Under the Boards:
The Study of Archaeological Site Formation
Processes at the Commissariat Store Site, Brisbane

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Declaration
This thesis represents original research undertaken for the Bachelor of Arts Honours Degree at the University of Queensland, and was completed during 2002 and 2003. The interpretations presented in this thesis are my own and do not represent the view of any other individual or group.

Karen Jane Murphy
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Abstract

The study of archaeological site formation processes, although commonly undertaken in prehistoric sites, is only carried out in historical archaeological sites in a limited way. Understanding the processes which formed the archaeological record of a site is an important first step towards developing justifiable inferences about past behaviour and past societies regardless of the age of the site. This thesis identifies and examines the cultural and non-cultural processes that formed the archaeological record at the Commissariat Store, in Brisbane, Australia.

The history of the site, from its construction in 1829 as part of the Moreton Bay penal settlement to the present, is examined and the expected impacts and processes on the archaeological record are identified. The archaeological evidence from the salvage excavation of the site undertaken in 1978/79 is analysed to identify the cultural and non-cultural site formation processes.

This study identified the presence of the cultural formation processes of discard, loss, abandonment and re-use from an examination of the historical and archaeological evidence. Non-cultural formation processes at work in the site include faunalturbation, floralturbation, flooding and aquaturbation. This research also identified deficiencies in Schiffer’s model for identifying and categorising cultural formation processes. The activity of construction of the site’s drainage system did not clearly fit within a single type of formation process. Water as a formation agent is only discussed in the literature as a non-cultural formation process, while at this site water can be seen as a cultural formation process. This thesis demonstrates the value and importance of understanding site formation processes as a firm basis for future interpretation of the archaeology of the Commissariat Store site.
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CHAPTER 1 – INTRODUCTION

Introduction

In this thesis I identify and examine the cultural and non-cultural processes that formed the archaeological record at the Commissariat Store, in Brisbane, Australia. The Commissariat Store is situated on William Street, in the modern day Brisbane central business district, and is only one of two remaining structures in Brisbane constructed during the early 19th century Moreton Bay penal settlement (Figures 1 and 2). Constructed in 1829, the original frontage of the building faces the Brisbane River located directly across Queens Wharf Road. A salvage archaeological excavation was undertaken by the Queensland Museum on the deposits below the floorboards of the ground floor prior to renovations in 1978/79 and little post-excavation analysis has been undertaken. This Honours research therefore represents the first stage in understanding the archaeological record at the Store. The study of site formation processes, although commonly undertaken in prehistoric sites, is only carried out in historical archaeological sites in a very limited way. It is argued that the study of site formation processes is important in the understanding and interpretation of all archaeological sites, including those from historical periods.

Research Question and Aims

My research aims to answer the question: What cultural and non-cultural processes formed the archaeological record at the Commissariat Store, Brisbane? The general aim of the research is to improve the understanding of the archaeology of Brisbane through the study of formation processes at the Commissariat Store site. The specific goals of this research are:

- To identify the likely impacts of known historical events and uses of the Commissariat Store on the archaeological record;
- To identify and describe the processes which formed the stratigraphy of the site;
- To identify and describe the horizontal and vertical distribution of artefacts in the site;
- To identify the processes which created the distribution of artefacts in the site; and
- To evaluate the utility of applying the study of site formation processes to historical archaeological sites.
Figure 1: Map of the location of the Commissariat Store, William Street, in the present-day Brisbane central business district (Adapted from Telstra Corporation 2002).

Figure 2: The Commissariat Store from Queen’s Wharf Road on the river side of the building (Environmental Protection Agency 1992).
Rationale

The importance of studying site formation processes as a first step towards developing justifiable inferences about past behaviour and past societies was initially identified by Lewis Binford (1977; 1981; 1987) and Michael Schiffer (1972; 1975; 1976) and has since been supported by a range of authors including Connah (2003), Goldberg et al. (1993), LaMotta and Schiffer (1999), McGuire (1995), Reid (1995), and Tani (1995). As Connah (2003) states “we need to understand as fully as possible how the archaeological data that we recover came to be as we find it, before we use it to address the bigger issues.”

The study of site formation processes has been extensively taken up by archaeologists researching prehistoric sites, when compared to such research at historical archaeological sites. In reviewing published historical archaeological literature from North America, only a small number of researchers explicitly identify and assess site formation processes (e.g. King and Miller 1991; LeeDecker 1994; McCarthy and Ward 2000; Reitz 1994; Staski 1990; Stevenson 1982; Wheeler 2000). In the Australian historical archaeological literature, also, very few researchers specifically undertake the study of site formation processes (e.g. Birmingham 1992; Connah 1986; 1994; 2003; Davies 2002; Koppi et al. 1985; Lentfer et al. 1997; Ward et al. 1999), others only give cursory consideration to such processes (e.g. Casella 1997; Fredericksen 2001; Higginbotham 1987), while many fail to consider formation processes at all.

The main rationale of this thesis is to address this deficiency in the historical archaeological literature and discipline. This thesis is important for a number of theoretical, substantive, methodological and practical reasons. It makes a theoretical contribution to the understanding of the importance of studying site formation processes as a first step before making inferences and interpreting the archaeology of a site. It makes a substantive contribution to the knowledge and data about the Commissariat Store site in order for future research to be undertaken. It contributes methodologically in the use of both historical and archaeological data for the identification of site formation processes. Finally, it makes a practical contribution to data and information about the Commissariat Store site for education and interpretation for museum displays at the Commissariat Store and the Queensland Museum.
The Theoretical Framework

The explanatory approach of this thesis, is based upon Lewis Binford’s middle range theory, and Michael Schiffer’s behavioural archaeology. Binford (1977:6) identifies the problem of converting static observations about the archaeological record into statements of dynamics about past societies, and argues that the links between the statics and the dynamics occur in the “middle range”. Binford (1981; 1987) argues that these links must be understood first before any inferences can be justifiably made. Schiffer (1976) similarly identifies the issue of the processes, both cultural and non-cultural, which create the materials in static spatial relationships in the archaeological record. Schiffer (1972; 1975; 1976) identifies the archaeological context (Binford’s “statics”) and the systemic context (Binford’s “dynamics”), and argues that the transformation of materials between these contexts is effected by cultural and non-cultural formation processes of the archaeological record. As Schiffer (1983:696) states “the first order of business for the archaeologist is to identify the nature of the cultural and non-cultural formation processes that created a given deposit or set of deposits”. He further states that

…the importance of identifying formation processes before behavioural or environmental inferences are developed cannot be overemphasised. In far too many cases, the evidence used by an archaeologist owes many of its properties, not to past phenomena of interest, but to various formation processes (Schiffer 1983:697).

The importance of the study of site formation processes in order to develop better inferences from the archaeological record has also been identified by a number of other authors including Connah (2003), Goldberg et al. (1993), LaMotta and Schiffer (1999), McGuire (1995), Reid (1995), and Tani (1995). This thesis undertakes this first important step in identifying the formation processes at the Commissariat Store to enable future research to develop more detailed inferences about the behaviour of humans in the past.

Research Design

The research consisted of six stages designed to link the statics of the archaeological context of the Commissariat Store site with the dynamics of the systemic context which created them, and to identify the formation processes at work in the site:

1. Review of the theoretical literature relating to middle range theory and behavioural archaeology;
2. Review of the applied literature relating to the identification and study of site formation processes, the practical application of their study on archaeological sites, and the use of such studies in historical archaeology both in Australia and overseas;

3. Review of the history of the Commissariat Store site using both original and secondary sources, and identification of the likely impact of these events and activities on the archaeological record;

4. Reorganisation and processing of the archaeological data from the excavation of the Commissariat Store site, including the stratigraphy, features and artefacts;

5. Analysis of the historical, stratigraphic and artefactual data; and

6. Identification of the site formation processes present at the Commissariat Store site.

**Thesis Outline**

The thesis is presented in six chapters which address each of the aspects of the research design.

Chapter Two details the theoretical framework for the thesis and reviews the literature on middle range theory and behavioural archaeology and how this relates to the study of the archaeology at the Commissariat Store. This leads into the literature on the study of cultural and non-cultural site formation processes, including the importance of their study, detailed definitions of the types of processes, and methods for identifying the processes in the archaeological record. A review of the study of site formation processes in historical archaeological sites is also presented.

The third chapter reviews the known history of the Commissariat Store, presenting the related historical events and activities. It also identifies the expected impacts that these would have on the archaeological record, by looking at how the cultural and non-cultural processes are likely to appear in the archaeological context.

Chapter Four presents the data from the archaeological excavation of the Commissariat Store site undertaken in 1978/79. A number of issues with the archaeological data are explained, followed by an outline of how the excavation activities were undertaken. For the first time, a comprehensive, detailed description of the stratigraphy of the site is presented, identifying an important, atypical profile in one area of the site. The archaeological features are also outlined. A complete overview of data from the artefacts recovered from the site is also presented for the first time, including the classification of the data by material type and
object type. I then focus on five artefact classes and describe the assemblages, their attributes, and horizontal and vertical distribution in the site.

The analysis and discussion of the historical, stratigraphic and artefactual evidence is presented in Chapter Five and identifies the cultural and non-cultural site formation processes which have formed the archaeological record at the Commissariat Store site. The analysis of the data revealed four distinct analytical units and the formation processes are discussed in terms of these units. The discussion frames the formation processes in the terms identified by Schiffer, and identifies a deficiency in the ability to categorise all processes according to the types defined in the literature. A further concern is identified in the consideration in the literature of the role of water as solely a non-cultural formation agent. The chapter concludes with the presentation of an explanation of the formation of the site at the Commissariat Store.

Chapter Six provides a conclusion to the thesis and summarises the main findings of the research. It reviews the thesis in terms of the research goals and rationale, and provides suggested future directions for additional research.
CHAPTER 2 – LITERATURE REVIEW

Introduction
Due to the explanatory, rather than interpretive nature of this thesis the research is based upon middle range theory and behavioural archaeology. Behavioural archaeology, which developed from, and in response to, Binford’s application of middle range theory, includes, as one of its areas of focus, the study of site formation processes resulting from both cultural and non-cultural agents. The processes responsible for producing the archaeological record need to be identified and understood before any adequate inference of past behaviour and culture can be attained (Reid 1995:18). These processes, both cultural and non-cultural, that have occurred at the Commissariat Store site must be identified before any stories about the activities at the site and in the settlement of Brisbane can be told.

The Key Models

Middle Range Theory
Binford (1977) identifies the urgent need for building theory for archaeology, particularly in the area he calls middle range theory. He identifies two basic problems for archaeologists in how to get from contemporary facts about observations on the archaeological record to statements about the past; and how to convert static observations about the archaeological record into statements of dynamics about past societies (Binford 1977:6). The links that are required between the “statics” and the “dynamics” are the links that must be formed in the “middle range” (Johnson 1999:50). Binford (1981; 1987) argues that these links between statics and dynamics have to be understood before inferences from the statics to the dynamics can be justified. He argues that the use of middle range theory and research is “the only way to evaluate propositions that seek to link dynamics and statics in a controlled fashion” (Binford 1987:505). Middle range theory enables archaeologists to transform evidence into inference (Schiffer 1988:462) at both specific and general levels. The material remains found in the present function as evidence for specific claims about the past, such as the shape or use of a particular pot, to more general claims, such as the emergence of civilisation (Kosso 2001:62).
The use of analogy is seen as an essential tool in middle range research (Binford 1987:505; Tschauner 1996:5). Analogy is the use of information from one context – the present – to explain data found in another context – the past (Johnson 1999:48). This use of analogy and middle range theory is based on the uniformitarian assumption – that is, that conditions in the past were like, or analogous to, those in the present (Johnson 1999:54).

Binford (1981; 1987) sees middle range research as not only developing relevant laws of human behaviour, but also aiming at understanding cultural systems by identifying and isolating the organisational characteristics of these systems. He sees organisation as the determining and conditioning factor in the structure of behavioural processes, and that the archaeological record is the result of these processes (Binford 1987). The approach Binford (1987) proposes using to isolate the organisational characteristics of past systems is to set up a frame of reference based on general, uniformitarianistic knowledge to assist in recognising and understanding properties that have general relevance to human actions. Properties from the archaeological record are then compared to this frame of reference. Any discrepancy between the expectations produced by the analogy and the patterns found in the archaeological record are defined by Binford as “ambiguity” (Leone and Crosby 1987). These ambiguities should then be dealt with, rather than explained as exceptions, as they provide clues to the context of use and meaning for the case in question (Leone and Crosby 1987). Information from this case can then be used to shape or reshape general knowledge that was sought by the archaeological exploration in the first place (Leone and Crosby 1987).

The dynamics of past cultural systems can be identified by understanding the formation processes of the archaeological record (Binford 1981:200). The patterned residues are generated continuously by a living system and can reveal information about the organisation of past systems (Binford 1981:200). Binford (1977:7) argues that only by accurately understanding the formation processes of the archaeological record, using middle range theory, can reliable meaning be given to facts from the past appearing in the present. Figure 3 demonstrates how Binford’s middle range theory applies to this thesis in the study of the Commissariat Store site.
Figure 3: People have undertaken various activities in the Commissariat Store – the ‘dynamics’ of human behaviour. The archaeological deposit formed underneath the floor of the Commissariat Store – the ‘statics’ of the archaeological record. Middle range theory provides linking arguments between the past and the present.

**Behavioural Archaeology**

Behavioural archaeology has been described as a logical outgrowth and extension of Binford’s “new” archaeology and its focus upon middle range theory (McGuire 1995:163). However, it has since become more than an extension of the processual archaeology agenda to be an expanded program with new models of inference, a focus on the importance of the investigation of formation processes, and the development of behavioural theories (LaMotta and Schiffer 2001).

Schiffer (1976:4; 1995:251), one of the main proponents of behavioural archaeology, defines archaeology as the study of relationships between human behaviour and material culture in all times and all places. Behavioural archaeology is based on the study of behaviour, that is, the interactions between people and material objects (LaMotta and Schiffer 2001:14; Walker *et al.* 1995:5). Schiffer (1976:12) proposes behavioural archaeology as a solution to the problems arising from the three basic properties of archaeological data:

1. They consist of materials in static spatial relationships;
2. They have been output in one way or another from a cultural system; and
3. They have been subjected to the operation of non-cultural processes.
The questions that can be asked about the relationships and interactions between human behaviour and material culture form the framework of behavioural archaeology and consist of four strategies (Schiffer 1976:4) (Figure 4). Strategy 1 uses material culture that was made in the past to answer questions about the behaviour and organisation of past cultural systems (Schiffer 1976:5). This strategy asks descriptive and explanatory questions about past human behaviour and includes most activities that are traditionally regarded as central to prehistoric and historical archaeology (Reid 1995:16). Strategy 2 addresses questions about material culture of the present in order to define laws for the study of the past (Schiffer 1976:6). Strategy 3 looks at past material culture remains to derive behavioural laws to apply to past and present human behaviour (Schiffer 1976:7). Strategy 4 studies present material objects in ongoing cultural systems to describe and explain present human behaviour (Schiffer 1976:8). This thesis applies the first strategy in order to move towards a description and explanation of past human behaviour based on the material culture from the past at the Commissariat Store site.

Figure 4: The strategies of behavioural archaeology, based on Reid 1973, 1995 (LaMotta and Schiffer 2001:16; Schiffer 1976:4).

The ultimate goal of behavioural archaeology is defined by Schiffer (1995:251) as providing scientific explanations for variability and change in human behaviour. All sources of variability in the evidence from the historical and archaeological records needs to be understood and taken into account when inferring past behaviour (Schiffer 1995:251). In order to study this variability, the archaeological and systemic contexts of artefacts and places need to be distinguished (Schiffer 1995:252). Schiffer (1972:157) defines the archaeological context as “the materials which have passed through a cultural system, and which are now the objects of investigation of archaeologists.” Reid (1995:19) expands on this to define archaeological context as the archaeological record of the present, consisting of formal, spatial, quantitative, and relational properties of cultural and non-cultural items, which is perceived in the present by the investigator. The systemic context is described by
Schiffer (1972:157) as “the condition of an element which is participating in a behavioural system.” This concept is further clarified by Reid (1995:19) as being the behavioural system which once contained the material remains of the archaeological record. The systemic context is the living sociocultural system that has left a record of material objects and associations that are being perceived in the present, that research is seeking to reconstruct and explain (Reid 1995).

Variability is introduced into the archaeological record through cultural and non-cultural formation processes which distort systemic patterns as well as creating their own patterns (Schiffer 1995:252). The archaeological record is seen as having undergone a series of transformations from the time the materials were part of the behavioural system to the time they are observed by an archaeologist (Schiffer 1975). The transformations are effected by the cultural and non-cultural formation processes of the archaeological record (Schiffer 1975).

Schiffer (1975; 1976) provides a “synthetic model of inference” encompassing three sets of archaeological laws in order to deal with variability and justify inferences about the transformations of the archaeological record. The first two sets of laws – “c-transforms” and “n-transforms” – are used to model the transformations (Schiffer 1975; 1976). C-transforms describe the cultural formation processes of the archaeological record and relate the behavioural and organisational properties of a sociocultural system to the outputs of that system archaeologically (Schiffer 1975). N-transforms describe the non-cultural formation processes and relate to the interaction between culturally deposited materials and factors in the environment in which the materials were deposited (Schiffer 1975). C-transforms and n-transforms together provide the archaeologist with a way to model the processes which formed the archaeological record (Schiffer 1975). The third set of laws in Schiffer’s (1975; 1976) synthetic model are “correlates” which provide the basis for inferring behaviour from material culture. Correlates address the relationships between the behaviour and organisation of a sociocultural system, and the material culture and environment of that system (Schiffer 1975). These three sets of laws – c-transforms, n-transforms and correlates – form the synthetic model which enables archaeologists to explain aspects of the archaeological record (Schiffer 1975).
As Reid (1995) outlines, the first important step in behavioural archaeology research is in understanding the formation of the archaeological record. It is necessary to answer the “how” first, before moving on to the “where, when, what and why” of reconstructing and explaining past human behaviour (Reid 1995:17). Answering the “how question eliminates variability irrelevant to the examination and explanation of human behaviour” (Reid 1995:17). Figure 5 demonstrates how Schiffer’s concept of behavioural archaeology applies to this thesis in the study of the Commissariat Store site.

Figure 5: People have undertaken various activities at the Commissariat Store – in the systemic context. The archaeological deposit has formed under the floor of the Commissariat Store – the archaeological context. Cultural and non-cultural formation processes have acted between and within the systemic and archaeological contexts.

**Similarities, Differences and Problems**

A range of authors, including Schiffer and Binford themselves, have identified similarities, differences, and problems with the two key models of middle range theory and behavioural archaeology.

Both Schiffer and Binford clearly separate the systemic context (Binford’s “dynamics”) from the archaeological context (Binford’s “statics”) (Binford 1981; Schiffer 1985b). Both see the archaeological record as a “transformed and distorted image of past cultural systems and the linking of the two contexts the central problem of archaeological inference” (Tschauner 1996:7). Both also agree that complex and independent processes lead to variability in the archaeological record, and therefore can’t be taken at face value (Schiffer 1985b). They both agree on the importance of the strategies used for inference and the priority this places on
understanding the archaeological record (Binford 1981). The principles used in archaeological inference – Schiffer’s correlates, c-transforms and n-transforms, and Binford’s middle range theory – are both similar (Schiffer 1985b).

There are, however, a number of areas where there is disagreement between Binford’s and Schiffer’s models. Early disagreement between Binford and Schiffer arises over Binford’s description of the “fossil record” of past societies, as Schiffer disagrees that archaeological remains are a fossilised cultural system (Schiffer 1976:11). Schiffer (1976:12) argues that archaeological remains are “a distorted reflection of a past behavioural system” and that “the cultural and non-cultural processes responsible for these distortions are regular.” Binford (1981), in turn, completely disagrees with Schiffer’s notion of the archaeological record being “distorted”. He argues that even though inferences from the archaeological record about the past may be wrong or unjustified, this is not because the archaeological record is distorted but because of the misunderstanding of the relationships between the statics of the present and the dynamics of the past (Binford 1981:200). Issue is also raised about the view of formation processes being a “destructive force” against obtaining behavioural information from the archaeological record (Tani 1995). Tani (1995:232) argues that cultural formation processes actually leave significant information about behaviours in the archaeological record. He further proposes that cultural formation processes are actually behaviours which alter the state of materials in both the systemic and archaeological contexts (Tani 1995:232). Schiffer (LaMotta and Schiffer 2001:47) appears to have since moved away from the idea of all formation processes being “distortions to be controlled” to the idea that cultural formation processes need to be explained in terms of the related human behaviour.

