maximum exhibited for the Minor Habitation Group (Table 4, Figures 2 and 3).

The group of small buildings (W002, with W003 and W015), with its various additions and alterations, was originally interpreted as a miner's hut, to which additions had been made, possibly as the family grew (Figures 2 and 4). But the assemblage reveals that the occupants were among the better off at Cadia. The assemblage implies a miner with his wife and children, but it seems likely that he had a more responsible and more highly paid position at the mine because the number of functions in the assemblage equates with sites

associated with mine management (W001) and the more wealthy inhabitants of Cadia in the Major Habitation Group. Unfortunately his identity is unknown, because the individual tenants on company land are unrecorded.

Historical evidence suggests that building (S005), with its accompanying sheds, stockyard, toilet and rubbish dump was the 'Bon Accord Hotel', run by Humphrey Hicks (Figures 2 and 5). The high range of functions is to be expected in these commercial premises. The same is also true for the Cadiangullong Store and other retail premises in the Old Village Centre (OVC) (Figures 2, 4 and 5). On the basis of this evidence, the village entrepreneurs and innkeepers shared in the wealth available to mine management. The shared social

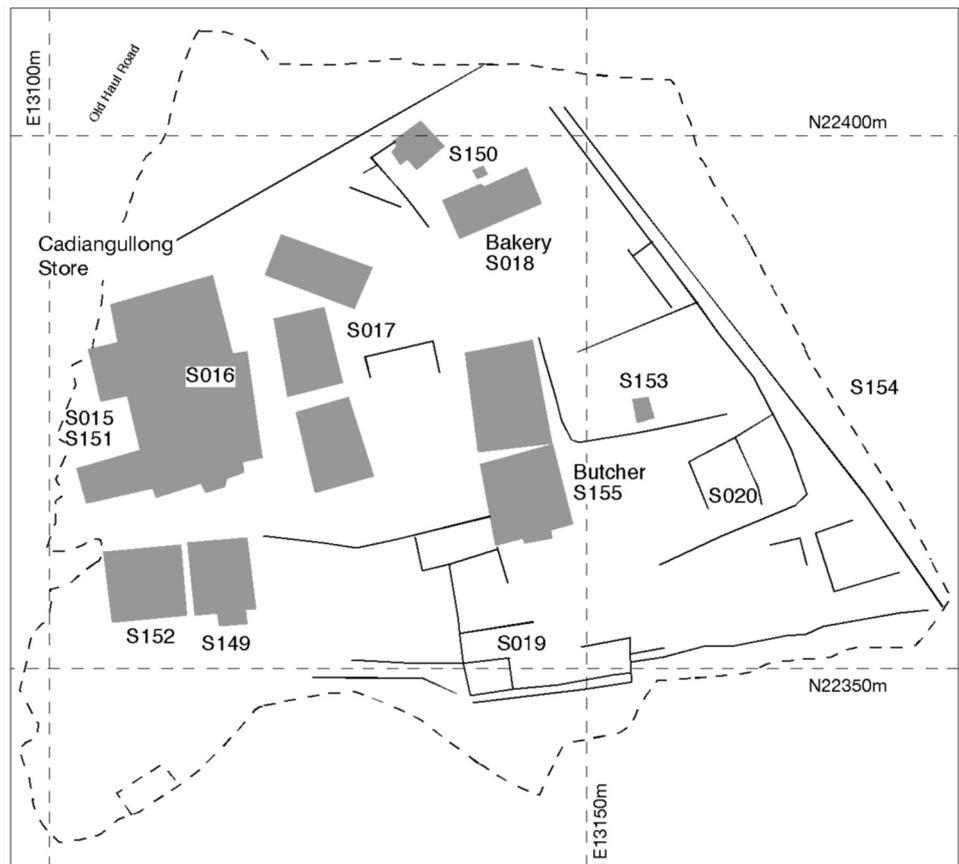


Figure 6: A simplified plan showing the buildings in the Old Village Centre (OVC), including the Cadiangullong Store (and Post Office), the butcher, the bakery and four other buildings, probably two conjoined shops and residences.

## CADIA VILLAGE - EAST VILLAGE (Old Village Centre)

Archaeological Excavations, 2002.  
Structures S015-S020, S149-S154.  
Showing buildings, fencelines and other structures.

0 50 metres

Edward Higginbotham & Associates Pty Ltd

standing of the mine management and entrepreneurs is further confirmed by the close family relationships between the two groups (Kass 2005:76-80, 85-87; Symonds 2004). The evidence from Cadia indicates that this mine site, though remote, was not a male dominated frontier settlement, but an integrated community.

The ability of integrated communities to thrive around the larger copper mining sites is incontrovertible, including examples such as Burra, Kapunda, Kadina, Wallaroo and Moonta in South Australia (Auhl 1986; Drew 1989, 1990, 1991, 2002; Drew and Jones 1992) (Figure 1). Though the village no longer survives, the same processes occurred at Cadia. Even at short-lived gold mines, like Paradise, Queensland, the brief flowering of a community has been demonstrated (Quirk 2008). It is perhaps more surprising at typical 'poor man's diggings', like Dollys Creek, Victoria (Lawrence 1998). Some workings, like Wire Gully, near Cadia, may never have spawned a settlement, but were worked by small groups or people from surrounding farms (Higginbotham E. & Associates Pty Ltd 2003b). Yet where an income could be made by both man and wife, sufficient to support a family, people chose to live adjacent to the mines in perhaps primitive, but nonetheless domestic surroundings.

