

*THE ECONOMIC IMPACT OF CONVICT  
TRANSPORTATION ON THE WESTERN  
AUSTRALIAN ECONOMY 1850-1900: AN  
ARCHAEOLOGICAL INVESTIGATION*



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**This dissertation is submitted in partial fulfilment of the requirements of  
the Masters of Professional Archaeology**

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## DECLARATION

I declare that this thesis is my own account of my research, written in the full knowledge of what constitutes plagiarism and documented accordingly, and contains as its main content work which has not previously been submitted for a degree at any university. I consent to the publication of this document on the internet via a UWA site..

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## ABSTRACT

The introduction of the convict system in 1850 into the Western Australian (WA) economy resulted in a large injection of capital into the colony, the dissemination of which cannot be overlooked when considering the transformative effect of the convict system on the WA economy. This injection resulted from the purchase of goods and services by the penal system which ultimately transferred money from the British Crown into the local market; the breakdown of which would have necessarily resulted in certain industries receiving larger benefit than others. This thesis will act as a pilot study to consider the potential of using archaeological evidence in conjunction with economic models in order to consider the transformation caused by this capital expenditure. Using a two scaled approach and focusing on the time period between 1850 and 1900, a combination of historical and archaeological data is used to develop an understanding of the breakdown of spending by the penal system. Fremantle Prison will act as the base of the archaeological analysis, testing the variation in commodities seen between collections relating to administrative purchases of the system as well as the purchases made by a high level wage earner and their family. By considering whether purchases represented local commodities or imports it is possible to see how the capital transferred to the local economy and how much of that spending leaked out of the economy through imports. In doing this, it highlights the range of methods through which penal system capital entered the colony, and how the agency available to specific aspects of the system altered how the capital was used and ultimately its impact on the colony.

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# 1. INTRODUCTION

“Convict transportation to WA was a tremendous success for those who employed convicts or were able to access some of the £1.8million in British treasury spent in the colony between 1850 - 1860”

(Millett 2009, p. 241)

According to Keynesian economic theory, consumption directs how an economy develops as producers adapt to local demands in search of profit. The introduction of the convict system in 1850 to the Western Australian (WA) economy resulted in a large injection of capital into the colony, the dissemination of which cannot be overlooked when considering the transformative effect of the convict system on the WA economy. This study aims to use archaeological and historical evidence to examine the impact of the convict system on the WA economy in the second half of the 19<sup>th</sup> century, by focusing on the goods and services purchased by the penal system. Unlike other archaeological studies of convictism that concentrate on the lives of convicts, this study examines the economic impact of the penal system itself on the colony.

The penal system provided economic benefit to the WA economy through the injection of capital and labour and tied the colony into wider global penal and trade networks ( Winter 2013c). This study will consider how the changing administrative role of the penal system between the convict and post-convict period impacted the avenues through which funds were injected into the local economy and, subsequently, the changing role of the penal system as an economic force from 1850-1900.

As a pilot study, this thesis will use a historical archaeological approach to assess the potential of using archaeology as a method of determining the nature of that benefit and its linkage with existing networks. To achieve this it will focus on the goods consumed as part of the penal system and the linkage of these goods to increased demand for specific local industries. Using the concept of 'linkages' developed in the economic-based Staple Theory (Altman 2003;McCarty 1964) the injection of funds into the WA economy will be analysed as a 'quasi-export', given that the convict system was supported by British funds. Material culture will be used as evidence of the transfer of British capital in exchange for goods and services purchased by the penal system in the form of institutional- or wage-based expenditure. By considering whether the penal purchases represent spending on imported goods or local produce it is possible to estimate the value of this capital injection to the domestic economy. It is also of interest to examine how that spending changed along with the development of the convict system and the subsequent transition to colonial control.