Tschauner (1996) identifies disagreement about the scale and logical status of cultural formation processes. Binford sees formation processes as identical to the operation of the cultural system, while Schiffer splits cultural systems into individual processes with some independence from the cultural system as a whole (Tschauner 1996:8). Binford sees formation processes as the translation of the usual operation of a particular sociocultural system into archaeological remains (Tschauner 1996:8). Schiffer, however, takes a broader view seeing formation processes as being generalisable across various sociocultural systems (Tschauner 1996:8). Disagreement is also identified over the level of general theory, and the relationship between middle range theory and general theory (Tschauner 1996). Binford focuses on the organisation and basic adaptive properties of systems, while Schiffer focuses on individual events from which system properties can be derived (Tschauner 1996:9).
Binford argues that it is not individual behaviours or events that produce the archaeological record but is the product of long term institutions (Tschauner 1996:9). Binford sees middle range theory and general theory being developed together, with middle range theory being a testing device for general theory (Tschauner 1996:10). Schiffer, however, sees that a general model of behavioural change is not a general theory, and that behavioural archaeology is middle range theory as an end in itself (Tschauner 1996:10).

Other authors raise a range of problems and issues with both middle range theory and behavioural archaeology. Johnson (1999) raises issue with the concept of analogy used in middle range theory. He argues that analogy doesn’t prove or test anything and it can’t be known whether the uniformitarian assumption is actually correct (Johnson 1999:60). Additionally, Johnson (1999:61-62) argues that middle range theory fails to take into account the influence of cultural ideas on people’s behaviour in everyday activities which has an effect on archaeological deposition and should be considered when looking at the formation of the archaeological record.

Hodder (1986) also raises this issue of middle range theory failing to include individual people’s ideas, intentions and meaning, arguing that the concept of “agency” is essential for understanding past human culture. He further argues that Binford’s and Schiffer’s focus on the relationship between behaviour and material culture is lacking in that the relationship “depends on the actions of individuals within particular culture-historical contexts” (Hodder 1986:12). Therefore, Hodder (1986:12) argues that there is no “direct, universal, cross-cultural relationship between behaviour and material culture.” Taking a different view, Kosso (1991; 2001) argues that Binford’s and Hodder’s models are actually quite similar even though they are usually cast in opposition to each other. He proposes that although the content of their claims are different, their method of justification and the standard of objectivity is similar (Kosso 2001). McGuire (1995:166) also argues that behavioural archaeology fails to adequately deal with the human consciousness. He states that although behavioural archaeology has been successful in reconstructing behaviour through material culture, it has failed to explain human behaviour (McGuire 1995:166).
As Walker *et al.* (1995) outline, one of the main principles of behavioural archaeology is that the variation seen in artefacts and cultural deposits in the archaeological record is most directly the product of human behaviour, and not due to “culture”, mental states or adaptation. However, as LaMotta and Schiffer (2001:20) argue, behavioural archaeology does not see external variables (such as the environment) or internal states (such as ideology, values or attitudes) to be completely uninvolved in behavioural change. Instead, they see behaviour, including both people and objects, as a mediator between all ecological, social and cognitive processes (LaMotta and Schiffer 2001:20).

A number of authors raise the issue of the focus of middle range theory and behavioural archaeology on site formation processes. Raab and Goodyear (1984) argue that middle range theory as it is used in archaeology is too narrowly focused on site formation processes. Earle and Preucel (1987) argue that although the concern about the processes of archaeological site formation in behavioural archaeology is essential to resolving problems about inference, it has directed the focus away from constructing higher level theories of human behaviour. They suggest that a definition of behavioural archaeology should include a focus on decision making at the level of the individual (Earle and Preucel 1987:511). This will then incorporate the “description and explanation of spatial patterning to reveal the mechanisms of past decision making” (Earle and Preucel 1987:511). Schiffer (1983) agrees that there has been a focus in behavioural archaeology on formation processes, but argues that this is only in the short term. In the long term “an enhanced understanding of formation processes permits inferences about past phenomena that have a logical and scientific basis” (Schiffer 1983:697).

Since the early 1980s, many different ways of practicing archaeology have developed. These postprocessual or interpretative archaeologies focus on the importance of meaning and ideas, and the role of the individual in past cultures (see for example Hodder 1991; 1992; Johnson 1999; Shanks and Hodder 1998). Although these interpretative approaches have moved away from the explicitly scientific focus, they still rely on a strong explanatory and methodological base. This thesis focuses on that explanatory level as a first step towards interpretation of the Commissariat Store site.
Methods and Approaches

Importance of the Study of Formation Processes

As McGuire (1995:174) notes, the development of the study of formation processes has been one of the greatest contributions of behavioural archaeology. Behavioural archaeology insists on the need to investigate formation processes, which are seen as the major source of uncontrolled variables, in order to formulate improved models of inference (LaMotta and Schiffer 2001:16). The study of formation processes remains critical for developing better inferences, but also to help illuminate the organisation and change in behavioural systems of the past (LaMotta and Schiffer 2001:41). Schiffer has continually stressed the importance of studying and understanding the formation processes of the archaeological record. He states that identifying formation processes before either behavioural or environmental inferences are developed is of extreme importance, as archaeological evidence often owes many of its properties not to the past phenomena under study, but to various formation processes (Schiffer 1983). Schiffer (1985a) further argues that if formation processes are not taken into account, the research implicitly contains assumptions that formation processes have benign effects and that archaeological assemblages will be treated as systemic inventories. Other authors also point out the importance of the study of formation processes (e.g. Connah 2003; Goldberg et al. 1993; McGuire 1995; Reid 1995; Tani 1995). Goldberg et al. (1993:viii) however point out that despite the recognised importance of formation processes, there remains relatively limited numbers of studies explicitly designed to study them.

Formation processes can be divided into two basic types – cultural formation processes and non-cultural formation processes.

Cultural Formation Processes

Cultural formation processes are defined as “the processes of human behaviour that affect or transform artefacts after their initial period of use in a given activity” (Schiffer 1987:7). These processes deposit artefacts creating the archaeological record, retain items in systemic context forming the historic record, and make any subsequent cultural modifications of material in either record (Schiffer 1987:7).

Schiffer (1976) has identified four types of cultural formation processes based on the transformation of materials between and within the archaeological context (A) and systemic context (S). These are described below and outlined in Table 1.
Table 1: Types of cultural formation processes (based on Schiffer 1972; 1976; 1987).

<table>
<thead>
<tr>
<th>Process Type</th>
<th>Descriptive name</th>
<th>Specific processes</th>
<th>Specific sub-processes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S-A Processes</strong></td>
<td>Cultural Deposition</td>
<td>Discard</td>
<td>Primary refuse</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Secondary refuse</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Maintenance processes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loss</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ritual caches</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disposal/treatment of the dead</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Abandonment</td>
<td>De facto refuse</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Curate behaviour</td>
</tr>
<tr>
<td><strong>A-S Processes</strong></td>
<td>Reclamation processes</td>
<td>Reoccupation</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reincorporation/salvage</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scavenging</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collecting/pothunting</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Archaeological excavation</td>
<td>-</td>
</tr>
<tr>
<td><strong>A-A Processes</strong></td>
<td>Disturbance processes</td>
<td>Earth-moving processes</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surface disturbances</td>
<td>Trampling</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ploughing</td>
</tr>
<tr>
<td><strong>S-S Processes</strong></td>
<td>Reuse processes</td>
<td>Lateral cycling</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recycling</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Secondary use</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conservatory processes</td>
<td>-</td>
</tr>
</tbody>
</table>
1. S-A Processes

These processes transform materials from the systemic context to the archaeological context (Schiffer 1976) and are also known as cultural deposition (Schiffer 1987). Cultural deposition processes include the following:

- **Discard of primary or secondary refuse** (e.g. King and Miller 1991; Matthews et al. 1997; McKee 1999; Petraglia 1993; Ross 1985; Schiffer 1989; Tordoff 1979; Wheeler 2000; Wilk and Schiffer 1979). Primary refuse is considered to be artefacts discarded at their location of use, while secondary refuse is items discarded elsewhere, even if adjacent to the area of activity (Schiffer 1972:161; 1976:30; 1987:58). Discard can also be the result of maintenance processes, either on a regular or ad hoc basis (Schiffer 1987:64; South 1979) and include such examples as sweeping (Matthews et al. 1997:291), the maintenance of privies (Wheeler 2000:10) or simply the clearance of larger pieces of artefacts from an area for discard elsewhere (Nielsen 1991:497).

- **Loss**, where the object unexpectedly enters the archaeological context (Fehon and Scholtz 1978; Schiffer 1976:32; 1987:76).

- **Ritual caches**, where artefacts are ritually deposited by a society (Schiffer 1987:79).


- **Abandonment**, where an entire place is transformed to archaeological context (Schiffer 1987:89). Abandonment of a place can range from a rockshelter used in the Palaeolithic (Koetje 1993:117), to entire settlements (e.g. McKee 1999; Schiffer 1989; Webb 1995), to backyard privies from the 18th and 19th centuries (Wheeler 2000:11). The abandonment process sets in motion other processes including de facto refuse deposition, which consist of cultural materials which may still be usable, that are left behind when an activity area is abandoned (McKee 1999; Schiffer 1972:160; 1976:33; 1987:89). The other process at work during abandonment is curate behaviour, where items which are still usable or repairable are removed from the abandoned area for continued use in another location (Schiffer 1972:160; 1987:90).
2. *A-S Processes*

These processes transform materials from the archaeological context back to the systemic context (Schiffer 1976) and are also known as reclamation processes (Schiffer 1987). Not only can artefacts be reclaimed, but previously used places can re-enter the systemic context by being reoccupied (Schiffer 1987:100). The process of reclamation also involves reincorporation of abandoned artefacts into the systemic inventory (‘salvage’) (Schiffer 1987:103-104), the exploitation of previously accumulated deposits of artefacts by the occupants of the site (‘scavenging’) (e.g. Davies 2002:63; Schiffer 1976; 1987:106), and reclamation of materials, followed by removal to another location. Collecting processes involve the disturbance, removal and transport of surface materials, while “pothunting”, bottle collecting, metal detecting and other historic relic collecting, generally refers to subsurface materials (Ruig 1999; Schiffer 1976:35; 1987:114). In addition, archaeological excavation itself is a major type of reclamation process (Schiffer 1976:34).

3. *A-A Processes*

Materials may be transformed from state to state within the archaeological context (Schiffer 1976) and are known as disturbance processes (Schiffer 1987). These are different from reclamation processes in that the materials never really re-enter the systemic context, even though their location and form may be altered (Schiffer 1987:121). Disturbance processes need to be considered not only in light of cultural behaviour, but also environmental formation processes to which the disturbed materials may be subjected (Schiffer 1987:121). Earth-moving processes and other land-modification activities are a major factor in the disturbance of materials and can range from digging a pit (Van Nest 2002:61) to constructing a dam (Schiffer 1976:36; 1987:122). Surface disturbances occur while humans undertake various activities (Schiffer 1987:126). Two major processes of this type are trampling by people and their animals (e.g. Blackham 2000; Koetje 1993:118; Matthews *et al.* 1997; McBrearty *et al.* 1998; Nielsen 1991; Schiffer 1987:126, 129; Shea and Klenck 1993; Staski 1990), and ploughing for agriculture (e.g. Barton *et al.* 2002:164; Schiffer 1987:126, 129).
4. **S-S Processes**

These are processes where materials are transformed from state to state within the systemic context (Schiffer 1976), and are also known as reuse processes (Schiffer 1987). Lateral cycling is a reuse process where artefacts are transferred between different users, such as between individuals, or between social units, but where no change in the use of the object occurs (e.g. Ross 1985; Schiffer 1972:159; 1976:39; Schiffer 1987:29; Wilson 1995). A second reuse process is recycling, where the artefact is returned to the manufacturing process after a period of use (e.g. Davies 2002:63; McKee 1999; Ross 1985; Schiffer 1972:158; 1976:38; 1987:29; Wilson 1995). A third reuse process is secondary use, where an artefact takes on a new use without the need to be extensively modified, such as when use-wear, breakage or maintenance alters an artefact making it appropriate for another use (McKee 1999; Schiffer 1976:38; 1987:30). Conservatory processes are a fourth type of reuse process where an object’s use is changed so that permanent preservation is intended (Schiffer 1976:40; 1987:32).

**Non-cultural Formation Processes**

Non-cultural formation processes are defined as “any and all events and processes of the natural environment that impinge upon artefacts and archaeological deposits” (Schiffer 1987:7). These processes act on cultural materials at all times in both the systemic and archaeological contexts (Schiffer 1987:7). They determine what decays and what is preserved, and they include the collapse of structures, the accumulation of sediments, a wide range of disturbances, and the deposition of evidence of past environments (Schiffer 1987:7). Non-cultural formation processes have four basic characteristics – the nature of the process (i.e., chemical, biological or physical), the duration of the process, the additive or subtractive effects of the process, and the scale of the effects (Rathje and Schiffer 1982).

At the artefact level, there are three main agents of deterioration – chemical, physical and biological processes (Schiffer 1987) – which can affect all types of artefacts from bone (e.g. Andrews 1995) to shipwrecks (e.g. Ward *et al.* 1999). Each of these processes causes different rates of deterioration and different effects depending upon the substance of the artefact itself (Schiffer 1987). Stone, ceramic, glass, metals and organic materials all react in different ways to environmental processes (Schiffer 1987).
Larger scale effects occur at the site level with the major factor to be studied being soils and sediments. Sediment can be deposited at a site through a range of processes including wind and water (e.g. Brown 1997:91; Frederick et al. 2002; Matthews et al. 1997; Van Nest 2002:57-58). Once deposited, sediments can also be transported and redeposited within sites depending on the local topography, the nature of the sediments themselves and the presence of flowing water (Schiffer 1987). After being deposited, by either cultural or non-cultural processes, sediments can be further changed and affected, with soil horizons altered and particles, including artefacts, moved (Schiffer 1987). The variety of processes which mix the soil and sediment are known as pedoturbation (Wood and Johnson 1978:317). Table 2 outlines nine processes which fall under the category of pedoturbation. Not only are soils and sediments subject to environmental processes, but complex artefacts such as pits and structures, are subject to forces of deterioration and in turn may lead to the deposition of sediments (Schiffer 1987:218).

Processes which occur on the regional scale may also have effects at the site level. These include the seismic action of earthquakes (Schiffer 1987:231-234), and the effects of wind and water brought about through storms and flooding (Turnbaugh 1978). Regional level formation processes are principally influenced by climatic factors, consisting of temperature, precipitation and wind; and geological factors, including minerals, rocks and landforms (Barton et al. 2002:162-163; Schiffer 1987:235-236). Specific regional processes include volcanism, eolian processes, geomorphological processes, the effect of vegetation and fauna (Schiffer 1987) and hydrological processes (including the effects of ground water, lakes, glaciation, colluvial and alluvial processes, erosion and coastal processes) (e.g. Petraglia and Potts 1994; Schiffer 1987; Walker et al. 1997).

**Identifying Formation Processes**

The unit of analysis appropriate for identifying formation processes is the deposit. Schiffer (1987:265) defines a deposit as “a three-dimensional segment of a site (or other area of analytical interest) that is distinguished in the field on the basis of observable changes in sediments and artefacts.” Although it is common practice, viewing the deposit as a single discrete depositional event or process has its problems, as a single depositional process can give rise to materials in different deposits, and conversely, a single deposit can contain the products of many different depositional processes (Schiffer 1987:266). Despite these issues, a variety of formation processes can be identified through the traces of evidence they leave.
Table 2: Types of pedoturbation processes effecting soils and sediments (based on Wood and Johnson 1978:318)

<table>
<thead>
<tr>
<th>Process</th>
<th>Soil-mixing vectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faunalturbation</td>
<td>Animals - including burrowing mammals, crayfish, ants, termites and other insects, and earthworms (e.g. Balek 2002; Blackham 2000; Bocek 1986; 1992; Erlandson 1984; Grave and Kealhofer 1999; Matthews et al. 1997:291; Petraglia 1993; Stein 1983; Van Nest 2002)</td>
</tr>
<tr>
<td>Floralturbation</td>
<td>Plants - including root growth and treefall (e.g. Balek 2002; Grave and Kealhofer 1999; Matthews et al. 1997; Van Nest 2002:60)</td>
</tr>
<tr>
<td>Cryoturbation</td>
<td>Freezing and thawing</td>
</tr>
<tr>
<td>Graviturbation</td>
<td>Mass wasting - including subsidence, avalanche and soil creep downslope (e.g. Koetje 1993:115; Rick 1976; Van Nest 2002:75)</td>
</tr>
<tr>
<td>Agrilliturbation</td>
<td>Swelling and shrinking of clays</td>
</tr>
<tr>
<td>Aeroturbation</td>
<td>Gas, air and wind (e.g. Frederick et al. 2002; Matthews et al. 1997)</td>
</tr>
<tr>
<td>Aquaturbation</td>
<td>Water - including artesian action on soils (e.g. Brown 1997; French and Whitelaw 1999; Van Nest 2002:57)</td>
</tr>
<tr>
<td>Crystalturbation</td>
<td>Growth and wasting of salts in soils</td>
</tr>
<tr>
<td>Seismiturbation</td>
<td>Earthquakes</td>
</tr>
</tbody>
</table>
These traces can be determined by looking at attributes of artefacts and characteristics of deposits (Schiffer 1987:67).

Some simple properties of artefacts can be used in identifying the traces of formation processes. Artefact size can be a result of formation processes, reducing the size of artefacts, or sorting artefacts by size (e.g. Blackham 2000; Dibble et al. 1997; Nielsen 1991; Petraglia 1993; Petraglia and Potts 1994; Robins 1999; Schiffer 1987:267; South 1979; Staski 1990; Van Nest 2002:62). The density of an artefact may also affect its movement by water, air or gravity with such processes sorting artefacts by their density (e.g. Dibble et al. 1997; Rick 1976; Schiffer 1987:269). The effects of wind and water will also sort artefacts by shape, given constant size and density (Schiffer 1987:270). Water, and sometimes wind, can align artefacts along their long axes, while a number of non-cultural and cultural processes can create vertical or near-vertical orientation of artefacts (e.g. Dibble et al. 1997; Schiffer 1987:270). The stage of an artefact’s uselife is also an indicator of formation processes, for example whether an artefact was whole or fragmented when deposited (Schiffer 1987:271).

A wide range of damage traces provide evidence of a variety of cultural and non-cultural formation processes. Bone can show evidence of fractures, gnawing, cut marks, weathering, and pitting (e.g. Andrews 1995; Auban et al. 2001; Brown 1997:92; Dibble et al. 1997; Schiffer 1987:272-274; Selvaggio 2001). Stone may show evidence of patinas, wind erosion and polish, abrasion through water transport, recycling and secondary use through microflaking and chipping, and damage by ploughing and trampling (e.g. Barton et al. 2002:170; Brown 1997:91; Dibble et al. 1997; McBrearty et al. 1998; Petraglia and Potts 1994; Schiffer 1987:275-276; Shea 1999; Shea and Klenck 1993). Glass and ceramics may show many of the same traces as stone, with the development of patinas, microflaking and abrasion through trampling, abrasion and rounding through water transport, and abrasion through salt erosion and sandblasting (e.g. Blackham 2000; Nielsen 1991; Schiffer 1987:276). Chemical weathering of ceramics has also been determined by assessing its mineralogical composition (Owen and Day 1998). The accumulation of substances on an artefact surface can also provide evidence of formation processes. Accretions may include caliche, desert varnish, lichens, ash, sediments, and mortar (Schiffer 1987:278), or plant and animal tissues such as blood, fats, feathers, and starch grains (e.g. Loy 1993a; Loy 1993b). The dates of artefacts can also be used in identifying formation processes, particularly in assessing the order of deposition (e.g. McCarthy and Ward 2000:123).
More complex properties of artefacts can also be used in identifying formation processes. The quantity of artefacts can be an indicator of cultural deposition as different processes vary in their rates and duration, and will therefore produce different artefact totals (e.g. Barton *et al.* 2002:172; King and Miller 1991; Reitz 1994; Schiffer 1987:279). The comparison of inventories of artefacts among deposits may also be used to identify particular formation processes, for example whether certain materials are absent or not when compared to other deposits (e.g. Schiffer 1987:280; Wilson 1995). The vertical and horizontal distribution of artefacts can be used to indicate a range of formation processes (e.g. Erlandson 1984; Petraglia 1993; Robins 1999; Rowlett and Robbins 1982; Schiffer 1987:280).