This paper has demonstrated that it was not the women alone who provided domesticity, but a certain level of income that enabled the miner and his wife to purchase domestic chattels.

While the number of functions in the Minor and Major Habitation Groups appears to be mutually exclusive, further comparative analysis reveals that the social and economic data may have additional meaning. Prior to the excavation of Cadia Village, two other excavations had been completed on huts belonging to farmers, who took up land under the conditions of the 1861 Crown Land Alienation Act in the Cadia Village hinterland (Figure 1). This act allowed persons with few resources to purchase and improve small acreages of land. Both blocks of land were taken up in the late 1870s. The first, Portion 251, Parish of Waldegrave (200 acres), was known as 'Waringa'. The first house was built in 1879 and was occupied until 1886 or 1887, being then abandoned for a more favourable farm site on the neighbouring portion (Higginbotham E. & Associates Pty Ltd 2003a). The second was located on Portion 84, Parish of Clarendon, 100 acres, and was again taken up in 1879 by Henry Hunt, a former miner. The house continued in occupation until 1929 and became part of Tynan's slaughterhouse, which supplied Cadia Village with meat (Higginbotham & Associates Pty Ltd 2001).

**Table 6: Structural evidence for Major Habitation Group**  
(The table is limited to a catalogue of the living spaces, excluding ancillary buildings and structures.)

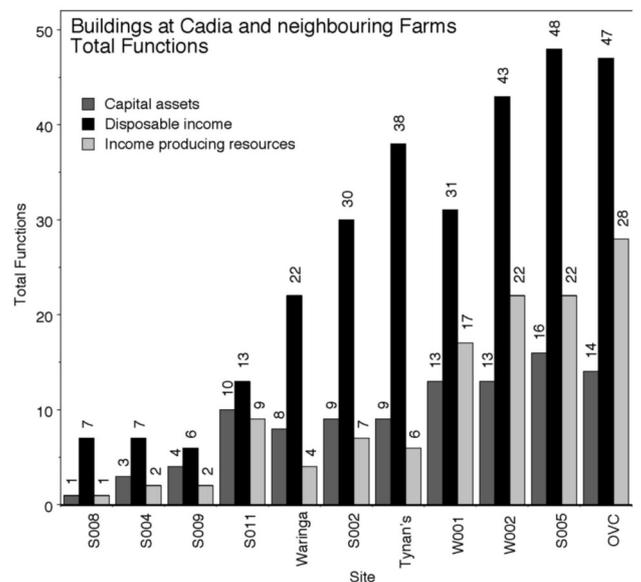
Site sub-division	Name or function	Size (metric)	Area (square metres)	Construction technique
W001	Chaplain's house/ Underground Manager's house	17.4 by 4.9	Total 127.82	Timber framing on piers Timber floor?
W001	Skillion	15.2 by 2.8		
W001	Fireplace	2 by 1.05		
W002	Hut	6.68 by 3.72	24.84 (total wattle and daub building = 47.62)	Post and wattle and daub
W002	Fireplace	1.2 by 0.95		
W007	2 rooms	3.36 to 3.76 by 6.4	22.78	Post and wattle and daub
W007	2 rooms	2.08 by 3.15 and 2.5 by 3.8	16.05	Timber framing
W007	Fireplace	1.05 by 0.8		
W003	Hut	7.1 by 3.7	26.27	Post construction
W003	Fireplace	1.4 by 0.8		
W015	Hut	3.76 by 2.5	9.4	Post and timber framing. Brick floor
S005 (1)	Building	15.6 by 3.5 ?	54.6 ?	Timber framing on stone rubble platform
S005 (2)	Building	–	–	Timber framing and possibly wattle and daub
S016	Building	19.35 by 8.75	169.31	Post and timber framing
S016 E	Fireplace	1.6 by 1.1		
S016 E	Skillion	11.2 by 2.8	31.36	Post and timber framing
S016 W	Awning or loading bay	5 by 2.8	14	Post and timber framing
S017 (1)	Building	8.2 by 5.2 ?	42.64 ?	Timber framing on stone rubble platform
S017 (2)	Building	6.5 by 4.6	29.9	Post and timber framing. Later cement floor
S017 (2)	Fireplace	2.7 by 0.8		
S017 (3)	Building	–	–	Post and timber framing
S018	Bakehouse	3.65 by 3.65	13.32	Post and timber framing
S018	Bakers oven	4.08 by 3.4	13.87	Brick
S149	Building	6.75 by 5.5	37.12	Post and timber framing
S149	Fireplace	2.85 by 1.3		
S152	Building	6.6 by 4.7	31.02	Post and timber framing
S154	Building	–	–	–
S155 (1)	Building	7.7 by 7.1	54.67	Post and timber framing
S155 (1)	Fireplace	2.6 by 1.2		
S155 (2)	Building	9.7 by 7.05		Post and timber framing