In deposits more likely to be sensitive to cultural formation processes, the diversity of artefacts present can be used, including the range of types of artefacts present and the density of the artefacts in the deposit (e.g. McCarthy and Ward 2000:114; Schiffer 1987:281; 1989). Measures of disorganisation can be used to assess artefacts associated in the archaeological deposit that were not necessarily related in the systemic context by looking at levels of completeness and fragmentation, particularly of ceramics and glass (e.g. McCarthy and Ward 2000:114; Schiffer 1987:282; 1989). Reassembly of artefacts, including pottery and lithics, has been used in helping to identify formation processes (e.g. McCarthy and Ward 2000:118; Petraglia 1993; Schiffer 1987:286; Wheeler 2000:8). Rather than reassembly of bone, the assessment of overall representation of specific skeletal elements has been used (Schiffer 1987:287).

The properties of the deposits themselves can provide information about formation processes. Sediments have generally been assessed in terms of non-cultural processes, but cultural deposition or modification of sediment is also prevalent (e.g. Dalan and Bevan 2002; Koppi *et al.* 1985; McCarthy and Ward 2000; Schiffer 1987:288). The colour, patterning, texture and composition of sediments provide insight into the formation processes at work, as do the surface morphology of sediment particles, the resistance of the sediment to applied force, and the degree of compaction of the sediment (e.g. Dalan and Bevan 2002; French and Whitelaw 1999; Grave and Kealhofer 1999; Leigh 1998; Matthews *et al.* 1997:292-293; Schiffer 1987:288-289; Stein 1983). Ecofacts and other intrusive materials in the sediment also provide traces of the environment in which they formed, and include the presence of insects, vertebrate remains, faeces, plant parts and seed, pollen, phytoliths and other plant crystals, land snail shells and nesting material (e.g. Grave and Kealhofer 1999; Lentfer *et al.* 1997; Schiffer 1987:290).
The geochemical properties of the deposit, including pH, moisture content, temperature, and the presence of particular elements and ions can provide indications of both cultural and non-cultural formation processes at work (e.g. Leigh 1998; Loy et al. 2003; Pope and Rubenstein 1999; Schiffer 1987:291). The age of the sediments can also provide an indication of the process of deposition, through the use of techniques such as accelerated mass spectrometry (AMS) radiocarbon dating of charcoal from sediments (Grave and Kealhofer 1999), and optically stimulated luminescence dating of sandy sediments (Frederick et al. 2002). A wide range of traces, under the category of site morphology, can also provide evidence of formation processes, such as furrows, plough scars and potholes (Schiffer 1987:292).

**The Study of Formation Processes in Historical Archaeological Sites**

Although the study of site formation processes is commonly undertaken on prehistoric archaeological sites, it is much less common and less comprehensive in historical archaeological sites. In a review of published historical archaeological literature, only a small number of examples were found to explicitly identify and assess site formation processes, while others gave cursory consideration to the impact of such processes on the site under study. Generally however, the presence of any cultural or non-cultural formation processes and their impact on the archaeological record was either implicit or completely ignored in the interpretations of the evidence.

Many examples of the systematic study of site formation processes in historical archaeological contexts have occurred in North America. Staski (1990) effectively demonstrates the differences in interpretations at a Civil War period fort in New Mexico when taking into consideration the effects of trampling on ceramic artefacts. The processes and associated behaviour of the discard of refuse are particularly well considered in relation to privies and wells by a range of authors including Wheeler (2000) in New Hampshire, McCarthy and Ward (2000) in Minneapolis, LeeDecker (1994) in Delaware, and Reitz (1994) in Florida. The disposal of refuse has also been explicitly considered by King and Miller (1991) in the formation of middens at a late 17th and early 18th century dwelling in Maryland. The processes of the abandonment of sites and the expected reflections of these processes in the archaeological record have been considered at historical mining camps in the southwest Yukon in Canada (Stevenson 1982). The study of formation processes has also been undertaken on ‘modern’ sites. Re-use processes, including recycling and lateral cycling, and their application to historical archaeology, by Wilson (1995), is based on the
study of modern landfills. Early work by Wilk and Schiffer (1979) looks at the processes of discard, trampling and recycling of refuse at a modern vacant lot in Tuscon, Arizona.

In Australia, the most explicit study of site formation processes has been undertaken by Graham Connah, who continues to be a proponent for the importance of the study of site formation in historical archaeological sites (Connah 2003). The processes of abandonment, secondary refuse, scavenging and other disturbance are clearly identified in the excavations at the site of Regentville, near Penrith, a former country mansion from the early 19th century (Connah 1986). An excellent consideration of the archaeological evidence and the impact of site formation processes – including abandonment, discard, salvage and scavenging – are presented by Connah (1994) at the site of Bagot’s Mill, a ruined watermill north of Armidale, New South Wales. Other examples of the study of site formation processes in Australia include Birmingham (1992), who considered, to some extent, the expected discard and maintenance processes when interpreting the patterning of artefacts recovered at the Aboriginal establishment of Wybalenna, on Flinders Island, off Tasmania. The specific assessment of site formation processes in relation to soil disturbance and the planting of vines was undertaken in some detail by Koppi et al. (1985) at an old vineyard at Camden Park Estate, outside Sydney. Lentfer et al. (1997) studied cereal phytoliths in the sediments from the Hope Farm Windmill, outside Sydney in order to identify the activities that formed the archaeological record. More recently, the scavenging, recycling and secondary use of artefacts after site abandonment is clearly identified by Davies (2002) at an early 20th century sawmill in the Otway forests of south-west Victoria.

Another specific area of attention in relation to site formation processes in Australia is that of shipwrecks. Ward et al. (1999) present a new model for wreck site formation based on the non-cultural processes - physical, biological and chemical. Clear identification is made of the cultural formation processes associated with shipwrecks before, during and after the wreck event by Gibbs (2003) in Australasia. The processes of discard, abandonment, scavenging and salvage/reincorporation are all considered by Gibbs (2003), however he uses different terminology for these activities and makes no reference to the processes as identified by Schiffer.
Others have considered site formation processes and their impact to only a very limited extent. Some consideration of the impact of flooding, and mention of discard, recycling and abandonment processes are made by Casella (1997) for the 19th century Ross Female Factory in Tasmania. The processes of discard, sweeping and loss are only referred to in a limited way by Fredericksen (2001) at the military station of Fort Dundas, on Melville Island, off the Northern Territory. Disturbance, recycling, and refuse disposal are also only considered by Higginbothham (1987) in a cursory way in order to explain the range and quantity of artefacts recovered in an excavation of early convict buildings at Parramatta, New South Wales.

**Summary**

The two key models relevant to this thesis are Binford’s application of middle range theory and Schiffer’s behavioural archaeology. There are various types of cultural and non-cultural formation processes, and a number of methods for identifying these processes in the archaeological record. The study of formation processes is undertaken in a limited way in historical archaeological sites both in Australia and overseas. This literature review provides a theoretical and methodological background for this thesis and has identified the importance of explaining and understanding the formation processes at work in an archaeological site before any inferences about behaviour or culture can be made. The next chapter examines the known history of the Commissariat Store site and the evidence of these processes and events expected to be found in the archaeological record.
CHAPTER 3 – HISTORY’S IMPACT ON THE
ARCHAEOLOGICAL RECORD AT THE COMMISSARIAT
STORE

Introduction

From the settlement of early Brisbane in 1824 to the present day, activities and events at the Commissariat Store have formed and shaped the archaeological record (Figure 6). The uses of the building and changes made to it since its construction in 1829 are expected to impact upon the processes of site formation. The expected archaeological implications of these processes are identified and outlined in this chapter.

The Penal System and the Commissariat in Australia

The penal colony at Sydney Cove was established by the British government in 1788 under military structure and rule with Marines used to guard the new settlement (Moore 1987). The official orders of the First Fleet arriving in the new colony were to carry out their duties according to the rules and disciplines of war (Ritchie 1970:4). The Commissariat Department was the military department of procurement, supply and distribution, and was structured by rank, and controlled by the Commissary General in Whitehall (Pearn 1988:57-60). The most senior member of the Commissariat Department in the colony was the Deputy Commissary General based in Sydney, with the Storekeeper being the most senior representative in secondary penal establishments elsewhere in the colony, such as at Moreton Bay (Pearn 1988:63-64). Storekeepers were important men and were second in rank only to the penal establishment’s Commandant (Kennedy 1998:5).

The Establishment and Early Years of Moreton Bay Penal Settlement

The Moreton Bay colony was first established at Redcliffe in 1824 but due to the poor location they moved the settlement the following year to a site on the Brisbane River, 17 miles (27.5 km) from the river mouth (Steele 1975), the location of the present-day Brisbane central business district (Figure 7). The value and importance of the stores and provisions to the settlers is apparent from the beginning of the settlement with Lieutenant Miller receiving his orders from the Governor:
1788  Penal system established in Australia at Botany Bay
1825  Moreton Bay penal settlement established at Brisbane Town site
1829  Commissariat Store building completed
1842  Moreton Bay penal settlement closed
1848  Commissariat Store used as Land Sale Office
1851  Commissariat Store used as office for Inspector of Police
1850s  Commissariat Store used as temporary immigration barracks
1860  Commissariat Store used as police accommodation barracks
c1861  Raised floor installed on ground floor of Commissariat Store
1863  Serious flooding in southeast Queensland
1866  “Bread or blood” riots see workers attempt to storm the Commissariat Store building
1870s-1880s  Commissariat Store used to accommodate overflow of immigrants
1887  New immigration depot "Yungaba" opened at Kangaroo Point
1890  Severe flooding in southeast Queensland
1893  Severe flooding of Brisbane with river rising twice in 22 days. Victoria Bridge and Indooroopilly Rail Bridge destroyed. City inundated
1896  Damage and flooding from Cyclone Sigma from Townsville to Brisbane
1900  Bubonic plague outbreak in Brisbane in April. Authorities respond with fumigation and poisoning of vermin
1912  Third storey added to Commissariat Store. Timber pillars installed on ground floor.
1921  Bubonic plague outbreak in Brisbane in August
1923  State Stores Board created and uses Commissariat Store until 1960
1928  Flooding of Brisbane River in February and April
1931  Cyclonic rain causes flooding and inundation of Brisbane
1954  Flooding in southeast Queensland
1959  Flooding in southeast Queensland
1960  Queensland State Archives occupy ground floor of Commissariat Store
1960  State Irrigation and Water Supply Commission and Department of Justice also occupy Commissariat Store
1968  State Archives move out, and State Library and Law Reform Commission occupy Commissariat Store
1974  One third of Brisbane city inundated by floodwaters
1976  Law Reform Commission abolished and Commissariat Store building left vacant
1977  Royal Historical Society of Queensland granted use of Commissariat Store building for offices, lecture rooms and library
1978  Archaeological investigation of Commissariat Store building prior to restoration
1982  Opening of Royal Historical Society of Queensland headquarters in Commissariat Store
1999-2001  Conservation and interpretation works undertaken. New museum opened

Figure 6: Timeline for changes to the Commissariat Store building and surrounding region.
Figure 7: Moreton Bay region in 1829 showing site of original settlement at “Redcliff Pt” and subsequent settlement at “Brisbane Town” (Steele 1975, redrawn from map by Cunningham, figure 60).
You are particularly enjoined to be as careful as possible of the supplies that accompany you, and to be as sparing as you can in their issue and expenditure. As soon as you land, you are to place a military guard over these stores, which you are to continue at all times; and you are to keep regular accounts of all receipts and disbursements of provisions, slop clothing, tools and implements (Letter from Governor Sir Thomas Brisbane to Lieutenant Henry Miller, 27 August 1824 (Steele 1975:2)).

Once established at the new site, it is likely the first Commissariat Store, a long, low, timber slab building, was constructed near the corner of Elizabeth and Albert Streets (Kennedy 1998:9; Steele 1975:48). The role of the Commissariat in the Moreton Bay settlement was for the provision and issue of goods for the troops and convicts, including tools, building material, ship’s fittings, weapons and troop and convict uniforms not made in the convict workshops (Evans 1982:16). Products and materials not grown in the settlement gardens, or killed and butchered locally were transported by sea from the Sydney warehouses of the Commissariat (Pearn 1988:64). The Commissariat Store also performed as the customs house for the settlement (Evans 1982:16). Between 1824 and 1829, four buildings were associated with the handling of stores for the Moreton Bay settlement – the slab building at Albert and Elizabeth Streets (1825), the stores hut at Amity Point, Stradbroke Island (1825), the magazine at Dunwich, Stradbroke Island (1828) and the stone Commissariat Store building in Brisbane (1829), which still stands today (Kennedy 1998:9).

The New Commissariat Store

The third Commandant of the Moreton Bay settlement, Captain Patrick Logan, commenced duties in March 1826 (Bateson 1966:49). Logan reported in January 1828 that a magazine and granary, 60 feet by 30 feet would be required, as the building currently used for stores was required as a barn (Steele 1975:119). Logan wished to construct buildings in the settlement from stone, rather than the timber construction preferred by the Sydney authorities (Kennedy 1998:11). He argued that stone was less expensive than slab construction, and no more time consuming to construct (Kennedy 1998:11). In July 1828, men in the gaol gang were employed to make the foundations for the new Commissariat Store (Kennedy 1998:12). It took almost four months to dig as they had to be cut into the rock bank of William Street (Kennedy 1998:12).
The new Commissariat Store building was completed on the north bank of the Brisbane River in 1829. The road from Queen Street and the convict barracks ran down the river bank to the Store and the wharf, which provided the only point of entry to the settlement (Kennedy 1998:13) (Figure 8). The building was completed as a two storey utilitarian structure with a shingled hip roof (Figures 9 and 10) and a gable over the central part of the façade facing the river displaying the Royal emblem of King George IV and the date 1829 (Kennedy 1998). The interior contained a 76 foot (23.2 metres) long by 30 foot (9.1 metres) wide open storage space with the first floor partitioned at each end to form storage rooms (Figure 11) (Kennedy 1998:13). There were stairs connecting the two floors, with a ladder from the first floor to the attic space for additional storage (Kennedy 1998:13). The ground floor doors opened towards the river, with the first floor door opening to admit goods using a gantry (Kennedy 1998:13). The windows were small, barred and high up on the walls which were constructed of porphyrity blocks, sourced from the Kangaroo Point cliffs, and dressed and laid with the iron-stained surface exposed (Kennedy 1998:13). Sandstone sourced from the river bank two miles upriver from Oxley Creek, was used for the footings, base course, quoins, sills and lintels (Kennedy 1998:13). Lime mortar was obtained from oyster shells from Amity Point or from the kiln located at Limestone (present-day Ipswich) (Kennedy 1998:13).

The ground floor contained a series of brick-lined drains that drained the floor and possibly the 18 foot (5.5 metres) retaining wall at the rear of the site (Kennedy 1998:14). The drainage system was overlaid with porphyry blocks at the ground level (Kennedy 1998:14) and is likely to have been installed to carry off surface water with the covering stone layer on top to assist in the flow of water into the drain (Wong 1999:59). Water is one of the principal non-cultural agents which deposit sediments in archaeological sites, with rainwater and flooding supplying sediments to sites, and transporting and disturbing them within sites (Schiffer 1987:201). Constructions employed to control the flow of water, such as the drainage system in the Commissariat Store, tend to alter the natural patterns of sediment deposition in archaeological sites (Schiffer 1987:202) and therefore it would be expected that water played an important role in the formation of the archaeological record of the Commissariat Store.
Figure 8: Plan of Moreton Bay settlement in 1829 (Steele 1975, based on survey by Cunningham, figure 59).
Figure 9: Elevation of Commissariat Store from southern, river side of building, 1829 (Steele 1975, figure 61).

Figure 10: Section of Commissariat Store from eastern end of building, 1829 (Steele 1975, figure 62).

Figure 11: Plan of ground floor and yard of Commissariat Store, 1829 (Steele 1975, figure 61).
The Commissariat Store was the site of the distribution of goods and rations to all members of the penal settlement, with no alternative sources for food being available (Pearn 1988:69). The daily rations to government employees, women, children, and convicts included bread, wheat meal, maize, oats, rye, beef or mutton or pork, sugar, salt, soap and vegetables (Pearn 1988:67-68). Additionally, provisions supplied from the Commissariat Store to the settlement’s general hospital included flour, oatmeal, rice, tea, spirits, wine, vinegar, lime juice, scotch barley, sago and arrowroot (QSA PRV5926 1832-1834). The holding and issuing of medical supplies including drugs and surgical instruments was also the responsibility of the Commissariat (Pearn 1988:97). A wide range of medicines, instruments, containers and jars, bandages, syringes, basins and other equipment were supplied to the general hospital (QSA PRV5926 1832-1834). Clothing and other supplies produced by the convicts were also distributed through the Store (Kennedy 1998:15).

Given the sub-tropical climate and occurrence of flooding at the site, it is unlikely that many organic remains of foodstuffs stored in the building at this time would be recovered from the archaeological deposit (e.g. Renfrew and Bahn 1996:55), except perhaps animal bone (e.g. Birmingham 1992; Connah et al. 1978; Williamson 2002). It is expected that remnants from articles of clothing including buttons, buckles and possibly fabric, ceramic or glass containers used to store food, drink and medicinal items, and materials for construction such as nails, may be present. Casella (1997; 2001) found buttons, eyelets, buckles, ceramic, glass, nails, brick, mortar and window glass in her investigation of underfloor deposits at the Ross Female Factory. Bottle glass and nails were the most prevalent item recovered by Fredericksen (2001) in his investigation of the commissariat store building at Fort Dundas, on Melville Island in northern Australia.

The Commissariat Store in the Free Settlement

By the 1830s the British government no longer favoured remote penal settlements as they were deemed to be inefficient, too expensive and failed to reform the convicts (Kennedy 1998:15). The decision was made to close the penal settlement in Moreton Bay and in 1839 it was recommended by a Board of Officers that the British Government should retain the buildings needed for military purposes and transfer the rest to the colonial government free of charge (Johnston 1988:36). The commissariat officer’s quarters, the Commissariat Store, the wharf and boathouse were all retained for existing store purposes and to provide an office and accommodation for the officer and clerk (Johnston 1988:36). On 11 February 1842,
Governor Sir George Gipps proclaimed the opening of free settlement (*New South Wales Government Gazette*, 11 February 1842 (Steele 1975:303)).

### 1840s – 1900

The Commissariat Store remained for the procurement and distribution of supplies for the free settlement (Kennedy 1998:17), even after the disbandment of the Commissariat establishment at Moreton Bay by 1848 (*Sydney Morning Herald* 1848). The wharf alongside the Store continued to be used for government purposes and for a ferry between the town and South Brisbane (Kennedy 1998:17). The building also began to be used for other purposes. In 1848, it was used as a land sale office to accept money from the government auctions of land in the region (Kennedy 1998:17), and in 1851 as the office of the new Inspector of Police for the northern districts (*Sydney Morning Herald* 1851).

In the early 1840s immigrants began arriving to live in the new free settlement and were initially housed in part of the hospital and later in the former military barracks and guard house (Kennedy 1998:17). The gold rushes in New South Wales and Victoria resulted in immigration being suspended in the southern ports with immigrants being diverted to Moreton Bay (Harrison 1990). Immigrants at this time were mainly being recruited from England, Scotland, Ireland and Germany (Harrison 1990; MacGinley 1987; Moses 1987; Woolcock 1986) and in smaller numbers from China, India and North America (Fisher 1987).