**Table 7: Functional analysis of the sites at Cadia, including neighbouring farms**

	Construction	Container	Food	Household	Husbandry	Miscellaneous	Personal	Recreation	Services	Transport	Work	Total functions
S008	1	1	5	0	0	0	1	0	0	1	0	9
S004	3	1	5	0	0	0	1	0	0	2	0	12
S009	4	2	3	1	0	0	0	0	0	0	2	12
S011	10	1	7	0	0	2	1	2	0	5	4	32
<b>Waringa</b>	<b>8</b>	<b>2</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>34</b>
S002	9	2	9	3	0	2	9	2	3	1	6	46
<b>Tynan's</b>	<b>9</b>	<b>1</b>	<b>10</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>11</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>53</b>
W001	13	2	10	5	1	3	7	1	3	6	10	61
W002	13	2	11	6	1	5	13	2	4	8	13	78
S005	16	1	13	6	1	7	15	3	3	6	15	86
OVC	14	2	14	7	4	6	13	3	2	6	18	89

The assemblages for Tynan's and Waringa are slotted into the sequence for Cadia, now sorted by the number of functions (Table 7; Figure 7). Both Tynan's and Waringa belong to farmers making their first foray into property ownership under relatively generous government incentives. The implication is that an assemblage containing between 34 and 53 functions is characteristic of a person or family with the means to purchase property. This evidence has been confirmed by subsequent archaeological excavation as a threshold for property ownership (discussed further below). The evidence therefore reveals that a number of the miners and their families at Cadia may have had the means to purchase property, had they wished to do so. For example, the inhabitants of huts S002 and W002 would have been able to purchase land, on the evidence of the functional analysis. The same also applies to the mine managers, licensees of the Bon Accord Hotel and potentially also the proprietors of the Cadiangullong Store and other shops.

While social upheaval and dislocation were characteristics of the industrial and agricultural revolution, social mobility



*Figure 7: The assemblages from the farm sites (Waringa and Tynan's) bridge the gap between the Minor and Major Habitation Groups at Cadia and indicate the threshold of property ownership.*

was also a feature in the burgeoning growth of the middle classes during this same period. The evidence revealed by the assemblage analysis indicates that social mobility was not just a possibility, but was an opportunity actively grasped by the Cadia community (Kass 2005:112-115). The saying, ‘once a miner, always a miner’ (Knapp 1998:4) did not apply to them, for the inhabitants of the village frequently took advantage of the conditional purchase provisions to obtain land in the neighbourhood (Kass 2005). The independent scale of affluence produced by the assemblage analysis has the potential to reveal a greater level of understanding of the choices made by miners and villagers after the closure of the mine in 1868. Some were constrained to seek work on neighbouring or distant mines. Others chose to stay in Cadia Village, while others again managed to put down roots on the land through Conditional Purchase arrangements or other land purchases (Kass 2002, 2005; Symonds 2004).

### Comparative sites – a brief synopsis

Since the archaeological excavation at Cadia in 2002, this methodology has been extended to other sites. One of the foremost of these was 45 Macquarie Street, Parramatta (Allotment 16, Section 12, Parish of St. John) (Higginbotham E. & Associates Pty Ltd 2007) (Figure 1). Due to the depth of stratigraphy on this site it was possible to physically separate assemblages from the 1800s, 1820s, 1830s, 1840s, 1860s and 1880s. The 1800s assemblage belonged to the original ‘convict hut’ erected on the town allotment. The majority of historical archaeological sites in Australia have very shallow stratigraphy. In many cases, features belonging to the whole date range of occupation are cut into subsoil, so that only horizontal stratigraphic relationships are discernible. Occupation layers, if they exist, can sometimes be limited to a single layer or series of thin lenses, so that the separation of artefacts from one period of occupation from another becomes impossible or at least unreliable. Even with the favourable conditions found at 45 Macquarie Street, Parramatta, the common problem of the mixing of the assemblages of convict and later free occupation had to be overcome. The resulting 1800s assemblages (with and without intrusive artefacts) reveal a highly impoverished male-only existence (Table 8, Figure 8).

**Table 8: Functional analysis of assemblages – 45 Macquarie Street, Parramatta**

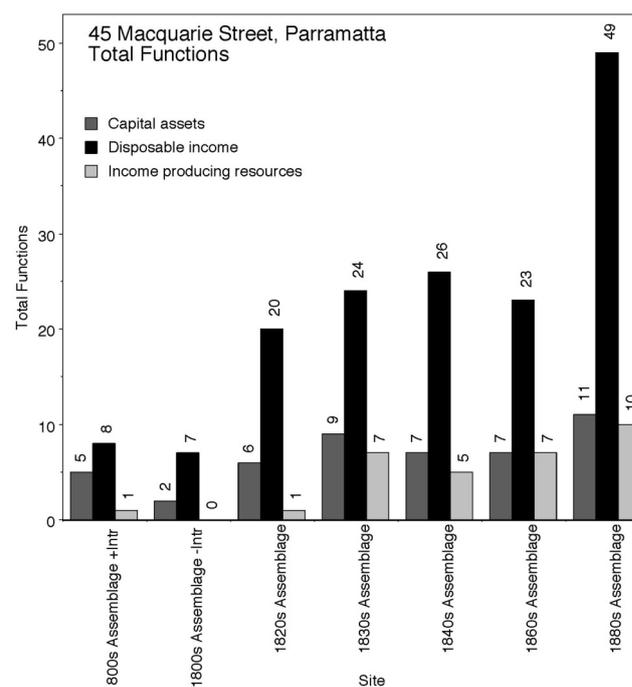
	Construction	Container	Food	Household	Husbandry	Miscellaneous	Personal	Recreation	Services	Transport	Work	Total functions
1800s Assemblage with intrusives	5	1	5	0	0	0	0	1	1	0	1	14
1800s Assemblage without intrusives	2	1	5	0	0	0	0	1	0	0	0	9
1820s Assemblage	6	1	7	1	1	4	4	2	1	0	0	27
1830s Assemblage	9	1	9	6	2	2	1	2	3	1	4	40
1840s Assemblage	7	1	8	5	1	2	4	3	3	1	3	38
1860s Assemblage	7	1	9	3	1	1	4	2	3	2	4	37
1880s Assemblage	11	2	11	11	2	3	11	3	8	3	5	70

This ‘convict hut’ was later used as a wheelwright’s workshop and residence, before being replaced by a brick cottage, directly after title to the land was secured by grant, which was purchased in 1841. The assemblage reveals social and economic stagnation in the situation of the owners of this household from the 1840s to 1860s. This was tied in with the death of John Walker (1799–1846), wheelwright, leaving his widow and children to cope as best they could with the loss of the main breadwinner for the family. They appear to have survived with a reasonable income, if the assemblage analysis is to be relied upon. They sold the property in 1875, after which the allotment was divided into two lots. The eastern lot was owned and occupied from 1879 by Samuel Sweeney, Parramatta, coachbuilder, with his coachworks further east on Macquarie Street. He was the person to whom the affluent assemblage of 70 functions appears to have belonged. He overreached himself in his affluent lifestyle, the house being sold by mortgagee sale in 1886 – not the last time this has happened on a site where this methodology has been tested.

The assemblage from 45 Macquarie Street has been compared with other sites in North Parramatta (Table 9) (Figure 1). All of the sites provided confirming evidence for thresholds for:

1. Literacy – reduced from 34 (Waringa) to 27 functions (45 Macquarie Street).
2. Women and children – reduced from 32 (Cadia) to 27 functions (45 Macquarie Street).
3. Threshold between the leasing and ownership of property – 34–53 functions.

The first two assemblages from North Parramatta belong to households where the property was owned, while the latter was tenanted from the 1830s to 1890s (Higginbotham E. & Associates Pty Ltd 2005b and 2009b). The assemblages from North Parramatta raise questions about the character of the area, where owners and occupiers seem largely to have been restricted to middle income levels throughout the nineteenth century. The numerous small cottages of the area, now conserved in the North Parramatta Conservation Area, suggest



*Figure 8: The assemblage from 45 Macquarie Street, Parramatta, indicates social and economic stagnation in the situation of the owners between the 1840s and 1860s.*

that the methodology of assemblage analysis may also be used as a pointer to the social and economic standing of localities, suburbs and even wider regions, as demonstrated below.

Further afield the methodology has also been tested on sites in Port Macquarie in NSW (Figure 1). The town

**Table 9: Functional analysis of assemblages – North Parramatta**

	Construction	Container	Food	Household	Husbandry	Miscellaneous	Personal	Recreation	Services	Transport	Work	Total functions
1831 cottage 50-50a O'Connell Street	10	1	10	4	1	3	7	3	5	0	3	47
Bakery 8-10 Grose Street	11	1	8	7	1	3	10	3	5	1	2	52
1830s cottage 21-23 Grose Street	12	1	9	6	0	3	9	5	3	2	2	52

**Table 10: Functional analysis of assemblages – Free Overseers' Cottages 2 and 3, School of Arts and Town Hall, at the Glasshouse, Clarence Street, Port Macquarie**

	Construction	Container	Food	Household	Husbandry	Miscellaneous	Personal	Recreation	Services	Transport	Work	Total functions
Cottage 2, 1820s-1830s	10	1	10	4	1	2	3	2	1	1	3	38
Cottage 3, 1820s-1830s	8	1	7	5	0	2	2	1	2	0	1	29
Cottage 2, post 1830s	6	1	6	3	0	2	2	1	0	0	2	23
Cottage 3, post 1830s	6	2	9	4	1	2	3	2	0	0	4	33
School of Arts, 1880s onwards	12	2	10	5	1	3	7	2	4	1	5	52
Town Hall, 1890s onwards	15	2	12	8	1	5	7	2	4	2	10	68