This increased demand for accommodation saw the conversion of the Commissariat Store to an immigration barracks during the 1850s (Holthouse 1982:23-24; Kennedy 1998:18). On 29 May 1856 the Clerk of Works, Alexander Beazely, reported to the Colonial Architect in Sydney that “when the depot is overcrowded with immigrants, some of them are lodged in Old Commissariat Store, and remain there frequently for a length of time” (QSA PRV7109 1856:9). He also reported that the facilities at the Commissariat Store were less than adequate:

> The building is situated in a deep excavation on the river bank, and has never been fitted up as a Depot. The windows have neither sashes nor shutters, being merely the usual grated store-windows – there are no conveniences for cooking, eating or washing – the privies, roughly built of slabs and undrained, are not even sufficient for the purposes of decency – and the whole place is totally unfit for human habitation (QSA PRV7109 1856:9).
In April 1857, 143 immigrants arrived from Hamburg, Germany, on the ship *The Helene*, and were quartered in the Commissariat Store before moving on to engaged positions in the Wide Bay and northern districts (*Moreton Bay Courier* 1857). Given the domestic nature of the occupation of the site at this time, it would be expected to find the remains of such items as ceramics, clay smoking pipes, bottle glass, metal utensils, marbles, beads, buttons, coins and animal bone in the archaeological deposit. These types of artefacts have been recovered from a wide range of domestic sites from the 19th century that have been investigated in Australia (e.g. Birmingham 1992; Casella 1997; Connah *et al.* 1978; Williamson 2002). It is likely that items in the archaeological deposit would be of British and German manufacture given the origin of the immigrants at this time.

In 1860, the first floor of the Commissariat Store was converted into quarters for the police constabulary. New windows, internal doors and partitions for single men’s and married men’s quarters were installed (Kennedy 1998:18). A new fireplace, ironbark shingle roof, wall and window were added to the kitchen building which had been constructed in the yard of the Commissariat Store three years previous (Kennedy 1998:18). In addition to domestic items outlined above, items directly related to police activities, such as uniform buttons, and due to the likely presence of weapons in the building, ammunition and related items would be expected to be found in the archaeological deposit. This type of material survives archaeologically as Connah *et al.* (1978) recovered musket balls, gunflints, cartridge cases and projectiles from the house site at Winterbourne, New South Wales, while Williamson (2002) found musket balls, lead shot and gun flints in Tasmania.

In 1861, the conditions of the Commissariat Store were noted by Henry Buckley as being “highly objectionable” with goods being “placed upon empty cases, only a few inches from the damp earth” (QSA SRS5253 1861:66). He stated that goods stored in those conditions were liable to serious deterioration even after a short period (QSA SRS5253 1861:66). He therefore recommended that a raised floor be installed, the walls white washed and the windows enlarged and glazed (QSA SRS5253 1861:66). The exact date of the installation of the raised timber floor is unknown however it was to remain in place on the ground floor until 1978.

The construction of the wooden floor would be expected to change the nature of deposits in the archaeological record. The original stone flagging and underfloor drain would be expected to reveal deposits with the presence of artefacts, as were found in the drainage
system at the Ross Female Factory, Tasmania, (Casella 1997) and in a brick drain at Parramatta (Higginbotham 1983). The covered ‘box-drains’, due to their design, allowed sediments to accumulate (Wong 1999). After the construction of the wooden floor, it is expected that the artefacts would be deposited less frequently and be smaller in size, due to the nature of the wooden floorboards through which only small items could pass, as found by Birmingham (1992:57) in cottage 8 at Wybalenna, Tasmania.

The wooden floor at the Commissariat Store was installed on bearers placed either on the ground, or on random blocks of stone which were possibly from the original floor (Brown 1998:3). The installation of the wooden floor may have caused disturbance to any previous deposits, or accumulation of additional deposits on the stone floor and in the associated drain, particularly as the original stone flooring was removed. Casella (1997) found substantial disturbance to soil deposits and structural foundations likely associated with the construction of wooden floors to replace stone floors at the Ross Female Factory in Tasmania. It is apparent that the wooden floor at the Commissariat Store was repaired many times before it was finally removed in 1978/79 (Brown 1998:4), which may have enabled larger artefacts to become part of the archaeological deposit.

An inspection of goods held at the Store in 1861 itemised candles, candlesticks, cutlery, paper and envelopes, steel pens, wafers (used for sealing letters etc), clothing for foot police, mounted police and native police (including coats, trousers, caps, oilskin capes, wellington boots, shirts, jackets, jumpers and braces), saddles, bridles, pouches, belts, handcuff cases, frays for bayonets, tents, saddle cloths, blankets, brushes, handcuffs, ammunition, and oil for lighthouses (QSA SRS5253 1861). Ammunition and weapons were ordered and received from the Sydney Colonial Stores into the settlement during 1860 and 1861 including ball cartridges, blank cartridges, percussion caps and Calisher and Terry carbines (Robinson 1997:17-23).

On 11 September 1866, the Commissariat Store was the target of the “Bread or Blood” riots in Brisbane town, as it was seen to be a symbol of the establishment and a source of supplies (Kennedy 1998:17). A local financial crisis, and foreseeable unemployment and hardship saw railway workers and unemployed persons march on Town Hall, attempt to storm the Store and stone police (Gaylard and Hart 1992:39; Kennedy 1998:17). They attempted to force entry into the building and the door was partly damaged by stones, however entry was not gained (Brisbane Courier 1866:2).
At some stage after 1861 the Store was used as police accommodation, and it was again used to accommodate the overflow of immigrants in the 1870s and 1880s when Queensland received more immigrants than anywhere else in Australia (Harrison 1990:186; Kennedy 1998:18). Again the immigrants were most commonly arriving from England, Ireland, Scotland and Germany during this period (Corkhill 1992; MacGinley 1987; Moses 1987). In 1887, a new immigration depot, “Yungaba”, was opened at Kangaroo Point, and it is unlikely that the Store was used for immigrants after this time (Kennedy 1998:18). Again, from this period of occupation of the Commissariat Store by immigrants, it could be expected to see the occurrence of domestic items such as ceramics, glass, buttons and coins in the archaeological record, as outlined above.

Throughout this entire time, the building continued being used as a store. In 1867 a large consignment of weapons and ammunition was received to be issued to police and gaols (Robinson 1997:35-36). Westley Richards and Co pin fire carbines with Le Faucheux action were ordered from Birmingham, along with associated ball cartridge, cartridge cases, felt wads, cloth wads and caps (Robinson 1997:35-36). These weapons proved to be of unsatisfactory design and were completely disposed of by 1870 and replaced by Snider carbines and Webley Royal Irish Constabulary revolvers and ammunition (Robinson 1997:38, 44-45), followed by Martini-Henry rifles and carbines from 1877 through the 1890s (Robinson 1997:53, 59).

In 1873, the building was painted and part of the front wall was underpinned (Kennedy 1998:19). Damage to the stone along the bottom of the building caused by exposure and rising damp was repaired with cement (Kennedy 1998:19). In 1886, the Colonial Storekeeper’s report of inadequate room for increasing storage and work demands, saw the construction of a single storey brick wing at right angles to the original building (Kennedy 1998:20). The kitchen was moved to adjacent land, and stables were housed in the western corner of the yard (Kennedy 1998:20). The stables were destroyed by fire in 1888, and although there was no damage to the main building, a fireproof strong room, for the storage of records and books, was constructed on the ground floor in 1889 (Brown 1998:8; Kennedy 1998:20). After the immigrants vacated, the building was still not completely occupied by stores, so it was also used as office accommodation for visiting Justices at St Helena Island prison and the Dunwich Benevolent Asylum for a period up until 1891 (Kennedy 1998:19).
During the 1890s the Commissariat Store provided a wide range of goods for order at contracted prices, with a sample of most items kept at the Store (Department of Colonial Stores 1892; 1898; 1900). The types of samples stored included all forms of stationery, ink, surveyors’ materials, drapery (including prisoner, warder and police clothing, badges and buttons), hats and caps, blankets and rugs, bedding, crockery, earthenware, glassware, brushware, ironmongery, leather, saddlery, shoemaking equipment, and ship chandlery (Department of Colonial Stores 1892; 1898; 1900). Some items were kept in stock at the Store, including clothing items and ammunition for Martini-Henri and Snider carbines and rifles, and Webley revolvers (Department of Colonial Stores 1898; 1900).

Flooding of the region occurred in 1863 and 1890, and the months of January and February 1893 saw three cyclones in southeast Queensland, with the Brisbane River rising to over 9 metres (Bureau of Meteorology 1974) twice in 22 days (Gaylard and Hart 1992). The city was inundated, the Victoria Bridge and the Indooroopilly Rail Bridge were destroyed, and three ships were washed into the Botanic Gardens (Gaylard and Hart 1992:78).

Measurements of the Commissariat Store site undertaken in 1999 indicate that the 1893 flood level of 9.62 metres above the official datum, would have seen the floodwater enter the Commissariat Store and cover the timber floor to a depth of 3.3 metres (Alan H Spry and Associates 1999:15). The flooding of the site could be expected to be evident in the sedimentary deposits, particularly in relation to their depth and type (e.g. Casella 1997:83). Presuming the floodwaters inside the building would have been moving at a slow rate, as compared to the external flow of the floodwaters, small and lightweight particles, such as silt, would be expected to have been transported into the site (Schiffer 1987:233; Turnbaugh 1978:598).

**1900s – 2001**

Rats were a problem throughout the history of the Store with repeated repairs being made to the ground floor walls to prevent rats entering the building through holes, and the construction of a grocery room in 1951 to protect stores from rats (Brown 1998:4, 8). Rodent behaviour in an archaeological deposit can be expected to be revealed in concentrations of non-cultural rodent bone, intrusive cultural material in lower levels of the site, distinct distribution of small and large materials in the site, vertical movement of sediment material, and traces of burrows (Bocek 1986; Schiffer 1987).
The Commissariat Store building continued its use as a store into the 1900s despite a request in 1907 to move the stores to a more convenient location closer to the steamer wharf and Roma Street Railway Station, which was then a focus for the transport of goods (Kennedy 1998:20). Further complaints about the inconvenience of the location of the Store building led to the addition of a third storey enabling access to the building from William Street for the first time (Kennedy 1998:21). The addition, completed in 1912, was constructed of cement-faced brick and not only provided improved access but also increased space for the accommodation of stores (Kennedy 1998:21). The additional storey required minor changes to the existing floors with new timber pillars on the ground and first floors to support the additional weight of the new storey (Kennedy 1998:21). In 1914, an electric lift, which ran between all three floors of the building was installed (Kennedy 1998:22).

In 1923, a change in the way stores were handled by the government administration saw the creation of the State Stores Board. At the end of the 19th century, each government department operated their own independent stores and obtained quotations and made purchases separately (Kennedy 1998:22-23). With the creation of the State Stores Board, any goods required by government departments were purchased and distributed centrally (Kennedy 1998:23). Throughout the 1920s, the State Stores Board invited tenders, processed orders and distributed the purchased goods to government departments (Kennedy 1998:24). The ground floor was used as a store room with goods being brought along Queen’s Wharf Road and loaded into the building via the loading ramp connected to the double doors (Kennedy 1998). Packing and dispatch was located on the first floor, and the accounts room on the second floor of the Commissariat Store building (Kennedy 1998:24). Items supplied through the State Stores Board in 1923 included tea, a range of fabric including wool flannel, calico, ticking, canvas, tweed and hessian; paper and cardboard, tar oil disinfectant, wire netting, oils, paints, iron, steel and ship chandlery (QSA PRV11508 1923). The artefacts expected to be found in the archaeological deposit from this time would likely differ from an earlier time when domestic activities were also taking place in the building. It is expected that a relative increase in non-domestic artefacts would be apparent, including items ordered for State government departments, along with items used by the staff working within the Store.

The Commissariat Store building changed little from this time until the 1970s, with internal temporary partitioning changed to meet various staff needs, and no substantial external changes (Kennedy 1998:24). A new lift was added in 1965 to provide access to the attic.
space which was used for storing records (Kennedy 1998:25). The existing penthouse with the old lift machinery was demolished, and the fleche on the roof was probably removed at this time (Kennedy 1998:25).

Regular flooding occurred in the region throughout this time with flooding of the Brisbane River in 1928, major inundation and a storm surge in Moreton Bay in 1931, and flooding of the southeast region in 1947, 1954 and 1959 (Gaylard and Hart 1992). In January 1974, a major flood of the Brisbane River saw a third of the city inundated, 7000 homes flooded and 12 people drowned (Gaylard and Hart 1992:315). The flood in 1974 saw the river rise to a height of 6.37 metres above the official datum (Alan H Spry and Associates 1999:15). With the southern doorstep of the Commissariat Store at a height of 6.47 metres the floodwater would have reached the front wall of the building but not entered (Alan H Spry and Associates 1999:15). If the underfloor drainage system was not blocked at this time, it would have been filled with floodwater, with the surrounding bedrock and fill being saturated, and the drain possibly filled with sediment (Alan H Spry and Associates 1999:15).

Not only was the Commissariat Store building being used for stores, but also for office accommodation for other overcrowded government departments (Kennedy 1998:25). The State Irrigation and Water Supply Commission occupied the building from 1960 to 1962, and later in the 1960s the Department of Justice were occupants (Kennedy 1998:25). From 1960 to 1968, the large space on the ground floor was made available to the Queensland State Archives for storage (Kennedy 1998:25). When the State Archives vacated the premises in 1968 the State Library and the Law Reform Commission moved into the space temporarily (Kennedy 1998:25). In 1976 the Commissariat Store building was vacated completely and the adjoining brick annexe was demolished (Kennedy 1998:25).

During the 1970s, stonemasons were employed to repair government buildings including the Commissariat Store (Kennedy 1998:25). At the Store, stone was replaced and cleaned to remove the lime wash, and the walls were strengthened by removing and replacing the original lime mortar with harder cement rich mortar (Kennedy 1998:25).

In 1977, the Royal Historical Society of Queensland was granted occupation of the building for use as offices, lecture room and library (Kennedy 1998:26). The Senior Architect at the Department of Public Works, Frank Hall, made a number of recommendations for the renovation of the building for the new tenants, including changes to the ground floor in
particular. These included the removal of the timber flooring on the ground floor to be replaced with reinforced concrete (Kennedy 1998:26). The timber beams supporting the floor above were considered inadequate and needed to be replaced with reinforced concrete columns (Kennedy 1998:26). In addition, it was recommended that the lift well, strong room, internal stairs, sheeting on the walls and the pressed metal ceiling should all be removed (Kennedy 1998:26). The report from Hall formed the basis for the major restoration of the Commissariat Store undertaken in 1978 and 1979 (Kennedy 1998:27).

In conjunction with the restoration of the Commissariat Store building, an archaeological investigation of the western end of the ground floor was undertaken by Queensland Museum staff and volunteers (Kennedy 1998:27). This will be discussed in detail in the following chapter. Subsequent to the archaeological investigation, the major refurbishment work of the Commissariat Store building was undertaken. On the ground floor in particular, the 1889 strong room and lift, and the 1951 grocery room was demolished, and the c.1861 timber floor was removed, exposing the remains of the original porphyry flagging (Brown 1998:8; Kennedy 1998:28). To illustrate the brick-lined drain that was revealed during the archaeological excavation a trap door was installed in the ground floor, and the original flagging was reinstalled using sandstone instead of porphyry (Kennedy 1998:28). A major project to conserve and interpret the building was undertaken for the Royal Historical Society of Queensland from 1999 to 2001 with the development of a museum exhibition and associated interpretive materials (Cleary 2001:viii). Today, the Commissariat Store is headquarters to the Royal Historical Society of Queensland and contains its offices, library and museum (Royal Historical Society of Queensland n.d.).

**Summary of Archaeological Implications**

From the Store’s construction in 1829, during the days of the penal settlement at Moreton Bay, until the 1970s, it was used for the storage and distribution of goods to the residents of the area. The building has also been used for domestic accommodation for housing immigrants and the police, and for offices for various government departments. These various uses will have had an influence on the artefacts to be found in the archaeological deposit at the site (Table 3). Other effects and disturbances on the site over its history are likely to include water movement due to the underfloor drain, the activity of rats in the building and the flooding of the Brisbane River. The archaeology of the Commissariat Store site and the cultural and non-cultural formation processes will be discussed in the following chapters.
Table 3: Historical events in relation to the Commissariat Store and their expected implications for the archaeological record.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Expected implications for the archaeological record</th>
</tr>
</thead>
<tbody>
<tr>
<td>1829</td>
<td>Construction of Commissariat Store including brick-lined drains and overlaid porphyry blocks on the ground floor.</td>
<td>Control of flow of water in the site altered natural patterns of sediment deposition in the site.</td>
</tr>
<tr>
<td>1829 - 1842</td>
<td>Storage and distribution of food, clothing and equipment to all members of the penal settlement.</td>
<td>Remains of animal bone, clothing remnants such as buttons, buckles and fabric, ceramic or glass containers used to store food, drink and medicines, construction materials such as nails present.</td>
</tr>
<tr>
<td>1829 - 1978</td>
<td>Repeated repairs to ground floor walls to prevent rats entering the building through holes. Construction of grocery room because of rat problem in 1951.</td>
<td>Rodent behaviour including concentrations of non-cultural rodent bone, intrusive cultural material in lower levels of the site, distinct distribution of small and large materials in the site, vertical movement of sediment material, or traces of burrows in the site.</td>
</tr>
<tr>
<td>1842 - 1976</td>
<td>Storage and distribution of supplies to the colony and State.</td>
<td>Remains of clothing such as buttons, buckles and fabric, remains of paper/stationery, ammunition and other equipment stored.</td>
</tr>
<tr>
<td>1850s</td>
<td>Immigration barracks for influx of immigrants from England, Ireland, Scotland, Germany and China.</td>
<td>Domestic items such as ceramics, clay smoking pipes, bottle glass, metal utensils, marbles, beads, buttons, coins and animal bone present. Items of British, German or Chinese manufacture present.</td>
</tr>
<tr>
<td>1860</td>
<td>Quarters for police constabulary.</td>
<td>Domestic items, and police related items such as uniform buttons, ammunition and weapon-related items present.</td>
</tr>
<tr>
<td>1861 - 1978</td>
<td>Raised timber floor constructed on the ground floor over the underfloor drain, including removal of original stone flagging.</td>
<td>Less frequent deposition of items, smaller deposition of items due to the nature of the wooden floorboards through which only small items could pass. Disturbance of previous deposits during construction. Accumulation of additional deposits during removal of stone floor.</td>
</tr>
<tr>
<td>1861 - 1978</td>
<td>Repeated repair of timber floor until removal in 1978.</td>
<td>Larger items able to be deposited during repairs.</td>
</tr>
<tr>
<td>1870s - 1880s</td>
<td>Immigration barracks for influx of immigrants from England, Ireland, Scotland and Germany.</td>
<td>Domestic items such as ceramics, clay smoking pipes, bottle glass, metal utensils, marbles, beads, buttons, coins and animal bone present. Items of British or German manufacture present.</td>
</tr>
<tr>
<td>1893</td>
<td>Major flooding of the Brisbane River.</td>
<td>Small, lightweight particles, such as silt, transported into the site by floodwaters.</td>
</tr>
<tr>
<td>1923</td>
<td>Formation of State Stores Board for purchasing, storage and distribution of goods for all government departments from the Commissariat Store.</td>
<td>Relative increase in stationery and equipment for government departments including paper, pins, paperclips, nails, screws, and items used by staff.</td>
</tr>
<tr>
<td>1928 - 1974</td>
<td>Regular flooding of the Brisbane River and surrounding region.</td>
<td>Small, lightweight particles, such as silt, transported into the site by floodwaters. Movement of sediments and artefacts in the drain.</td>
</tr>
<tr>
<td>1960 - 1976</td>
<td>Office accommodation for government departments.</td>
<td>Office related items such as stationery present.</td>
</tr>
</tbody>
</table>
CHAPTER 4 – ARCHAEOLOGICAL EXCAVATION

AND DATA

Introduction

The Commissariat Store site was excavated in 1978/79. There are a number of problems with the archaeological data yet most of the stratigraphy and artefact provenances have been able to be reproduced. The presentation of the archaeological data enables the analysis of such data in conjunction with the history of the site. The analysis, discussed in the next chapter, allows for the identification of site formation processes at the Commissariat Store site.