**Table 11: Functional analysis of assemblages – 18-20 Clarence Street, Port Macquarie**

	Construction	Container	Food	Household	Husbandry	Miscellaneous	Personal	Recreation	Services	Transport	Work	Total functions
Outbuildings to 1860s	15	2	8	6	2	4	10	3	4	1	7	62
House and back yard to 1880s-1890s	15	2	12	9	2	4	12	4	7	2	8	77
House to 1880s	15	2	12	8	2	4	10	6	5	2	7	73
Back yard to 1890s	14	1	9	6	1	3	11	4	4	1	6	60
Rubbish pit to 1880s	10	2	9	4	1	3	3	0	4	0	4	40

commenced its life as a penal settlement from 1821 until 1830, when allotments for the town were laid out and offered for sale. Some penal institutions continued until withdrawn in 1847, with convicts being used for public works. The assemblages from the Free Overseers' Cottages (Nos. 2 and 3) dating to the 1820s and 1830s, revealed an assemblage consistent with public officials, housed by government (i.e. at or below the range of 34–53 functions, the threshold between the leasing and ownership of property) (Higginbotham E. & Associates Pty Ltd 2008). The level of affluence of the occupants of these quarters did not improve in the post 1830s period, suggesting stagnation in the local economy, caused by the combination of the 1841 Depression, the end of transportation and the closure of the government penal establishment in 1847. The local economy did not recover until the 1860s, but flourished in the 1880s (Table 10, Figure 9).

The necessity of testing this hypothesis with other sites in Port Macquarie was answered by the recent excavation of 18-20 Clarence Street, a property that started its life as the Post Office for the penal settlement (1825–1830), and then become the house of Stephen Partridge, his wife and 11 children until 1852 (Higginbotham E. & Associates Pty Ltd 2009a). Partridge had served as Superintendent of Convicts from 1822 to 1830. He obtained the first liquor licence in Port Macquarie in 1830, became a constable in 1835 and was reappointed to his original position from 1836–1846. Of all the people in Port Macquarie, he would have been likely to weather the economic doldrums of the town, but he chose to take out a mortgage on his house for £257 at 8 per cent interest for a five year period in 1842. As with many people who entered the 1840s Depression with high debt levels, he too succumbed to a mortgagee sale in 1852. While he chose to maintain an affluent lifestyle, he could not escape the consequences of the financial crisis and appears to have lived beyond his means, as indicated by the large number of functions in the assemblage (Table 11, Figure 9). The prevailing economic conditions not only for the town, but the colony as a whole from the 1840s to 1860s, took their toll. In contrast, Henry Frederick Brown,

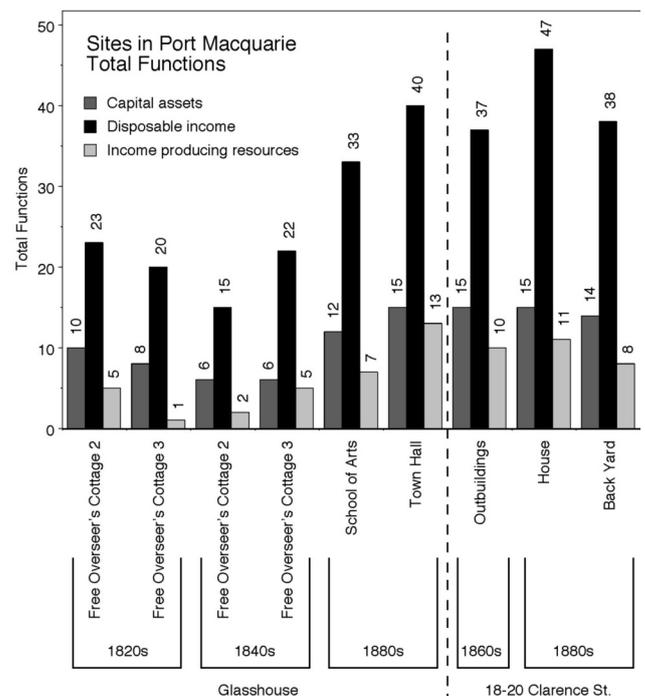


Figure 9: The assemblages from the Free Overseers' Cottages indicate economic stagnation in the 1840s. This is contrasted with the affluence of the owners of the house at 18-20 Clarence Street up to the 1860s and 1880s, a level of affluence not reached in the assemblages for the School of Arts and Town Hall until the 1880s and 1890s.

Chief Constable, purchased the property in 1859, just as the economy was showing signs of recovery. With secure employment, he was able to live a comfortable lifestyle (Table 11, Figure 9). The levels of affluence are similar to those indicated by the Town Hall and School of Arts in the 1880s and 1890s. It is interesting to note how these public buildings also possess domestic assemblages, the latter indicating that the School of Arts had become a centre of social and community life in the late nineteenth century (Table 10, Figure 9).

### Limitations of the methodology

The methodology outlined in this paper has a number of limitations in its usage. It requires extensive area excavation to ensure the recovery of large artefact assemblages. Each site also has to belong to a period where on-site garbage disposal is the norm. Those familiar with urban excavations in Sydney or Parramatta will readily acknowledge that off-site garbage disposal was introduced from the 1870s to 1890s.

Small sample bias must be considered as an important issue and potential detractor from the findings of this methodology. At Cadia Village, large assemblages of artefacts were usually present in fireplaces, cess-pits and rubbish dumps, though not always within each house. Providing an assemblage was available in one or more of these locations, it was considered a sufficient sample for functional analysis. Both S004 and S008 had features (rubbish dumps and cess-pits) which normally provided large artefact assemblages. The fact that they did not provide a large assemblage is therefore more likely due to the nature of occupation, rather than sample bias. Apart from S009, the small range and limited diversity of the assemblages for the remaining four sites in the Minor Habitation Group may actually reflect the nature of occupation rather than sample bias. This conclusion was assisted by extensive area excavation, which was more likely to recover places of garbage disposal had they been present.