Data Issues

In analysing the data recorded during the archaeological excavation of the Commissariat Store, a number of issues and limitations were identified. The activities undertaken in the excavation were recorded on site in field notebooks (QM S857/12684 1978; QM S857/12685 1978), an artefact and feature register (QM S857/12687 1978; QM S857/12688 1978; QM S857/12689 1978) and a photographic collection (QM S857/12690 1978). An interim report (Sanker 1979) and a final report (Sanker n.d.) were written after the excavation was completed. The problems with these recordings are:

- The field notes were limited in detail with no clear sediment descriptions;
- Some excavation units (XUs) were excavated without any notes being kept although evidence for their excavation exists in the physical artefacts, the recorded excavation of lower XUs and from photographs;
- The excavation methods and rationale were not clearly described in any of the documentation probably due to the salvage nature of the investigation;
- It is unclear from the documentation whether the XUs were excavated within the natural stratigraphic units (SUs) of the site or not; and
- Only limited descriptions were recorded for the features identified in the site.

Measurements of the floor bearers, and the supporting pillars were captured in the site plan of the ground floor (QM S857/12681 1978). Limited description in the field notebooks was provided for a “mortar structure”, and “old concrete floor” (QM S857/12684 1978; QM S857/12685 1978). Some notes were made on the impressions of flagstones and the flagstone flooring in the field notebooks (QM S857/12684 1978; QM S857/12685 1978) and they appear in some section drawings (QM S857/12669 1978; QM S857/12674 1978).
The data from the artefact registers were entered into a Microsoft Access database from 1997 to 2001 by 18 different operators. The exact provenance of each artefact was not always clearly entered into the database, and a range of different text formats have been used for recording the location (eg: G15/1 or Square G15 Unit 1 etc) making it difficult to accurately extract these details. The database does not provide for classification of artefacts by materials or by functional object types and the artefact data had not been classified in this way.

In summary, the data I worked with was variable in its quality and comprehensiveness and required considerable time to collate and organise into a format which could be effectively summarised and analysed. These limitations have impacted on the level of detail able to be provided in interpretations of the data.

Archaeological Investigation of the Commissariat Store

In conjunction with the 1978/79 restoration work proposed for the Commissariat Store building by the Queensland Department of Works and Housing, the Queensland Museum was invited to undertake an archaeological investigation of the site (Sanker 1979). The project was undertaken by staff of the Anthropology and Archaeology section, and Industrial Technology section of the Queensland Museum and was directed by Michael Quinnell, Curator of Anthropology and Archaeology (Sanker 1979). The excavation was undertaken from 3 November 1978 to 12 January 1979 by staff of the Queensland Museum, non-museum volunteers, and other specialists (Sanker 1979). The investigation was a salvage excavation with no set timeframe or funding provided by the Department of Works and Housing (Robins 2003: pers. comm.). As the work was required to start rapidly a detailed history was not established prior to commencing the fieldwork (Sanker n.d.). Some documentary sources, including the 1838 and 1840 building survey plans and other papers, were checked to establish the known history and layout of the site (Sanker 1979).

The archaeological investigation began with a building survey, and datum points were established by the Department of Surveying, Queensland Institute of Technology, to allow for full control of measurement at the site (Sanker 1979). The ceiling of the ground floor was removed by staff from the Department of Works and Housing with considerable debris recovered from the ceiling bays (Sanker 1979). The wooden floor on the ground floor was progressively removed with the northwest half of the floor being removed on 6 November 1978 (QM S857/12684 1978). A 1m by 1m grid was laid out over the floor area using string
lines (Sanker 1979). Figure 12 provides a detailed site plan of the ground floor interior of the building with the underfloor bearers, stone block supports and ceiling-supporting pillars and other features. The site was divided into 280 grid units (GU) using an alphanumeric grid (Figure 12). William Street runs in an approximately east-west direction and an arbitrary Grid North (GN) was set by taking the wall nearest William Street as the north wall. The site datum was situated at the co-ordinates 1.000E and 5.000N which placed it outside the eastern door of the building. The vertical position of the datum is unclear from the field notes. Additional temporary datums were later set up inside the building.

Grid units (GU) inside the building were excavated individually with the excavation units (XUs) appearing to generally follow the natural units of the deposit within each GU, although this is not completely clear from the field notes (QM S857/12684 1978; QM S857/12685 1978). Excavation focused on the grid units in the western two-thirds of the building with 155 grid units having XU1 excavated, 120 grid units having XU2, 42 grid units XU3 and 19 grid units XU4 and drain deposits excavated. A brick-lined drain, covered with sandstone blocks was revealed during excavation of XU3 and XU4. The excavation of the sediments from inside the drain were undertaken in various XUs ranging from five to ten centimetres each, or as a complete XU in different grid units. The methods used in each grid unit for the excavation of the drain are not clearly recorded.

The recovered material was dry sieved, sorted, identified and registered at the site with a grid unit number and excavation unit number (e.g. F16/2) and an artefact find number (e.g. HS1343) (Cleary 2001:40; QM S857/12688 1978; QM S857/12689 1978). Features identified during the archaeological excavation were registered at the site with a feature number (eg: F109) (QM S857/12687 1978). The artefact collection was placed in off-site Queensland Museum storage until 1994 when the collection was re-catalogued and incorporated into the collections of the Queensland Museum Archaeology Section (Robins 2003: pers. comm.).
Figure 12: Site plan of the ground floor of the Commissariat Store after removal of the floorboards (Adapted from QM S857/12681 1978).
(Note: drain outline depicts grid units containing evidence of the drain).
Stratigraphy

The following descriptions of the stratigraphic units (SUs) at the site are based on the field notes (QM S857/12684 1978; QM S857/12685 1978), section drawings (QM S857/12666 1978; QM S857/12675 1978), reports (Brown 1998; Sanker 1979) and information from Richard Robins who was involved in the excavation (Robins 2003: pers. comm.). Figures 13 and 14 show the stratigraphy in the area of the site near the drain feature, while figures 15 and 16 display the typical stratigraphy of the rest of the site.

Figure 13: Stratigraphic profile of GU DEF18 facing west (Adapted from QM S857/12675 1978).

Figure 14: Stratigraphic profile of GU JKL18 facing west (Adapted from QM S857/12669 1978).
Figure 15: Stratigraphic profile of GU IJ13 facing west (Adapted from QM S857/12672 1978).

Figure 16: Stratigraphic profile of GU KL13 facing west (Adapted from QM S857/12674 1978).

**SUI**

SUI is a greyish brown, loose and friable soil mixed with straw, mortar, and nails, ranging in depth from 2 to 12 cm. It occurs on the surface over most of the excavated area from the centre of the building towards the west end of building. Figure 17 displays the distribution of SUI across the site. In some instances SUI appears as only a thin mix of inclusions such as straw, mortar and nails on the surface of other sediments. It is unclear whether SUI extends into the eastern half of the building due to the insufficient documentation, and less excavation carried out there. Localised disturbance of SUI occurs with two rats’ nests located in GU K11 (Figure 18), and fig tree roots appearing near the western wall of the building in GU K6.
Figure 17: Distribution of SUI across the site.

Figure 18: Distribution of rats’ nests across the entire site in all SUs.
SUII

SUII consists of fine, brown silt ranging from light to dark brown between a depth of 1 and 22 cm. SUII appears across most of the excavated grid units, appearing on the surface in the southwest corner and along the western wall of the building. SUII underlies SUI across most of the site (Figure 19) except in:

- GU D6 and D7 where SUII overlies a sediment of similar description to SUI;
- GU I13 and E16 where SUI directly overlies SU III and an undescribed bituminous substance; and
- GU H14 where only SUI is noted.

The presence of the atypical profile in GU D6 and D7 has not previously been identified in the excavation notes and literature. While manually mapping the sediment descriptions from the excavation notes, it became apparent that SUII overlies SUI in this area. This is important in identifying the site formation processes at work, particularly in the formation of SUII.

It is unclear whether SUII extends into the eastern half of the building due to the insufficient documentation, and limited excavation. Disturbances occur in SUII with a rats’ nest appearing in GU E17, two rats’ nests in GU F10, and one in GU F14. A fourth rats’ nest also occurs in the southwest corner of GU J14 at the junction of SUII and SU III (Figure 18).
SUIII

SUIII consists of hard mortar with some softer decomposed mortar (Figure 20). The mortar layer displays impressions of flagstones in some areas, while the porphyry flagstones are still in place over the mortar in GU E15 and along the northern (GU L13 and L14) and western walls (GU E6). SUIII generally ranges in depth from 1 to 11cm, and up to 20cm where the mortar surrounds the porphyry blocks. The mortar layer appears patchily across the site but underlies SUII in most instances, except for GU I13, E16, D6 and D7 as described above in SUII.

A rats’ nest occurs in GU E6 along with SUIII and flagstones along the western wall of the building (Figure 18). Another nest, disturbing both SUIII and SUV, is situated in GU E13 near the edge of the drain feature. A rats’ nest is also adjacent to SUIII in the corner of GU J14.

![Figure 20: Distribution of SUIII across the site.](image)

SUIV

SUIV is a sandy loam, dark brown in colour with darker and lighter lenses throughout ranging in depth from 2 to 8cm. SUIV appears only adjacent to or above the drain feature in GU E14, D16, E16 and D18, E18 and F18.
SUV

SUV consists of fragments of phyllite bedrock. SUV occurs in most instances underneath SUIV adjacent to the brick-lined drain feature (described below) in the central area of the building (Figure 21). The only instances where SUV does not occur adjacent to the drain feature are:

- GU H11 which contains a supporting post;
- GU H21, adjacent to a supporting post; and
- GU D6 and D7 which contain a matrix described as rubble and fill which may or may not be SUV.

A rats’ nest is situated in GU E14 with both SUIII and SUV at the corner of the drain feature (Figure 18). A second rats’ nest is situated in the southern edge of GU J14 overlying a stone block covering the drain feature. This nest may be a continuation of the rats’ nest situated in the overlying layer in the southwest corner of J14 in close proximity to both SUII and SUIII. Another occurs in the southwest corner of GU E14 on the inside corner edge of the drain feature and adjacent to the stone block covering the drain. This nest may be a continuation of the nest located in the adjacent grid unit (E13) between SUIII and SUV.

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Figure 21: Distribution of SUV across the site.
**SUVI**

SUVI is the sediment located within, and confined to the brick-lined drain feature. There are two distinct stratigraphic units within the drain – SUVIa and SUVIb. SUVIa is a dark soil with grey clay and silt inclusions that overlies SUVIb, a red coloured oxide layer. The oxide layer consists of an enormous number of rusted nails. SUVIb occurs in the bottom 5cm of the drain in GU I16 and 17. The depth of SUVIa and SUVIb in other areas of the drain, however is unclear. SUVIa and SUVIb both occur in GU I16, I17, E18, E19, while SUVIb is noted as occurring in the “southern drain complex” and is specifically noted in GU E16, E17 and J18.

**SUVID**

SUVID consists of phyllite bedrock and underlies the site. The drain feature has been excavated into the bedrock. SUVID was found in the following excavated grid units, but is assumed to underlie the entire site:

- C13 adjacent to a sandstone block;
- D14 underlying silt and phyllite fill;
- K18 in the southeast corner adjacent to the drain;
- L11 underlying silt and stone rubble; and
- L12 underlying SUI.

**Archaeological Features**

A number of features were revealed during the excavation undertaken at the Commissariat Store site. The following descriptions have been distilled from the reports (Brown 1998; Sanker 1979; n.d.), field notes (QM S857/12684 1978; QM S857/12685 1978), section drawings (QM S857/12669 1978; QM S857/12674 1978), site plan (QM S857/12681 1978) and photographs (QM S857/12690 1978).

**Bearers and Supporting Pillars**

The wooden floor of the ground floor of the Commissariat Store was laid on wooden bearers which were placed either on the ground surface or on blocks of stone. The site plan (Figure 12 above) displays the bearers and stone blocks for the entire ground floor. The bearers running north-south were 150mm deep and between 60 and 85mm wide. Some bearers were damaged by white ants, particularly in the north west corner of the building (GU I-K6 and J-K7 – Figure 12 above) and in GUs H12 and K9. The floorboards were 152mm wide and 25mm thick shot-edged hardwood boards with an estimated gap of approximately 3mm
between each board. Seven timber pillars supported the first floor above, with two additional pillars on the corners of the lift shaft at the eastern end of the building (Figure 12 above).

**Mortar Structure**

A “mortar structure” was identified as a Feature (F23) in GU G6 and G7. There is no additional description in any of the site records of the feature, and it may actually be associated with SUIII (the mortar layer).

**Old Concrete Floor**

The remains of concrete flooring were revealed in GU J6, J7 and I7 during excavation. The presence of concrete over flagstones was also noted on the site plan in GU L8, L9 and L10. The concrete exists in the location of the grocery room constructed in 1951.

**Flagstones**

Porphyry flagstones were identified in a number of locations at the site. The stones overlay SUIII, with impressions of flagstones within the mortar. Flagstones were located along the northern wall of the building in GU L11 to L16, and along the western wall in GU C6, D7, E5, E6, F6 and J6. Flagstones were also located in GU E14, E15, F15 and I14. Clear impressions in the mortar layer enabled the identification of the previous presence of 23 flagstones in GU D15, 21 in GU E6, 24 in GU E7, 22 in GU E10 and 21 in GU E11.

**Drain**

A u-shaped drainage system was found cut into the bedrock of the site. The main drain ran in the central area of the building from north to south towards the river with the exit blocked by two wrought iron bars (Figure 12 above). Two transverse drains crossed the main drain close to the northern and southern walls. The drain was lined with a course of nine bricks across its width, with a block of tuff on each side (Figure 22). The bore of the drain was covered with large sandstone blocks (Figure 23). Each of the transverse drains ended in brick-lined sumps near the surface of the flagstone floor, with the floor sloping from north to south. The flagstones and mortar flagstone-impressions in line with the four drainage holes at the ends of the transverse drains indicate a different direction of setting to the other flagstones. These different alignments extend to the eastern and western walls.
Figure 22: Section profile of the southern transverse drain facing west (Adapted from QM S857/12675 1978).

Figure 23: Plan view of the sandstone blocks overlying the brick-lined drain (Adapted from QM S857/12678 1978).
Artefacts

All artefacts recovered from the Commissariat Store site were recorded on site and the data later entered into a Microsoft Access database. To enable an effective analysis of the data, I needed to classify the artefacts by material type and by object type, which had not occurred previously. The material type categories were established to ensure the majority of artefacts would be classified and were based on similar classificatory systems applied to other historical archaeological sites in Australia (Table 4). The object type categories were based on functional attributes also commonly used with other historical archaeological collections (Table 5). The classification of the artefacts was undertaken using an automated method by running database queries to search for keywords in the artefact description and populating the material type or object type field. For example, searching on the words “ceramic”, “stoneware”, “china”, “clay”, “earthenware”, and “porcelain” in the description field, and populating the material type field with the category “ceramic”.

All artefacts were originally entered in the database according to the XU in which they were recovered. In order to effectively analyse the data in relation to site formation processes I converted the XU locations of artefacts to their SU locations. I undertook this conversion grid unit by grid unit by consulting the original field notes and the description of the sediment for each XU. In some cases the description of the sediment for a single XU indicated more than one SU. In these cases the SU is indicated as a combination, eg: SUI/II, SUIII/V. Due to the incomplete nature of the field notes, 22% (8038) of the artefacts recovered were unable to be assigned an SU location. These artefacts are designated with the location “SU nd” (not described). The artefacts where the SU is not described are included in the data presented below when discussing numbers of artefact types recovered. They are excluded however in the presentation of data on the horizontal and vertical distribution of artefact types in the site.

The following data focus only on those artefacts from the excavation of the ground floor, and not those recovered from the ceiling bays, first floor rooms or areas external to the building. This is because this research focuses on the formation of the archaeological record on the ground, under the floorboards of the Commissariat Store building. The data for the ground floor overall is presented first. The artefacts recovered in each SU are then presented.
Table 4: Material type categories and definitions and inclusions used to classify artefacts.

<table>
<thead>
<tr>
<th>Material Types</th>
<th>Definition, inclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone</td>
<td>Animal bone, crab and sea urchin spines</td>
</tr>
<tr>
<td>Brick, mortar</td>
<td>Brick, mortar, plaster, stone, cement</td>
</tr>
<tr>
<td>Ceramic</td>
<td>Earthenware, stoneware, china, clay, porcelain</td>
</tr>
<tr>
<td>Chalk</td>
<td>Blackboard chalk</td>
</tr>
<tr>
<td>Charcoal etc</td>
<td>Charcoal, coke, cinder, coal</td>
</tr>
<tr>
<td>Chemical</td>
<td>Rat poison, paint</td>
</tr>
<tr>
<td>Cork</td>
<td>Cork</td>
</tr>
<tr>
<td>Fibres</td>
<td>Rope, string, fabric, fibres, cloth, twine, cord</td>
</tr>
<tr>
<td>Glass</td>
<td>Glass</td>
</tr>
<tr>
<td>Leather</td>
<td>Leather</td>
</tr>
<tr>
<td>Metal</td>
<td>Metal, lead, copper, iron, tin</td>
</tr>
<tr>
<td>Paper</td>
<td>Paper, cardboard, cigarettes</td>
</tr>
<tr>
<td>Plastic</td>
<td>Plastic, bakelite, polystyrene</td>
</tr>
<tr>
<td>Rubber</td>
<td>Rubber</td>
</tr>
<tr>
<td>Seeds</td>
<td>Seeds, pits, grain</td>
</tr>
<tr>
<td>Shell, coral</td>
<td>Shells, coral pieces</td>
</tr>
<tr>
<td>Soil</td>
<td>Soil samples, silts samples, mud nests</td>
</tr>
<tr>
<td>Straw</td>
<td>Straw, grass</td>
</tr>
<tr>
<td>Sulphur</td>
<td>Sulphur</td>
</tr>
<tr>
<td>Wood</td>
<td>Wood, timber, cane</td>
</tr>
<tr>
<td>Other</td>
<td>All other material types not elsewhere classified</td>
</tr>
</tbody>
</table>

Table 5: Object type categories and definitions and inclusions used to classify artefacts.

<table>
<thead>
<tr>
<th>Object Type</th>
<th>Definitions, inclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beads</td>
<td>Glass and ceramic bottles</td>
</tr>
<tr>
<td>Bottle</td>
<td>Buttons, clasps, cuff links</td>
</tr>
<tr>
<td>Button</td>
<td></td>
</tr>
<tr>
<td>Clay Pipe</td>
<td></td>
</tr>
<tr>
<td>Cigarettes</td>
<td></td>
</tr>
<tr>
<td>Coins</td>
<td></td>
</tr>
<tr>
<td>Fabric/Cloth</td>
<td></td>
</tr>
<tr>
<td>Field Documents</td>
<td>All documentation including notebooks, registers, section drawings, plans etc</td>
</tr>
<tr>
<td>Nails</td>
<td>Pens, nibs, paper clips, etc (not fully classified to date)</td>
</tr>
<tr>
<td>Office Equipment</td>
<td></td>
</tr>
<tr>
<td>Rat Poison</td>
<td></td>
</tr>
<tr>
<td>Screws</td>
<td></td>
</tr>
<tr>
<td>String/Rope</td>
<td></td>
</tr>
<tr>
<td>Weaponry</td>
<td>Ammunition, cartridges, wads, shot, bullets</td>
</tr>
<tr>
<td>Window</td>
<td>Window glass</td>
</tr>
<tr>
<td>Wire</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>
I then focus on a selected number of artefact types recovered from the site. These artefact

types were selected in order to identify the site formation processes, and were based on one

or more of the following criteria:

- The known presence in the Store of various items at various times, e.g.: the storage of
ceramics, glass, buttons etc for distribution to the public service;
- Ability to date the artefact, based on the various uses of the Store throughout its
history, e.g.: residence of police constabulary, residence of immigrants;
- Ability to date the artefact, based on manufacture of material type and object style;
- Distribution of the artefact type both horizontally and vertically through the site;
- Likely change in use of the artefact through time; and
- Inclusion of both organic and non-organic materials in order to identify a range of
site formation processes, e.g.: bone to indicate presence of rats.