It is also necessary to recognise when one or more households are potentially present in an assemblage. For example, it is highly likely that the Old Village Centre (OVC) at Cadia represents a number of premises, in addition to the Cadiangullong Store. Re-analysis of this particular assemblage would prove fruitful, though this does not affect the interpretation of the other households in the Major Habitation Group. In other instances, when ownership or tenants change, the assemblage has to be considered as the combination of the lifestyles of all occupants, unless the assemblage can be divided on a chronological basis.

Usage of this methodology has highlighted the potential for tracing changes in socio-economic standing over time, from the 1800s to the 1890s. When an assemblage is split up in a chronological sequence, there is a tendency for each phase to exhibit a smaller number of functions than present in the whole assemblage. Caution should be exercised when comparing a sub-assemblage of this type with the whole assemblage on another site. Likewise assemblages from individual rooms, yards and spaces have the same affect on the number of functions, limiting how these sub-assemblages can be compared with other sites.

There is a range of other sampling issues that should also be acknowledged, for example, the role of residual artefacts in multi-period sites; the possible proportional relationship or ratio between the numbers of artefacts and the number of functions and its influence on findings; or the general assumption that affluence increases throughout the nineteenth century. But comparative analysis has already revealed sufficient independence or divergence of the data from the expected results of these assumptions, in order to indicate that the methodology is providing valid results.

## CONCLUSIONS

This paper has identified some of the broad social and economic factors which had a critical impact on people's lives, particularly in regard to the case study of miners in the Central West of New South Wales. Comparative analysis with other sites in Parramatta and Port Macquarie, including an assemblage from a 'convict hut', has indicated that this methodology has wider application, showing how individual families coped with changing conditions and even providing evidence for the local or regional economy. This paper has shown that assemblages can be used to reveal incomes that allowed for education, marriage and children, the purchase of property, as well as lifestyles that had the potential to lead to financial ruin. It has indicated how people's circumstances changed over time.

The methodology relies simply on the total number of functions. It does not make a distinction between the social and economic implications of individual artefact types, for example, between utilitarian and luxury wares. This is an approach that should be used for broad comparative analysis, but also to focus and stimulate the more detailed research of artefact categories, typical of specialist reports or pure or applied research. It is therefore an appropriate level of analysis for the salvage excavation report, being the first stage of an ongoing process of investigation, research, interpretation and reinterpretation. This methodology is only part of the process, one layer of analysis among many.

While the primary focus of this paper has been on the analysis of assemblages, the structural evidence for social and economic status usually recovered from sites should not be ignored. It may not be appropriate to try and fit each site or household into a defined group such as the Minor or Major Habitation Groups recognised at Cadia, but the characteristics of each group should still be taken as guidelines for comparison. The actual floor space available in each habitation may be a more precise means of comparison between sites, though the more useful statistic of floor space available per person may be out of the reach of the available evidence, except when compared with census returns.

The methodology described in this paper, initially used to analyse the assemblages at Cadia Village, is a broad measure of poverty and affluence, comparable not only from household to household, but also from settlement to settlement. Although extensive historical research was completed for individuals buried in Cadia Cemetery and the growth and development of the Cadia Village community, there was no other source of documentation that was able to provide either clear evidence of poverty among the poorest miners or an indication of the comparative wealth of mine management or village businesses. These insights provide a potential for a greater level of understanding of the reasons behind the choices made by the miners and villagers after the closure of the mine in 1868 (Kass 2002, 2005; Symonds 2004). The single most important advantage of this methodology is that it provides a yardstick for poverty and affluence, a scale of access to goods and services, with key indicators for literacy, marriage and children, derived from the artefacts themselves. It gains further effectiveness through integration with known historical contexts, for example, rental or home ownership, and through integration with historical biographies and lifepaths.

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*Note:* All the excavation reports by Edward Higginbotham & Associates Pty Ltd referenced in this paper are available in the Library of the NSW Heritage Branch at Parramatta.

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## APPENDIX 1 INVENTORY OF KEY FUNCTIONS

The inventory includes key function, function and object descriptions (Table 12). The inventory is included in each excavation report, referenced in this paper, but has been updated where necessary for each site.

The terms 'Male', 'Female', 'Children' can be added to function names where there is a direct association with men, women or children.

The term 'Improvised' can be added to a function to indicate bush craft or the adaptation of items to serve other purposes.

In most cases, the function will identify the primary use. Any secondary use will be identified in the report, as required, when the identification of secondary or other uses adds to the ability to interpret the archaeological remains.

**Table 12: Inventory of Functions**

Key function and function names	Object names
Construction	This function includes all construction materials, but, where possible, is divided into specific categories, see below
Construction canvas tent or sail	Large eyelets for canvas materials, for example tents or sails
Construction decorative	Glazed tiles for bathrooms, fireplaces, etc. Paint finishes, etc
Construction door or gate	Door or gate hinges and fittings
Construction drainage	Items associated with stormwater drainage
Construction drainage or sanitation	Principally ceramic drainage pipes, which may be used for stormwater and/or sewerage.
Construction fastener	Clips, nails, spikes, brackets, pegs, rivets, studs, tacks
Construction fencing	Fencing wire and other fencing components, but not palings or posts, which are listed under Construction timber
Construction hardware	Principally metal items, the specific usage unidentified, including band, bar, cover, disc, offcut, piping, plate, ring, rod, tubing, wire
Construction improvised	Construction materials that have been hand made, representing bush craft or reuse of materials.
Construction industrial	Materials used in the construction of industrial buildings, furnaces, ovens, kilns, etc.
Construction masonry	Brick, stone, concrete
Construction metal sheeting	Galvanised iron or other iron, zinc, tin sheeting
Construction mortar and plaster	Plaster, mortar, render
Construction or household furnishing	Items which could be part of a building, household furnishing or other item of furniture, usually nails and screws, brass and other
Construction or work mechanical	Nuts, bolts, washers
Construction roofing	Roof coverings or fastener
Construction sanitation	Fitted toilet bowls, excluding chamber pots
Construction timber	Wood, worked, sawn, etc. Masonite, etc., fence palings
Construction window.	Window glass, sash weights
Container	Containers, use not specifically identified: bottles, containers, handle, jar, lead foil bottle tops, lid, rim, storage jars. Unidentified ceramic and glass fragments
Container barrel	Barrel hoops. Taps or spigots for barrels, usually brass
Container petrol or oil	Container for petrol or oil, oil can, petrol can
Container shipping	Shipping containers
Food aerated water	All aerated water containers, including soft drinks and ginger beer
Food alcohol	All containers of alcohol, for example, stout bottles
Food baby goods	Items used in baby food preparation or feeding

Key function and function names	Object names
Food container	Containers, sardine tins, fragments of food containers, ginger jars, storage jars or jugs, for food
Food debris	Bone and shell debris from food species
Food service appliance	Kitchen appliances, e.g. meat mincers, meat safes, water filters
Food service cooking	Cast iron cooking pots and other cooking containers
Food service cooking or household heating	Items used to cook food or heating of the household
Food service cruet	Salt and pepper dispensers, mustard etc.
Food service cutlery	All cutlery
Food service kitchenware	Basins, bowls, containers, handles, jars, jugs, lids, etc. Usually in cheaper or coarser ceramics, metal, etc.
Food service tableware	All parts of ceramic dinner sets, including food serving items. Glass bowls and other tablewares, principally clear glass, stemwares and tumblers
Food service tableware children	Tablewares associated with children, with alphabet, verses and pictures associated with children's stories See also recreation toy for children's toys and children's tea sets
Food service utilitarian	Enamel wares and other hard wearing food service wares, other than cooking pots (listed as food service cooking)
Food unidentified	Bone fragments, species not identified, but most likely food species
Household accessory	Items used in the household, not as appliances, but as accessories, for example, a stand for an iron, fire iron, coat hangers
Household appliance	Appliances
Household collectible	Items collected for their intrinsic beauty, rather than usefulness, including, shells, non-edible species.
Household furnishing	Household furnishing, other item of furniture, including fittings, mirror glass, floor coverings, linoleum, etc.
Household heating	Fireplace ironwork
Household maintenance	Blacking bottles, polish, laundry blue, clothes pegs
Household ornamental	Vases, ornaments and other household decorative items
Household pet or animal	Bone from cats or dogs and other objects associated with pets, including bird cages
Household poison	Usually cobalt blue glass bottles
Household timekeeping	All component parts of clocks, but not watches
Household toilet	Chamber pots, wash basins and bowls, wash jugs. Excluding fitted toilet bowls
Household vermin	Rodent bones, rat or mouse traps
Husbandry farming	Items associated with farming, including, ceramic eggs to induce hens to lay eggs, ploughshares, branding irons, cow bells
Husbandry fishing	Items used in fishing
Husbandry horticulture	Items associated with horticulture including basins, bowls, plant pots in coarse earthenwares or terracotta. Where fine earthenware or similar, place in Household ornamental
Husbandry hunting or trapping	Rabbit trap
Misc clerical	All stationery items, excluding writing materials. Glue bottles, paper scissors, magnifying glasses.
Misc clerical writing	Writing materials, including penny ink bottles, slate pencils, slate tablets
Misc commercial media	Newspaper, printing equipment, typesetting, TV aerials
Misc commercial merchandising	Labels, brand names and signs for the marketing or advertising of goods
Misc economic	Coinage, tokens used as currency
Misc firearms	Items used in combat or hunting including musket balls, cartridges, gun flints
Misc government or administration	Items associated with government administration or public office. For example, seals, mayoral insignia, ceremonial robes of office bearers
Misc government penal	Items associated with penal administration and imprisonment. For example, shackles and leg irons.
Misc human skeletal	Human bone or teeth
Misc measurement	Weights and measures
Misc natural	Items not altered by man, including roots, branches
Misc natural fauna	Native animals, if not used for food
Misc packaging	All packaging materials, including foil, plastic, foam
Misc scientific	Scientific instruments, telescopes, etc.
Misc scientific photography	All items associated with photography
Misc security	All items associated with the security of property, including latches, bolts, locks, keys, padlocks, window locks, escutcheon plates
Personal accessory	Personal accessories, including belt buckles, handbags, purses, suitcases
Personal clothing	Items of clothing, including buttons, studs, cloth or fabric, eyelets, hooks, studs, safety pins, hat pins
Personal cosmetics	All containers of perfume and other cosmetics
Personal dental	Dentures
Personal footwear	All component parts of boots and shoes
Personal jewellery	Items of jewellery. Note that glass beads may also be used in cloth covers for jugs and bowls
Personal medicine	Pill boxes, medicine bottles, phials, tubes, syringes and other medicine containers
Personal medicine or cosmetics	Objects with a medicinal or cosmetic use
Personal medicine or toilet	All containers of medicines or toiletries, excluding perfumes or cosmetics
Personal military	Items of military uniform
Personal optical	Spectacles and lenses
Personal religion	All items associated with religious beliefs, including icons, rosaries, Chinese tear bottles, Christmas decorations
Personal timekeeping	All component parts of watches and fob watches
Personal toilet	Personal toiletries, excluding perfume. Including combs, toothbrushes, hand-held mirrors, razors
Personal trophy	Plaques, cups, medals and trophies awarded for excellence in sport or other endeavour. Memorabilia associated with sports
Recreation game	Counters, dice, balls, quoits and other gaming pieces, not already included under Toys.
Recreation music	All component parts of musical instruments, including pianos and mouthorgans