The data for the artefacts recovered at the Commissariat Store site is presented as counts of
artefacts, rather than measures such as weight or minimum number of individuals (MNI).
Counts are commonly used as a measure of artefacts in historical archaeological sites (e.g.
Connah 1994; Connah et al. 1978; Fredericksen 2001; King and Miller 1991; Prangnell
1999) and were consistently entered in the artefact database for the finds recovered from the
Commissariat Store site. Weights were entered for only a limited number of artefact types
for the site, such as metal nails and animal bone, but these were not weighed consistently for
the entire category of artefacts. MNI is a commonly used measure for faunal material in
historical archaeological sites (e.g. Connah 1994; Howell-Meurs 2000), however, it was not
used as a measure in this instance for the animal bone recovered due to the size of the
collection, the incomplete analysis of the faunal material and the limited scope of this thesis.

Overview
A total of 38,035 artefacts were recovered from the excavation, including the contents of the
drain, on the ground floor of the Commissariat Store building. The artefacts comprised
materials including bone, brick/mortar, ceramic, chalk, charcoal, chemical substances, cork,
fibres, glass, leather, metal, paper, plastic, rubber, seeds, shell/coral, soil, sulphur and wood
(Table 6).
Table 6: Number of artefacts by type of material by SU.

<table>
<thead>
<tr>
<th>Material</th>
<th>SUI</th>
<th>SUI/II</th>
<th>SUII</th>
<th>SUIII</th>
<th>SUII/III</th>
<th>SUII/IV/V</th>
<th>SUIII/V</th>
<th>SUV</th>
<th>SUV/VI</th>
<th>SUVI</th>
<th>SU nd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone</td>
<td>219</td>
<td>168</td>
<td>309</td>
<td>42</td>
<td>291</td>
<td>23</td>
<td>0</td>
<td>47</td>
<td>110</td>
<td>76</td>
<td>2370</td>
</tr>
<tr>
<td>Brick, Mortar etc</td>
<td>126</td>
<td>62</td>
<td>47</td>
<td>11</td>
<td>94</td>
<td>4</td>
<td>35</td>
<td>22</td>
<td>79</td>
<td>10</td>
<td>236</td>
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<td>Ceramic</td>
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<td>380</td>
<td>345</td>
<td>56</td>
<td>320</td>
<td>16</td>
<td>0</td>
<td>22</td>
<td>47</td>
<td>26</td>
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<tr>
<td>Chalk</td>
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<td>61</td>
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<td>17</td>
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<td>7</td>
<td>0</td>
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<td>20</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>Charcoal</td>
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<td>11</td>
<td>43</td>
<td>6</td>
<td>15</td>
<td>1</td>
<td>0</td>
<td>9</td>
<td>7</td>
<td>15</td>
<td>229</td>
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<td>Chemical</td>
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<td>0</td>
<td>0</td>
<td>1</td>
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</tr>
<tr>
<td>Cork</td>
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<td>0</td>
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<td>Fibres</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Glass</td>
<td>2652</td>
<td>1211</td>
<td>912</td>
<td>153</td>
<td>406</td>
<td>15</td>
<td>0</td>
<td>52</td>
<td>108</td>
<td>34</td>
<td>1625</td>
</tr>
<tr>
<td>Leather</td>
<td>55</td>
<td>35</td>
<td>31</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Metal*</td>
<td>2212</td>
<td>937</td>
<td>1213</td>
<td>306</td>
<td>789</td>
<td>20</td>
<td>0</td>
<td>97</td>
<td>139</td>
<td>32</td>
<td>1499</td>
</tr>
<tr>
<td>Paper</td>
<td>342</td>
<td>113</td>
<td>50</td>
<td>16</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Plastic</td>
<td>764</td>
<td>107</td>
<td>49</td>
<td>25</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>60</td>
<td>5</td>
<td>176</td>
</tr>
<tr>
<td>Rubber</td>
<td>20</td>
<td>11</td>
<td>9</td>
<td>5</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Seeds</td>
<td>59</td>
<td>42</td>
<td>30</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Shell, coral</td>
<td>459</td>
<td>344</td>
<td>443</td>
<td>107</td>
<td>166</td>
<td>30</td>
<td>0</td>
<td>36</td>
<td>57</td>
<td>49</td>
<td>810</td>
</tr>
<tr>
<td>Soil</td>
<td>0</td>
<td>9</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Sulphur</td>
<td>41</td>
<td>37</td>
<td>105</td>
<td>12</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Wood</td>
<td>795</td>
<td>273</td>
<td>456</td>
<td>243</td>
<td>123</td>
<td>2</td>
<td>0</td>
<td>75</td>
<td>13</td>
<td>0</td>
<td>58</td>
</tr>
<tr>
<td>Other</td>
<td>19</td>
<td>10</td>
<td>9</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total Artefacts</strong></td>
<td><strong>8751</strong></td>
<td><strong>3907</strong></td>
<td><strong>4129</strong></td>
<td><strong>1057</strong></td>
<td><strong>2286</strong></td>
<td><strong>124</strong></td>
<td><strong>35</strong></td>
<td><strong>397</strong></td>
<td><strong>649</strong></td>
<td><strong>258</strong></td>
<td><strong>8262</strong></td>
</tr>
<tr>
<td>Counted nails</td>
<td>131</td>
<td>68</td>
<td>98</td>
<td>12</td>
<td>42</td>
<td>4</td>
<td>0</td>
<td>12</td>
<td>12</td>
<td>0</td>
<td>342</td>
</tr>
<tr>
<td>Weighed nails (g)</td>
<td>1691</td>
<td>1754</td>
<td>15278</td>
<td>1578</td>
<td>8505</td>
<td>633</td>
<td>0</td>
<td>735</td>
<td>3243</td>
<td>519</td>
<td>32106</td>
</tr>
</tbody>
</table>

*Excluding counted and weighed nails.
For the entire site the most frequently recovered materials were metal (Table 7) and glass (Table 8), each comprising 25% of the total artefacts recovered. The metal artefacts consisted of a wide range of objects including metal buttons, coins, nails, screws, weaponry and wire. The glass artefacts also consisted of a range of object types including glass beads, bottle glass, glass buttons and window glass.

The next most frequent artefact materials recovered at the site were bone (11%), ceramic (10%), shell/coral (8%) and wood (8%). The bone recovered (4074) consisted mainly of bird, cow, fish, rat, sheep, and others yet to be identified. The remainder of the bone objects were buttons (20). Pieces of clay smoking pipes were clearly identified from the ceramic recovered from the site, while the remainder of the collection requires further classification. The clay pipe pieces consist of 9% of the total ceramic collection (Table 9). The shell/coral artefacts consisted of 74 shell buttons and 2959 shell or coral pieces (Table 10). The only classification made of the wooden artefacts was to identify the wooden buttons recovered. The collection of wooden artefacts consisted of seven wooden buttons from a total of 2875 wooden items.

**Artefacts by SU**

The most frequent artefacts in SUI were glass (30%) and metal (25%) objects, followed by wood (9%), plastic (9%) and ceramic (7%) (Figure 24). (This data does not include nails due to the inconsistency of the measurement of these artefacts). SUII’s most frequent artefacts were metal (29%) and glass (22%), followed by shell/coral (11%), wood (11%), ceramic (8%) and bone (7%). The combination SUI/II displays a very similar proportion of material types with glass (31%) and metal (24%) being the most frequent materials recovered. The most frequent artefacts in SUIII were again metal (35%) and glass (18%), followed closely by ceramic (14%) and bone (13%). The combination SUII/III reveals a different pattern, with wood artefacts being the second most frequent with 23%, following metal as most frequent at 29%. The combinations SUI/III/V and SUII/IV/V show different patterns, however only small numbers of artefacts (124 and 35 respectively) were recovered from these SUs. The combination SUIII/V shows a similar proportion of material types as SUII/III with metal (24%) and wood (19%) being the two most frequent. SUV’s most frequent artefacts were metal (21%), glass (17%) and bone (17%). The frequency of bone increases in SUVI with it being the most frequent (29%), followed by glass (20%), metal (18%) and ceramic (14%).
Table 7: Breakdown of metal artefacts by object type for each SU.

<table>
<thead>
<tr>
<th></th>
<th>Metal buttons</th>
<th>Coins</th>
<th>Screws</th>
<th>Weapons</th>
<th>Wire</th>
<th>Not otherwise classified</th>
<th>Total numbers (excluding nails)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUI</td>
<td>21</td>
<td>10</td>
<td>35</td>
<td>4</td>
<td>222</td>
<td>1920</td>
<td>2212</td>
</tr>
<tr>
<td>SUI/II</td>
<td>6</td>
<td>6</td>
<td>13</td>
<td>4</td>
<td>107</td>
<td>801</td>
<td>937</td>
</tr>
<tr>
<td>SUII</td>
<td>9</td>
<td>1</td>
<td>8</td>
<td>3</td>
<td>41</td>
<td>1151</td>
<td>1213</td>
</tr>
<tr>
<td>SUIII</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>283</td>
<td>306</td>
</tr>
<tr>
<td>SUIII</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>778</td>
<td>789</td>
</tr>
<tr>
<td>SUIII/III/V</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>SUIII/IV/V</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SUII/V</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>94</td>
<td>97</td>
</tr>
<tr>
<td>SUV</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>132</td>
<td>139</td>
</tr>
<tr>
<td>SUV/VI</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>27</td>
<td>32</td>
</tr>
<tr>
<td>SUVI</td>
<td>14</td>
<td>6</td>
<td>4</td>
<td>10</td>
<td>41</td>
<td>1424</td>
<td>1499</td>
</tr>
<tr>
<td>SU nd</td>
<td>20</td>
<td>15</td>
<td>25</td>
<td>2</td>
<td>97</td>
<td>2107</td>
<td>2266</td>
</tr>
<tr>
<td>Total</td>
<td>81</td>
<td>44</td>
<td>89</td>
<td>28</td>
<td>531</td>
<td>8737</td>
<td>9510</td>
</tr>
</tbody>
</table>

Table 8: Breakdown of glass artefacts by object type for each SU.

<table>
<thead>
<tr>
<th></th>
<th>Glass beads</th>
<th>Bottle glass</th>
<th>Glass buttons</th>
<th>Window glass</th>
<th>Not otherwise classified</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUI</td>
<td>19</td>
<td>267</td>
<td>10</td>
<td>36</td>
<td>2320</td>
<td>2652</td>
</tr>
<tr>
<td>SUI/II</td>
<td>1</td>
<td>185</td>
<td>7</td>
<td>62</td>
<td>956</td>
<td>1211</td>
</tr>
<tr>
<td>SUII</td>
<td>0</td>
<td>226</td>
<td>6</td>
<td>0</td>
<td>680</td>
<td>912</td>
</tr>
<tr>
<td>SUIII</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>145</td>
<td>153</td>
</tr>
<tr>
<td>SUIII</td>
<td>0</td>
<td>137</td>
<td>2</td>
<td>0</td>
<td>267</td>
<td>406</td>
</tr>
<tr>
<td>SUII/III/V</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>SUII/IV/V</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SUII/V</td>
<td>0</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>32</td>
<td>52</td>
</tr>
<tr>
<td>SUV</td>
<td>0</td>
<td>14</td>
<td>0</td>
<td>7</td>
<td>87</td>
<td>108</td>
</tr>
<tr>
<td>SUV/VI</td>
<td>0</td>
<td>26</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>34</td>
</tr>
<tr>
<td>SUVI</td>
<td>2</td>
<td>795</td>
<td>7</td>
<td>5</td>
<td>816</td>
<td>1625</td>
</tr>
<tr>
<td>SU nd</td>
<td>1</td>
<td>573</td>
<td>9</td>
<td>20</td>
<td>1623</td>
<td>2226</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>2247</td>
<td>46</td>
<td>130</td>
<td>6948</td>
<td>9394</td>
</tr>
</tbody>
</table>
Table 9: Breakdown of ceramic artefacts for each SU.

<table>
<thead>
<tr>
<th>SU</th>
<th>Clay Pipe pieces</th>
<th>Ceramic buttons</th>
<th>Not otherwise classified</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUI</td>
<td>49</td>
<td>3</td>
<td>591</td>
<td>643</td>
</tr>
<tr>
<td>SUI/II</td>
<td>47</td>
<td>1</td>
<td>332</td>
<td>380</td>
</tr>
<tr>
<td>SUII</td>
<td>23</td>
<td>0</td>
<td>322</td>
<td>345</td>
</tr>
<tr>
<td>SUIII</td>
<td>9</td>
<td>0</td>
<td>47</td>
<td>56</td>
</tr>
<tr>
<td>SUIII</td>
<td>38</td>
<td>0</td>
<td>282</td>
<td>320</td>
</tr>
<tr>
<td>SUIII/III/V</td>
<td>3</td>
<td>0</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>SUIII/I/V</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SUIII/V</td>
<td>1</td>
<td>0</td>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>SUV</td>
<td>3</td>
<td>0</td>
<td>44</td>
<td>47</td>
</tr>
<tr>
<td>SUV/VI</td>
<td>7</td>
<td>0</td>
<td>19</td>
<td>26</td>
</tr>
<tr>
<td>SUVI</td>
<td>123</td>
<td>0</td>
<td>1069</td>
<td>1192</td>
</tr>
<tr>
<td>SU nd</td>
<td>46</td>
<td>1</td>
<td>664</td>
<td>711</td>
</tr>
<tr>
<td>Total</td>
<td>349</td>
<td>5</td>
<td>3404</td>
<td>3758</td>
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</table>

Table 10: Breakdown of shell/coral artefacts for each SU.

<table>
<thead>
<tr>
<th>SU</th>
<th>Shell buttons</th>
<th>Shells, coral pieces</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUI</td>
<td>13</td>
<td>446</td>
<td>459</td>
</tr>
<tr>
<td>SUI/II</td>
<td>7</td>
<td>337</td>
<td>344</td>
</tr>
<tr>
<td>SUII</td>
<td>9</td>
<td>434</td>
<td>443</td>
</tr>
<tr>
<td>SUIII</td>
<td>3</td>
<td>104</td>
<td>107</td>
</tr>
<tr>
<td>SUIII</td>
<td>2</td>
<td>164</td>
<td>166</td>
</tr>
<tr>
<td>SUIII/III/V</td>
<td>0</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>SUIII/I/V</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SUIII/V</td>
<td>0</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>SUV</td>
<td>2</td>
<td>55</td>
<td>57</td>
</tr>
<tr>
<td>SUV/VI</td>
<td>0</td>
<td>49</td>
<td>49</td>
</tr>
<tr>
<td>SUVI</td>
<td>21</td>
<td>789</td>
<td>810</td>
</tr>
<tr>
<td>SU nd</td>
<td>17</td>
<td>515</td>
<td>532</td>
</tr>
<tr>
<td>Total</td>
<td>74</td>
<td>2959</td>
<td>3033</td>
</tr>
</tbody>
</table>
Figure 24: Numbers of artefacts by material for each SU.
* Excluding nails
Buttons
A total of 304 buttons were recovered from the excavation of the ground floor of the Commissariat Store (Table 11). The most frequent materials found are metal (27%), shell (24%), plastic (23%) and glass (16%), with small numbers of bone (7%), wood (2%) and ceramic (2%). There are a wide variety of types, sizes, shapes, attachments and appearance both within and between each material type, however most of the assemblage may be described as utilitarian rather than decorative (Woodhouse n.d.-c:1). There is a difference in the distribution of plastic buttons through the depth of the site, in comparison to shell buttons (Figure 25). Forty-three percent of the plastic buttons (with known stratigraphic locations) recovered in the site were found in SUI, with 24% recovered from SUVI. Shell buttons display the reverse distribution with a greater proportion (36%) being recovered from SUVI as compared to SUI (23%). The buttons were recovered across most of the site except for the northwest corner of the building and along the southern wall. Concentrations of buttons were found in the grid units at the junction of the northern transverse drain and the junction of the southern transverse drain (Figure 26).

![Figure 25: Proportion of material type in each SU.](image-url)
Table 11: Numbers of buttons recovered by SU and material type.

<table>
<thead>
<tr>
<th></th>
<th>Bone</th>
<th>Ceramic</th>
<th>Glass</th>
<th>Metal</th>
<th>Plastic</th>
<th>Shell</th>
<th>Wood</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUI</td>
<td>3</td>
<td>3</td>
<td>10</td>
<td>21</td>
<td>25</td>
<td>13</td>
<td>1</td>
<td>76</td>
</tr>
<tr>
<td>SUI/II</td>
<td>4</td>
<td>1</td>
<td>7</td>
<td>6</td>
<td>8</td>
<td>7</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>SUII</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>9</td>
<td>3</td>
<td>9</td>
<td>2</td>
<td>29</td>
</tr>
<tr>
<td>SUI/III</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>SUIII</td>
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<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>SUII/III/V</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SUII/IV/V</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SUIII/V</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>SUV</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
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<td>6</td>
</tr>
<tr>
<td>SUV/VI</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>SUVI</td>
<td>9</td>
<td>0</td>
<td>7</td>
<td>14</td>
<td>14</td>
<td>21</td>
<td>2</td>
<td>67</td>
</tr>
<tr>
<td>SU nd</td>
<td>4</td>
<td>1</td>
<td>9</td>
<td>20</td>
<td>13</td>
<td>17</td>
<td>1</td>
<td>65</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>5</td>
<td>46</td>
<td>81</td>
<td>71</td>
<td>74</td>
<td>7</td>
<td>304</td>
</tr>
</tbody>
</table>

Figure 26: Distribution of buttons for all SUs.
The metal buttons recovered are generally stamp-cut from copper or metal alloy, similar to those used from the 1850s onwards for uniform trouser, suspender and fly buttons (Woodhouse n.d.-a:1; n.d.-c:1). Some of the metal buttons bear inscriptions including “SUSPENDERS”, “BEST RING EDGE”, and “SOLID RING EDGE” and are similar to those found at the Cumberland/Gloucester Street site in The Rocks area of Sydney (Woodhouse n.d.-c:1). Other metal buttons are inscribed “R.A. & J. KINGSFORD, BRISBANE”, with Kingsfords having owned drapery businesses in Queen Street, Brisbane and in Gympie from 1859 to 1873 (Woodhouse n.d.-c:1). Another two-piece metal button, recovered in SUI/II, was inscribed with the words “QUEENSLAND POLICE FORCE” and a King’s Crown on one side, and “A.J. PARKS. BRISBANE” on the reverse side. Parks have manufactured Queensland Police buttons from 1893 to the present day, however as the Crown is identified as belonging to a King it would only have been manufactured after the coronation of King Edward VIII in 1902 (Woodhouse n.d.-c:2).

Shell buttons were mass produced and most popular from the mid 1800s, however the variety of types, style, hole shape and placement, button shape and colours limit the ability to identify any pattern in their distribution (Woodhouse n.d.-a:1). Some of the plastic buttons were identified as being manufactured from casein, datable from 1820s onwards (Mackay 1975), with the remainder being dated after 1940 with the increasing use of plastics (Woodhouse n.d.-a:1). Pressed glass and ceramic buttons were most popular after 1840, with ten of those found in this site being similarly decorative, rounded, small, shanked, ivory coloured buttons. Most of the other glass/ceramic buttons were identified as shirt buttons (Woodhouse n.d.-b:1).

**Clay Pipes**

Clay tobacco pipes used in Australia from 1788 onwards conformed to a basic shape with a hemispherical or egg-shaped bowl on top of a tapering generally straight stem between 75 and 150 millimetres long (Gojak and Stuart 1999:38). Fine ballclay was generally used to make clay pipes, with the finished product fired to a white or cream colour (Gojak and Stuart 1999:38). A total of 343 pieces of clay pipes were recovered from the Commissariat Store site (Table 12). The most frequent piece of the clay pipes found were stem or mouthpieces (44%), followed by bowls (34%), with 22% comprising a combination of these parts.
The distribution of clay pipe pieces (with known stratigraphic locations) throughout the depth of the site appears to be evenly distributed between SUI and SUII (40%) and SUVI (41%). Pieces of clay pipe were recovered across most of the site apart from the northwest corner and along the southern wall of the building, with two areas of concentration as follows (Figure 27):

- The intersection of the northern transverse drain with the main drain, with most pieces in SUVI; and
- The intersection of the southern transverse drain with the main drain, with pieces mostly in SUVI.