Key function and function names	Object names
Recreation smoking	All tobacco pipes, of kaolin or other materials. Lighters
Recreation toy	Children's toys, including: marbles, children's tea-sets
Services battery	Batteries for torches and other items
Services electricity	All items associated with the supply and use of electrical items, including brass and copper wiring, electrical cables, conduits and fittings
Services energy	Gas piping, petrol containers
Services energy or water	Principally iron piping, which may be used for gas or water supply
Services fuel	Coal, coke, charcoal, burnt wood
Services lighting	Items relating to the provision of light, including glass covers
Services lighting arc	Items relating to arc lighting
Services lighting candle	All items associated with the provision of candle lighting
Services lighting electric	All items associated with the provision of electric lighting
Services lighting gas	All items associated with the provision of gas lighting
Services lighting oil	All items associated with the provision of oil lighting
Services telephony	Items associated with telephony, insulators of various types for telegraph wires
Services water	Water taps or piping, plug for sink
Transport	Items associated with vehicular transport, including parts and accessories
Transport automotive	Items associated with vehicular transport, specifically cars, trucks and buses
Transport bicycle	Items associated with bicycles, including parts and accessories
Transport equestrian	All items associated with horse transport, including horseshoes, horseshoe nails, harness
Transport equestrian draught	Horseshoes over 150 mm in diameter
Transport equestrian pony	Horseshoes less than 115 mm in diameter
Transport rail narrow gauge	Narrow gauge tramways and associated equipment
Transport vehicular	Buggy, trap, cart or other vehicles
Unidentified	Unidentified usage
Work blacksmithing	Iron slag
Work button manufacture	Button blanks, usually bone
Work copper assay	Crucibles for copper assay
Work copper smelting	Copper slag
Work flour milling	Grindstone
Work glassblowing by-product	Rupert's drops, a by-product of glassblowing
Work haberdashery	Items used in making or mending cloth or clothing, including pins, safety pins, thimbles, bobbins, scissors
Work leatherworking	Leather offcuts
Work mechanical	Items of machinery or other equipment
Work metalworking	Slags and other residues of metalworking. Note that slag-like materials may be produced in ordinary fires
Work metalworking lead	Lead solder, possibly for roofing. offcuts, mould trimmings
Work tool	Tools or other items associated with trades or employment. See also Work mechanical
Work tool blacksmith	Tools associated with blacksmithing
Work tool butchery	Butcher's hook
Work tool chain	Chains and links, pulleys, block & tackle, hooks
Work tool copper smelting	Tools used in the smelting of copper
Work tool improvised	Work tools that have been hand made, representing bush craft or reuse of materials.
Work tool labouring	Tools used in labouring, picks, mattocks, spades, shovels
Work tool leatherworking	Tools associated with leatherworking, saddlery
Work tool mechanical	Tools used on machinery
Work tool metalwork	Hacksaw blades, used to cut piping, etc
Work tool mining	Tools associated with mining, gads, picks, mining picks, mattocks, etc.
Work tool regional	Tools of regional origin, for example, round bladed shovel – often referred to as a Cornish shovel, regional style of shovel in UK
Work tool sheep shearing	Shears
Work tool timber working	Axes, usually associated with working timber, as in timber getting, fencing, cutting firewood, bush construction, etc.
Work tool woodwork	Brass hinged ruler, drill bits
Work tool woodwork or blacksmith	Chisels, files, rasps, punches, used in woodwork or blacksmithing. Punches associated with leatherworking, see Work tool leatherworking
Work tool pharmaceutical	Pestle and mortar, porcelain, syringe, test-tube
Work ship or boat building and repair	Wrought brass nails, boat or ship fittings
Work tool horticulture	Forks, hoes, rakes, etc.
Work tool masonry or plaster	Trowels, etc.
Work sealing or whaling	Items used in the sealing or whaling industry