The use of clay pipes for smoking was popular in Australia from the first European settlement in 1788 until the late 19th century, when the popularity of cigarettes saw clay pipes rapidly decline with almost no use after World War One (Gojak and Stuart 1999:40). Clay pipes were typically associated with labourers, convicts and especially the Irish (Gojak and Stuart 1999:40). The vast majority of clay pipes were imported into the colony, predominantly from Scotland, particularly from the 1840s onwards (Gojak and Stuart 1999:43).

The majority of pieces of clay pipe recovered from the site show no evidence of carbonisation associated with burning tobacco (Woodhouse n.d.-e:1). Of the stem pieces 14% have the maker’s name impressed into them with all but three being manufactured in Scotland (Woodhouse n.d.-e:1). Four of the identifiable stem pieces are of a type custom-made for Dixon, a Sydney tobacconist who imported clay pipes from Scotland during the 1830s (Woodhouse n.d.-e:1). The bowl pieces recovered display a variety of shapes, sizes, thickness and decoration. Of 19 identified pieces, seven are unused with thin walls, stems and are highly decorative, including three “Squatters Budgeree” types which were designed for the Australian market by Thomas White of Scotland between 1837 and 1882 (Woodhouse n.d.-e:1). The remaining 12 identified bowl pieces are of the “Cutty” or “Dundeen” style with thick walls, short stubby stem and an upright bowl to enable smoking while labouring (Woodhouse n.d.-e:1). Eight of these 12 show evidence of having been smoked.
Table 12: Number of clay pipe pieces recovered by SU and piece type.

<table>
<thead>
<tr>
<th></th>
<th>Bowls</th>
<th>Stems/Mouthpieces</th>
<th>Combinations</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUI</td>
<td>15</td>
<td>21</td>
<td>13</td>
<td>49</td>
</tr>
<tr>
<td>SUI/II</td>
<td>23</td>
<td>18</td>
<td>5</td>
<td>46</td>
</tr>
<tr>
<td>SUII</td>
<td>6</td>
<td>13</td>
<td>4</td>
<td>23</td>
</tr>
<tr>
<td>SUIII</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>SUIII/I</td>
<td>13</td>
<td>18</td>
<td>5</td>
<td>36</td>
</tr>
<tr>
<td>SUIII/V</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>SUIII/IV</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SUIII/V</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>SUV</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>SUV/VI</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>SUV</td>
<td>36</td>
<td>46</td>
<td>38</td>
<td>120</td>
</tr>
<tr>
<td>SU nd</td>
<td>14</td>
<td>24</td>
<td>8</td>
<td>46</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>152</td>
<td>75</td>
<td>343</td>
</tr>
</tbody>
</table>

Figure 27: Distribution of clay pipe pieces for all SUs.
Under the boards

**Coins**

A total of 44 coins were recovered from the excavated areas of the Commissariat Store site (Table 13). Of the coins recovered, 55% were Australian pre-decimal currency, 16% Australian decimal currency and 16% pre-1910 British currency. Most of the coins with known stratigraphic locations were recovered from SUI and SUII (59%) and SUVI (21%).

The coins appear to be distributed across the site, apart from the absence of coins recovered from the northwest corner of the building, the recovery of only one coin in the northern third of the building, and one coin from the southwest corner (Figure 28). The majority of the coins from the site are of low denominations, with 3d pieces being the most frequent (13) (Woodhouse n.d.-f:2).

<table>
<thead>
<tr>
<th>SU</th>
<th>Pre-1910 British Currency</th>
<th>1911-1965 Australian Pre-decimal Currency</th>
<th>1966-1978 Australian Decimal Currency</th>
<th>Unknown Date</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUI</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>SUI/II</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>SUII</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>SUII/III</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>SUIII</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>SUII/III/V</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SUIII/IV/V</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SUIII/V</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>SUV</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>SUVI/VI</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SUVI</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>SU nd</td>
<td>1</td>
<td>9</td>
<td>3</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>24</td>
<td>7</td>
<td>10</td>
<td>44</td>
</tr>
</tbody>
</table>

Figure 28: Distribution of coins for all SUs.
Weapon-related Artefacts
There were 34 artefacts recovered from the excavated area of the Commissariat Store site classified as weapon-related artefacts (Table 14). These include metal cartridge cases, shell cases, lead and bronze bullets, small lead shot and cotton wads used in both muzzle loading and cartridge filling for breech loaders (Woodhouse n.d.-d:1). The majority of the artefacts were recovered from either SUI, II and III (63%) or SUVI (34%). The horizontal distribution shows most artefacts concentrated in two distinct areas of the site (Figure 29):

- The northern part of the drain (with all artefacts from SUVI recovered in this area);
- Near the western wall of the building in grid units D6, E6-7, F7 and G7, with most of these artefacts recovered from SUI and SUII.

Twelve items have been identified as being fragments of pin fire cartridges from Westley Richards and Co carbines, which were available in the settlement from 1867 until 1870 (Robinson 1997:35-38). Nine of these fragments were located in the northern part of the drain SUV and SUVI, two fragments near the western wall in GU E7, SUII and one fragment from an unknown stratigraphic location in GU C15 (Figure 29).

Bones
A total of 4074 animal bones were recovered from the excavation of the ground floor (Table 15). A full analysis and identification of the animal bones by animal type has not been undertaken to date. The following numbers are based on the description of the bones recorded during and after excavation and entered into the database. Some finds were recorded with multiple types of animal bones in the one database record making it difficult to classify each find by a singular animal type. These are classified below in the category of “Other (mixed)”.

Of all bones, the most frequent animal type found was rat (34% of total bone), followed by sheep (7%), fish (2%) and cow (1%). Examination of the descriptions of bone recovered reveals a wide range of types of bones including long bones, ribs, jaws, teeth, pelvis, vertebrae, skull, scapula and clavicle. The bones are often in fragments and are described as sawn, cut, broken, and chewed or gnawed (possibly by rats).
Table 14: Numbers of weapon-related artefacts recovered by XU.

<table>
<thead>
<tr>
<th>Weapon-related artefacts</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SUI</td>
<td>7</td>
</tr>
<tr>
<td>SUI/II</td>
<td>4</td>
</tr>
<tr>
<td>SUII</td>
<td>4</td>
</tr>
<tr>
<td>SUIII</td>
<td>4</td>
</tr>
<tr>
<td>SUIII/III</td>
<td>4</td>
</tr>
<tr>
<td>SUIII/IV/V</td>
<td>0</td>
</tr>
<tr>
<td>SUIII/V</td>
<td>0</td>
</tr>
<tr>
<td>SUV</td>
<td>1</td>
</tr>
<tr>
<td>SUV/VI</td>
<td>0</td>
</tr>
<tr>
<td>SU VI</td>
<td>10</td>
</tr>
<tr>
<td>SU nd</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>34</td>
</tr>
</tbody>
</table>

Figure 29: Distribution of weapon-related artefacts for all SUs.
The distribution of bone through the depth of the site shows that the majority of bone (65%) was recovered in SUVI. The horizontal distribution of bone across the site shows a number of areas of concentration (Figure 30):

- The south west corner of the building, with highest numbers in GUs D6, D7, D8, E6, and E7, in SUI, II and III, overlying and adjacent to a rats’ nest in GU E6, SUIII;
- The northern transverse drain and its intersection with the main drain, with most recovered from SUVI;
- The southern transverse drain and its intersection with the main drain, mainly in SUVI; and
- The western end of the southern transverse drain in SUIII and SUV, in GUs D13, D14 and E14 along with two rats’ nests in GU E13 and E14 in the same SUs, and an adjacent rats nest in GU F14.

Table 15: Numbers of animal bones recovered by SU and animal type.

<table>
<thead>
<tr>
<th></th>
<th>Bird</th>
<th>Cow</th>
<th>Fish/crustacean</th>
<th>Rat</th>
<th>Sheep</th>
<th>Other (mixed)</th>
<th>Unknown</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUI</td>
<td>2</td>
<td>10</td>
<td>5</td>
<td>54</td>
<td>35</td>
<td>21</td>
<td>89</td>
<td>216</td>
</tr>
<tr>
<td>SUI/II</td>
<td>0</td>
<td>5</td>
<td>4</td>
<td>11</td>
<td>49</td>
<td>18</td>
<td>77</td>
<td>164</td>
</tr>
<tr>
<td>SUII</td>
<td>2</td>
<td>0</td>
<td>24</td>
<td>113</td>
<td>19</td>
<td>55</td>
<td>96</td>
<td>309</td>
</tr>
<tr>
<td>SUII/III</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>31</td>
<td>67</td>
<td>309</td>
</tr>
<tr>
<td>SUIII</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>170</td>
<td>22</td>
<td>9</td>
<td>47</td>
<td>291</td>
</tr>
<tr>
<td>SUII/III/V</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>19</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>SUII/IV/V</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SUII/V</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>13</td>
<td>5</td>
<td>15</td>
<td>9</td>
<td>47</td>
</tr>
<tr>
<td>SUV</td>
<td>0</td>
<td>24</td>
<td>0</td>
<td>31</td>
<td>0</td>
<td>0</td>
<td>55</td>
<td>110</td>
</tr>
<tr>
<td>SUVI/V</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>17</td>
<td>0</td>
<td>0</td>
<td>58</td>
<td>76</td>
</tr>
<tr>
<td>SUVI</td>
<td>0</td>
<td>9</td>
<td>15</td>
<td>866</td>
<td>61</td>
<td>505</td>
<td>905</td>
<td>2361</td>
</tr>
<tr>
<td>SU nd</td>
<td>0</td>
<td>1</td>
<td>7</td>
<td>100</td>
<td>99</td>
<td>95</td>
<td>133</td>
<td>435</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>50</td>
<td>67</td>
<td>1375</td>
<td>269</td>
<td>781</td>
<td>1528</td>
<td>4074</td>
</tr>
</tbody>
</table>
Summary

The archaeological excavation of the Commissariat Store in 1978/79 identified seven stratigraphic units, a number of archaeological features, including evidence of the original flagstone flooring and a substantial brick-lined sub-floor drainage system and a total of 38,035 artefacts. A focus on a small number of these artefact classes including buttons, clay pipes, coins, weapon-related artefacts and bones, in conjunction with an analysis of the stratigraphic units and archaeological features, will enable the identification of the site formation processes detailed in the next chapter.
CHAPTER 5 – ANALYSIS AND DISCUSSION

Introduction
The cultural and non-cultural site formation processes at the Commissariat Store site were identified by analysing the stratigraphy, sediments, artefacts and historical evidence. The site is divided into four units of analysis based upon observable changes in the archaeological record, and provides a logical basis for the analysis and description of the formation processes for each unit. The analysis of the site formation processes provides an explanation of the formation of the archaeological site at the Commissariat Store.

Data Analysis
The issues with and limitations of the archaeological data were identified in detail in Chapter 4. As outlined in Chapter 2, the deposit is the most appropriate unit of analysis for identifying site formation processes. Schiffer’s (1987:265) definition of a deposit – a segment of a site distinguishable on the basis of observable changes in sediments and artefacts – is used in my analysis. In addition, I consider the historical evidence and the expected impacts of the activities on the formation of the archaeological record. On this basis, the archaeology at the Commissariat Store is divided into four analytical units (AU) (Table 16). As detailed in Chapter 2, formation processes can be identified from the properties of artefacts and sediments found at the site. The terminology for the cultural formation processes identified are as outlined in Table 1, Chapter 2, based on Schiffer’s work (1972; 1976; 1987), while for non-cultural formation processes the terminology is based upon a range of authors, including Schiffer (1987) and Wood and Johnson (1978) as outlined in Chapter 2. The formulation of the AUs for the Commissariat Store was undertaken by examining three sets of data:

- The stratigraphy and sediments – identifying the processes likely to have formed each of the stratigraphic units;
- The artefacts – the properties of the artefacts themselves, their horizontal and vertical distribution, and how these fit with the stratigraphy; and
- The historical evidence – the expected impacts of historical activities on the formation of the archaeological record, and the relationship to the stratigraphy and artefacts.
Table 16: Identified analytical units at the Commissariat Store site, and their associated stratigraphic units and formation processes.

<table>
<thead>
<tr>
<th>Analytical Unit (AU)</th>
<th>Stratigraphic Unit (SU)</th>
<th>Formation Processes Identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>AU1</td>
<td>SUI</td>
<td>Discard, Loss, Faunalturbation, Floralturbation</td>
</tr>
<tr>
<td>AU2</td>
<td>SUII</td>
<td>Flooding, Faunalturbation</td>
</tr>
<tr>
<td>AU3</td>
<td>SUIII, SUIV, SUV, SUVII</td>
<td>Construction, Faunalturbation</td>
</tr>
<tr>
<td>AU4</td>
<td>SUVI</td>
<td>Aquaturbation</td>
</tr>
</tbody>
</table>

**Identification of Site Formation Processes**

**AU1 – Discard, Loss, Faunalturbation, and Floralturbation**

*Stratigraphy*

AU1 consists of SUI which is continuous across most of the site. The greyish brown, loose friable soil mixed with straw, mortar and nails, indicates a cultural formation process which sees materials transferred from the systemic context to the archaeological context. The formation of SUI appears to be a continuous process throughout the history of the Commissariat Store. SUI overlies SUs clearly related to the construction of the building across most of the site. Where SUI does not appear, the mix of inclusions, such as straw, mortar and nails appears on the surface of SUII. The composition of the sediment in SUI appears to indicate the discard process of maintenance, which includes sweeping. This activity is likely to have been undertaken across the entire timber floor of the Commissariat Store with dust, dirt, straw, and other small items being swept through the floorboards and becoming part of the archaeological record. Prior to the installation of the timber floor, it appears that dust, dirt, straw and other small items may have been discarded or simply left in place on the floor, given Buckley’s 1861 description of the “highly objectionable” conditions of the “damp earth” floor (QSA SRS5253 1861:66) and the possibly less importance placed on maintenance processes. There is no clear evidence in SUI of the processes prior to the installation of the timber floor, given the disturbance in its construction and the removal of the original stone flooring, discussed below in AU3.
The non-cultural formation process of faunalturbation is present in SUI. A number of fig tree roots were found intruding into GU K6 near the western wall of the Commissariat Store. The roots may have disturbed small artefacts and the sediment of SUI, however there is no evidence of this in the archaeological documentation.

**Artefacts**

The most frequent artefacts recovered from AU1 were metal and glass objects. The presence of glass, including a high proportion of bottle glass, is consistent with the process of maintenance given the long term use of the site for storage of items, and the likely use of glass storage containers. The presence of glass is also consistent with the use of the Store by immigrants as temporary accommodation and the likelihood of the possession of glass containers and bottles. Breakage of glass, followed by sweeping would account for the presence of glass in the site. The presence of metal items is also consistent with the process of maintenance given the long term use of the site for the storage of metal items including nails, screws, paperclips, pins and other items. The spillage of small metal items, followed either by sweeping, or simply loss through the floorboards of the Store would account for their presence in AU1.

A high proportion of the buttons recovered from the site were located in AU1. The presence of buttons of all material types recovered from the site – from early materials such as bone, ceramic and glass through to more recent materials such as plastic – indicates the continuous nature of the process of discard and loss in AU1. Again, the presence of such items in the archaeological record can be accounted by the use of the site to store such items over a long period, and the presence of persons living and working in the Store throughout its history. Given the wide variety of types of buttons recovered and their small size, the process of discard through loss explains their presence in the archaeological record.

Pieces of clay pipes including bowls, stems and mouthpieces were recovered from AU1. Most of the clay pipe pieces recovered from the site showed no evidence of use indicating the likelihood of the breakage of items stored in the building and then swept up or swept through the floorboards. The small number of pipe bowls showing evidence of having been smoked were of a style able to be used while labouring and may be associated with either workers in the Store or immigrants accommodated in the Store.
A small number of coins were recovered from AU1. The presence of such items is likely to be due to the process of loss, due to their small size, and the difficulty in recovering the coin from beneath the floorboards. Australian pre-decimal coins were the most common found in AU1 dating from 1911 to 1965 during which time the Store was used mainly for storage or office accommodation. The presence of workers in the Store likely accounts for the presence of coins in the archaeological record.

A small number of weapon-related artefacts including cartridge cases, bullets, shot and wads were recovered in AU1. Some were located in the southwest corner of the building in GU D7, while the others were located in the area above the junction of the southern transverse drain in GU E16-18. The presence of such items can be accounted for by the use of the Store for the storage of ammunition at least until 1900. The small size of the items is also a contributing factor to their presence in the archaeological record either through loss or discard through spillage of stored items and sweeping.

The size of many of the artefacts recovered would enable them to pass through the narrow gaps between the floorboards. Some of the larger artefacts recovered (such as clay pipe bowls) would not be likely to fit between the floorboards. Their presence in the archaeological record may have occurred during the repeated repairs to the timber floor. The removal and replacement of floorboards would provide the opportunity for larger items to be incorporated into the archaeological record. Without a detailed recording of the pattern and timing of repairs to the floorboards, it is difficult to analyse the association with the patterning of the artefacts.

A substantial number of animal bones were also recovered from AU1. The presence of rat bones indicates the non-cultural formation process of faunal turbaration at the Commissariat Store site. Evidence of chewing and gnawing marks on non-rat bones recovered from the site provides artefact level evidence of the activity of rats. A number of rats’ nests were also revealed in the excavation of the site. The presence of rats throughout the history of the Store is also recorded. This evidence appears to indicate the activity of rats in disturbing sediments by creating nests, and in the movement of bones into the site. Given the widespread pattern of animal bone across the site, it does not appear that the presence of bones is due to the cultural process of discard of food waste. The kitchen building of 1857 was located in the yard of the Commissariat Store, and later moved to adjacent land in 1886, and it is likely that any animal bone food waste would be recovered external to those
buildings, rather than within the confines of the Store itself. High numbers of bones from AU1 were recovered in the southwest corner of the building in GU D6-7, adjacent to and overlying a rats’ nest in GU E6. A concentration of bone recovered on the northern wall in AU1 in GU L11 and K11-12 may also be associated with two rats’ nests found in GU K11 in AU1.

**Processes**

Both cultural and non-cultural formation processes can be identified in AU1. The cultural S-A (systemic to archaeological) process of discard is identifiable in AU1, with the sub-processes of primary refuse and maintenance processes prevalent. The cultural deposition process of loss is also identifiable in AU1, where items have unexpectedly entered the archaeological record. The non-cultural formation processes of faunalturbation (animals) and floralturbation (plants) are also identifiable in AU1. These processes appear to be continuous through the history of the Commissariat Store.

**AU2 – Flooding and Faunalturbation**

**Stratigraphy**

AU2 consists of SUII which appears across most of the site and consists of a fine, brown silt. As indicated by Schiffer (1987:233) and Turnbaugh (1978) the flow of water, particularly that moving at a slow rate inside the building, would transport small, lightweight particles such as silt into the site. Historical evidence reveals floodwaters entered the Commissariat Store building during the 1893 flooding of the Brisbane River. Given that the height of this flood was well above any recorded since the construction of the Commissariat Store, it is likely that this flood event is the process which formed SUII.

The pattern of distribution of SUII provides some indication of the likely pattern of movement of floodwater in the building. Generally SUII underlies SUI, except for the southwest corner and along the western wall of the building where it appears on the surface of the site. Of particular note is GU D6 and D7 where SUII actually overlies sediment of similar description to SUI. The movement of the water from the likely entry point of the double doors in the southern, river-side of the building would see higher velocity in the centre of the building as it enters, and moves towards the northern wall, with a lower velocity likely in the southwest and southeast corners of the building. The underfloor drainage system may also have impacted on the flow of the floodwater, with the waters possibly entering the building by coming up through the drain from the river and moving out from the
centre of the building. This movement of water would also see a difference in velocity, from
the higher velocity in the centre of the building to a lower velocity at the western and eastern
walls. The recession of the floodwaters would also have seen a difference in velocity in
various parts of the building, with higher velocity likely in the centre of the building with
water receding through the underfloor drain and the double doors in the centre of the
southern wall.

The differences in velocity of the water are likely to have effected the pattern of deposit of
silt carried in the water. The higher velocity water and silt is likely to have washed away the
SUI being continuously formed at the site or incorporated SUI within the silt and water
forming SUII. The lower velocity water and silt appears to have simply capped SUI,
particular in the southwest corner of the building in GU D6 and D7. Unfortunately the
southeast corner of the building was not excavated to provide further evidence of this
pattern.

Artefacts
The most frequent artefacts recovered in AU2 were glass and metal objects, as for AU1.
Although the proportion of artefact material types were similar for AU1 and AU2, the actual
numbers of artefacts recovered from AU2 were around half of those recovered in AU1. This
would seem to support the process of the silt from the floodwater incorporating the sediment
and artefacts in AU1 already laid down at the site prior to 1893, by the processes outlined in
AU1. The artefacts recovered from AU2 support the likelihood of the stratigraphic unit
being formed by the process of the 1893 flood of the Brisbane River.

A metal button inscribed with the words “R.A. & J. KINGSFORD, BRISBANE”, was
recovered from AU2 in GU E15, and has been identified as being from the Kingsford’s
drapery business operating in Brisbane from 1859 to 1873. Although the button may have
been deposited in the archaeological record at any time after 1859, the likelihood of the
buttons either being stored for distribution or worn on clothing by persons in the
Commissariat Store for a long period after 1873 is low. The position of the button supports
the proposal of it being deposited in the archaeological record before 1893, and subsequently
incorporated into AU2 during the 1893 flood. A metal police button manufactured by A. J.
Parks depicting a King’s crown was recovered from AU1/2 in GU F10. Parks having only
manufactured police buttons after 1893, and with the coronation of King Edward VIII being
the first king after 1893, the button must have been manufactured after 1902. Although not
conclusively reflected in the stratigraphic position due to the combination of AU5s in GU F10, the button could only have been deposited after the 1893 flood and likely appears in the top of AU2 or in AU1. A very small number of plastic buttons were recovered from AU2, compared to AU1. Although some of the plastic buttons recovered from the site were identified as being made from casein (dated from the 1820s onwards), the majority are dated to after 1940. The relative numbers of plastic buttons recovered in AU2 further supports the formation of AU2 prior to 1940, and most likely during the 1893 flood.

A small number of clay pipe pieces were recovered from AU2. It is not possible however to discern which of the clay pipe pieces from the combined AU1/2 were actually recovered from AU2. The use of clay smoking pipes would have occurred from the commencement of the Moreton Bay settlement, and were popular until the late 19th century. The clay pipe pieces recovered from AU2 may have entered the archaeological record prior to the 1893 flood and been incorporated into the silt of AU2 during the flood event. The pieces of clay pipe recovered in AU1 may be associated with use of pipes up until World War One.

A small number of fragments of pin fire cartridges from Westley Richards and Co carbines were recovered from the site, with two of these being recovered in GU E7, AU2. These weapons were only available in the settlement from 1867 until 1870 (Robinson 1997), with the ammunition also presumably not available or disposed of shortly after this time. Again this provides supporting evidence of the cartridges entering the archaeological record prior to the 1893 flood and being incorporated into AU2 during the flood event.

A high concentration of animal bones was recovered in the southwest corner of the building in AU2 (and AU1). This concentration of bone in AU2 may be the result of the abovementioned low velocity of floodwater in the southwest corner of the building incorporating the animal bone rather than washing it away. However, given the high concentration of bone at this location in both AU1 and AU2, it is also likely that it is due to the activity of rats in and around the rats’ nest in GU E6, AU3. A high number of bones were also recovered in GU E17, AU2, along with a rats’ nest in the same GU and AU. GU K14 and K16 also contained a high number of bones in AU2, which may possibly be associated with the adjacent two rats’ nests found in GU J14, in AU3 and an unidentified SU. The evidence of bones and rats’ nests provides strong evidence of the faunalturbation processes at work in AU2.
Processes

Non-cultural formation processes are identifiable in AU2. The process of the flooding of the Brisbane River has occurred at the regional scale but has identifiable effects at the site level. Although the regional process of flooding has occurred on a regular basis since the construction of the Commissariat Store, the site level effects appear to have been limited to a single flood event. The non-cultural formation process of faunalturbation appears in AU2 as a continuous process through the history of the site.

AU3 – Construction and Faunalturbation

Stratigraphy

AU3 consists of SUIII, SUIV, SUV and SUVII. SUIII consists of a mortar layer which was laid in order to set the porphyry flagstone flooring for the Commissariat Store. It appears from the patchy nature of the mortar that it has been disturbed when the original flagstones were removed in order to install the timber flooring. The flagstones appear to have subsequently been used to support the bearers of the timber floor. The mortar would have been highly disturbed during this process, and left open to subsequent deterioration particularly by flooding as described in AU2. One rats’ nest along the western wall of the building is likely to have caused disturbance to SUIII, with two nests at the western end of the southern transverse drain disturbing both SUII and SUV. A fourth rats’ nest is situated overlying a stone block at the western end of the northern transverse with evidence of it disturbing SUV, and likely extending through SUIII and SUII.

SUIV occurs adjacent to or above the drain and appears to be a bedding layer laid prior to the application of the mortar. SUV consists of fragments of phyllite rock similar to that found in SUVII. It appears that during the excavation of SUVII for the construction of the drain, the bedrock has been fragmented and used as fill around and over the drain. SUV appears also to have been used as fill around a supporting post elsewhere in the site. SUVII has been excavated in order to construct the drainage system. It appears that when the Store was constructed all sediment on the site was removed and excavated back to the bedrock.

Artefacts

The most frequently recovered artefacts in SUIII were metal objects, followed by glass, ceramic and bone. The metal objects may be associated with the construction of the timber floor. Objects may also have been incorporated into the disturbed SUIII during the removal of the original flagstones and construction of the timber floor. Artefacts laid down during
the processes described in AU1 may also have been incorporated into SUIII prior to the flood event described in AU2. The only artefacts from SUIV were bricks, which are likely associated with the drain construction, and may actually have been part of the drain. The artefacts most frequently recovered from SUV are similar in proportion to SUIII, with metal objects most frequent, followed by glass and bone. It is likely that some of these artefacts were incorporated in SUV during the construction of the drain, followed by disturbance and further incorporation of artefacts during the removal of flagstones and construction of the timber floor. A substantial proportion of bricks were also recovered from SUV, but as for SUIV these are likely directly part of the drain. No artefacts were recovered from SUVII as this layer is solid bedrock.

**Processes**

AU3 includes the construction of the original building elements which were revealed during the excavation and include SUIII, SUIV, SUV and SUVII. The construction can be seen as a discrete event occurring in 1829 with the excavation of the bedrock, construction of the brick-lined drains with surrounding phyllite fill, topped by a bedding loam, mortar and flagstone floor. A second discrete event occurred with the construction of the timber floor after 1861 which involved the removal and use of the flagstones as bearers for the new floor.

A cultural formation process is clearly identified in AU3 with the construction of the drainage system, surrounding fill, and flagstone floor set in mortar. Although obviously a cultural formation process, the type of formation process according to those described by Schiffer is difficult to clearly identify. The construction process fits to some extent in both the S-A (systemic to archaeological) process of cultural deposition, and the S-S process (systemic to systemic) of reuse, but not clearly in a single type. The S-A process of cultural deposition applies to the construction process in that the drain and other features were revealed from the archaeological context after originally belonging to the systemic context. The specific cultural deposition process of abandonment most closely fits where the construction features have entered the archaeological context. However, the drain and flooring still form part of the Commissariat Store building which remains in use, and remains in the systemic context. The S-S process of reuse applies to some extent here where materials remain within the systemic context but simply change from state to state or use to use. The reuse process of lateral cycling occurs where artefacts are transferred between different users but where there is no change in the use of the object. This does not completely fit the process at work in the Commissariat Store as the original flagstones from
the floor were used to support bearers in the construction of the later timber floor. The reuse process of secondary use may apply in this instance, being where material takes on a new use without the need to be extensively modified. The process of faunalturbation in AU3 is indicated by the presence of rats’ nests in SUIII and SUV.

AU4 – Aquaturbation

Stratigraphy
AU4 consists of SUVI which is the sediment located within and confined to the drainage system. Given the function of the drain to remove water from the area of the Store, the two distinct layers of sediment – SUVIa and SUVIb – are likely to have been deposited by the action of water. Evidence of the alignment of the original flagstones of the floor indicates their design for the enhancement of water flow into the drains in line with both the north and south transverse drains, extending to the eastern and western walls. The red oxide layer of SUVIb occurs in the bottom of the drain system and is the result of the action of water on metal artefacts in the sediment. The dark soil with grey clay and silt inclusions (SUVIa) which overlies SUVIb is likely to have entered the drain through the movement of water into the drain.

Not only is water likely to have deposited the sediments and artefacts in the drain, but mixed the sediments and artefacts once deposited. Water is likely to have entered the drain through both cultural and non-cultural processes including:

- washing the floors of the Commissariat Store;
- major and minor flooding of the Brisbane River, including entry of water from above and from backup of the drain from the river;
- rain; and
- rising damp and seepage from groundwater.

Due to limitations in the data recorded for the excavation of SUVI, it is difficult to further elaborate on the ongoing process of deposition of sediment in the drain.

Artefacts
The most frequent artefacts recovered in AU4 were animal bone, followed by glass, metal and ceramic. The artefacts recovered from AU4 show a different pattern of proportion than those recovered in AU1 and AU2. There was more bone, ceramic, shell and charcoal recovered in AU4, with less glass, metal and plastic than AU1. The location of the artefacts
in AU4 is likely caused through the actions of water washing into and through the drainage system under the Commissariat Store. The vertical position of artefacts in the drain sediments was not consistently or comprehensively recorded during the archaeological excavation, making it difficult to make detailed explanations about the various aquaturbation processes at work.

A metal button inscribed with “R.A. & J. KINGSFORD, BRISBANE”, manufactured by these Brisbane drapers between 1859 and 1873, was recovered in AU4. It is likely that the button was either deposited at the site during or sometime shortly after that time when these buttons were possibly housed at the Store. Based on the arguments for a second similar button recovered in AU2 (see AU2 above), it is possible the button was deposited at the site some time before 1893 and washed into the drain with the floodwaters of the 1893 flood.

A comparison of the proportion of plastic and shell buttons recovered in AU4 and AU1 reveals less plastic buttons and more shell buttons recovered from the drain sediments. Given the early use of shell for the manufacture of buttons, and the majority of plastic buttons being made after 1940, these proportions may reflect the shorter timeframe for plastic buttons to be incorporated into AU4.

A high proportion of the pieces of clay smoking pipes was recovered from AU4. As explained in AU2 regarding the timing of use of such clay pipes, it is likely the pieces entered the archaeological record prior to the 1893 flood and have been incorporated into the drain sediments either during or after that flooding event. Six coins were recovered from AU4 – three of unknown date, two from 1943 and one from 1926. These dates act as TPQs for the deposition of the coins, indicating the continuous process of material entering the drainage system.

Nine of the 12 fragments of pin fire cartridges from Westley Richards and Co carbines were recovered from AU4. These weapons, and presumably the ammunition, were only available in the settlement from 1867 to 1870 (Robinson 1997). In conjunction with the evidence of the cartridges in AU2, it is likely these cartridges entered the archaeological record prior to the 1893 flood, and possibly were incorporated into the drain deposits during the flood event.
A higher concentration of artefacts was recovered from the drainage system at the intersection of both the north and south transverse drain with the main drain. Clay pipe pieces, buttons, weapon-related artefacts and animal bones all showed a concentration at both the north and south intersections of the transverse drains. This may be an indication of the early entry point of water carrying artefacts and sediments via the transverse drains due to the alignment of the flagstones with these drains. When water entering the transverse drains meets water travelling through the main drain, the velocity may slow and turbulence increase as water flowing from different directions meets. The slower velocity of water would likely see the deposition of heavier particles such as artefacts.

**Processes**

The non-cultural formation process of aquaturbation is identifiable in AU4. The action of water on the sediments and artefacts has occurred at the site level, particularly in relation to the movement of water into and through the system of drains under the floor of the Commissariat Store. Aquaturbation appears to have been a continuous process throughout the history of the site. Although usually seen as a non-cultural agent, the water flow at the Commissariat Store has been culturally influenced with the drains and other constructions affecting the direction and pattern of water flow. Water may be introduced into the site as part of either non-cultural processes, such as flooding, or through cultural processes such as cleaning. Schiffer and other authors discuss water solely as a non-cultural formation process, however the cultural influence of water control and use must be considered.

**Summary**

Based upon the site formation processes identified, the following explanation of the formation of the site at the Commissariat Store is given. On construction of the Commissariat Store building in 1829 the existing soil and sediments from the entire site were removed to the bedrock. The bedrock was excavated for the foundations of the building and the drainage system to be constructed in the centre of the ground floor of the building. The phyllite bedrock excavated for the drain was fragmented and used as fill around the drains. The drain was constructed with a main bore and two transverse drains towards the northern and southern walls of the building. The drains were constructed using bricks, mortar and porphyry stone blocks and then capped with sandstone blocks. The phyllite fill was also placed over the top of the capped drains. A loamy bedding layer was laid over the phyllite fill over some parts of the drain. Mortar was then laid over the bedding layer and phyllite
fill, and porphyry flagstones were set in the mortar to form the original floor of the
Commissariat Store.

On its completion in 1829, the Commissariat Store was used continuously for a variety of
purposes including the storage of a wide range of goods and equipment, for office
accommodation, for the accommodation of newly arrived immigrants, and as living quarters
for the police constabulary. The use of the Store saw the inclusion of items into the
archaeological record through discard and loss and the accumulation of sediments on the
flagstone floor. After 1861, the flagstone flooring of the Store was removed, and a timber
floor constructed. The flagstones were removed from the mortar and used to support the
bearers of the new timber floor. During this construction the sediments and the artefacts
already accumulated were disturbed and incorporated into the mortar layer and phyllite fill.
After the installation of the timber floor, more items and sediments were discarded and swept
through the floor to accumulate below the floorboards forming a layer over the old mortar.

In 1893, a major flood of the Brisbane River occurred with the waters peaking at over three
metres above the floorboards of the Commissariat Store. The water entered the building
through the southern double doors and up through the drain, incorporating the accumulated
layer into the silt from the floodwater, and covering some of the accumulated layer with silt.
The floodwater exited the building through the doors and the drains leaving a layer of silt
below the floorboards, and washing silt and items into the drains. The silt left behind on the
floorboards would have been removed through washing with the water flowing beneath the
floorboards and into the drains, washing more silt and more items into the drain.

Throughout the existence of the Commissariat Store, rats were a problem, being attracted by
various foodstuffs and straw packing material in the Store. Rats built nests throughout the
site, disturbing the various layers of sediments and items under the floorboards. The rats
also brought animal bones into the site for food. Tree roots entered the building near the
western wall, disturbing the sediments in that area. The continuing use of the Commissariat
Store for storage and office accommodation, saw the continued formation of a layer under
the floorboards consisting of dust, sediment, straw and various objects which were discarded
or lost through the floorboards. Major renovation of the building in 1978/79 involved an
archaeological excavation which revealed the sediments, artefacts and features of the
Commissariat Store.
CHAPTER 6 – CONCLUSION

The study of archaeological site formation processes is commonly undertaken in prehistoric sites, but only in a limited way in historical archaeological sites. Identifying and explaining site formation processes is an important first step towards developing justifiable inferences about past behaviour and past societies. A sound understanding of the archaeological record and how it was formed is necessary in order to effectively interpret the data that is recovered. This thesis addresses the question of what cultural and non-cultural processes formed the archaeological record at the historical site of the Commissariat Store in Brisbane.

An analysis of the known history of the site from its construction in 1829 identified a number of impacts and processes expected to be revealed in the archaeological evidence including:

- the influence of water control measures on sediment deposition;
- the presence of artefacts such as animal bone, buttons, ceramic, glass, and nails;
- the activity of rats;
- the presence of domestic items including ceramics, clay smoking pipes, bottle glass and coins, including items of British, German or Chinese manufacture;
- the presence of items related to policing such as uniform buttons and ammunition;
- disturbance of deposits through construction activities;
- the appearance of silt from flooding; and
- the presence of office-related items such as stationery.

The archaeological investigation of the site undertaken in 1978/79 revealed seven stratigraphic units, 38,035 artefacts and a number of features including flagstones and an underfloor, brick-lined drainage system.

Of the expected processes and archaeological implications identified from the known history of the site, the following were revealed in the archaeological evidence:

- The presence of items including metal, glass, ceramic, buttons, clay pipes, and weapon-related artefacts related to the various uses of the Store including storage, immigrant and police accommodation, and offices;
- The presence of rats in the site including intrusive material and rats’ nests;
- Silt from the 1893 flooding of the Brisbane River; and
- The occupation of the building by police from the presence of police buttons.
Some of the processes expected to be revealed in the archaeological record were difficult to identify, or were not revealed during the analysis, including:

- The detailed pattern of movement of sediment and artefacts into and within the drainage system, which was difficult to identify due to the broad nature of the data recorded during the excavation of the drain sediments;
- The pattern of change of items through time, such as the relative increase in stationery items during the use as office accommodation, or the change in size of artefacts incorporated in the archaeological record following installation of floor boards; and
- The direct relationship of the evidence to the occupation of the Store by immigrants.

Although the first of these issues is unable to be resolved due to the destruction of the archaeological record, the second and third issues may be addressed through additional research including detailed artefact analysis.

The site formation processes identified from the historical and archaeological evidence for the Commissariat Store site include the cultural formation processes of discard, loss and possibly abandonment and reuse. Evidence of the non-cultural formation processes of faunalturbation, floralturbation, flooding and aquaturbation were also found at the site.

Other findings of this thesis relate to the deficiencies identified in the types of cultural and non-cultural formation processes described by Schiffer as a model for identifying such processes. The cultural formation process of the construction of the drainage system, surrounding fill and flagstone floor does not clearly fit in a single category. The S-A process of cultural deposition, particularly abandonment, applies to some extent to the construction being recovered from the archaeological record. However, as the construction still forms part of a structure which remains in use, the S-S process of reuse is also applicable. This situation is not likely to be unique in historical archaeological sites, and needs to be more clearly addressed within the literature on the identification of site formation processes. The second deficiency relates to the formation agent of water. In the literature, water is discussed solely as a non-cultural formation process, however as identified in this thesis, water at the Commissariat Store has been culturally influenced by the drainage system at the site, and this has impacted on the archaeological record. Additionally, water is not solely introduced into a site through non-cultural processes. Water may be introduced through cultural processes
such as maintenance and cleaning. The cultural process of water control needs to be considered more carefully in the literature.

This study has revealed information that would not have been discovered without identifying the processes which formed the site. This information will impact upon the future interpretation and research at the site and includes:

- The pattern of flooding and movement of water, sediment and artefacts, as indicated by the previously unknown atypical stratigraphy which was revealed in the southwest corner of the site;
- The clear presence of rats and their impact on sediment and artefact disturbance and the movement of bone into the site;
- The construction of the original floor and its subsequent disturbance through its removal and replacement with the timber floor;
- The processes of discard, loss and maintenance in the formation of the sediments and presence of artefacts in the archaeological record; and
- The historical, artefactual, and stratigraphic evidence both before and after the flood event which clearly indicate the dating of the flood to 1893.

This thesis clearly demonstrates the value and importance of understanding site formation processes as a firm basis for future interpretation of the archaeology of the Commissariat Store site. This study has provided more confidence in the integrity of the archaeology of the site, the types of processes at work in the formation of the site and their influence on the distribution of the artefacts in the site. It provides a thorough foundation for additional future research and more specific questions to be asked about the site including questions about the people who lived and worked there and the nature of the settlement and development of the city of Brisbane.
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