This study will focus on two scales of approach in its analysis: macro and micro. Historical data will be used to develop an understanding of the overall (macro) allocation of funding and demand of goods by the penal system as represented in advertised tenders and financial reports found within the British Parliamentary papers and Convict Finance Board records. This part of the analysis will highlight the various outlets for British funds in a broad manner to consider the

variation within the penal system and wide reaching impact of the capital injection

Archaeological material will be used to test the value of considering individual aspects (micro) of the penal system when considering how the consumption choices of the penal system impacted the local economy. The two sites analysed represent two aspects of the penal system between 1850 and 1900: material collected from a privy within the home of a high ranking administrator within Fremantle Prison and their family; and the consumption of the inmates collected from a rubbish pit found within the grounds of the prison. These assemblages highlight the difference between institutionalised and wage-based purchases and the variation that occurs within the penal system based on circumstance as well as the temporal period under consideration.

Historical archaeology has long considered economic factors in its analysis of past societies, often seeing capitalism and colonialism as driving factors behind the increasingly globalised nature of the world post 1500a.d. (Orser 1994a). Prior analysis of consumption as a measure of global interconnectedness has been seen in previous studies such as Nayton (2012) in her study of colonial North West Western Australia and its links to British trading networks, as well as Groover(2003) in his study the Gibb's family homestead. Both highlight the evidence of global trade networks despite the apparent isolation of their study areas. The analysis of the Western Australian penal system in relation to its spending has been considered by authors such as Gibbs(2001, 2006) and Edgar(2014) who have highlighted the value of the penal system as not only a source of labour but as a force that developed the economic and social situation of the colony through the variety of economic, political, and social changes that occurred. This research follows on from these ideas in focusing on the specific avenues through which capital entered the economy and which industries benefitted from the injection.

While the Swan River colony was initially established to be free from convicts, it struggled from a lack of labour and capital. In 1849, at the request of the colony,

it was converted to penal status, under which the British Crown would be responsible for convict maintenance (Statham 1981a). In doing so the penal system, organised around Fremantle Prison, was used as a mechanism to inject convict labour and imperial funds into an otherwise highly impoverished colony.

Until the gold rushes of the 1890s, the penal system was the major transformative event that occurred in Western Australia. During this post-convict period the penal system was converted from a mechanism sustained by the British government which interacted with, and subsequently stimulated, the WA economy; into an isolated system in whose centre, Fremantle Prison, attempted to be self-sufficient with minimal funding from the local government. This conversion resulted in a significant change in spatial layout of the system as well as a complete shift in the source of funding for Fremantle Prison. The difference in funding sources would have accompanied varied goals and priorities for the maintenance and use of prisoners resulted in a changing economic impact. In order to consider the impact of the convict system on the WA economy during the convict and post-convict periods I will consider the following research questions:

1. What does the material and documentary record tell us about the impact of the penal system on the WA colonial economy between 1850 and 1900?
2. At what point in the production cycle were materials sourced from the WA Economy? How does this vary in the convict and post-convict period?
3. How did the material demanded by the penal system vary between institutional and private (wage-based) consumption?

Given the preliminary nature of this study, an additional research question relating to methodological potential was posed:

4. Can individual artefact assemblages be linked to specific aspects of the colonial economy? If so, how closely?

This pilot study aims to test the potential of using archaeological evidence in conjunction with established economic models to understand the impact of consumption choices on the development of an economy. It is primarily intended to test the feasibility of using archaeological material and historic data to trace consumption to production processes, either locally or internationally, and uses this analysis to measure economic impact. The penal system represents an extremely varied economic entity, with varying levels of interaction with the WA economy based on institutional circumstances and the agency of individual consumers. By comparing the consumption choices and subsequent impact on suppliers of two distinct aspects of penal system, it is hoped that the variance in economic impact of these specific aspects can be acknowledged; highlighting the value of considering the penal system using varied scales of analysis. Additionally, by highlighting the changing consumption choices of the penal system over time, represented in these artefacts, this research will attempt to highlight the variance seen not only through distinct entities of the system, but also in commodities occurring over time within a site. The use of this methodology within these two sites is intended to provide an example, which highlights the potential of considering the penal system using economics as a theoretical background that subsequently can be applied to further sites within the penal system to develop a more comprehensive analysis.

This dissertation will consist of 7 chapters and begins in chapter 2 with an historical overview of the time period under analysis with a focus on the economic activity of the Swan River Colony. As part of this chapter the introduction of the convicts and subsequent transition from the penal system to colonial rule is considered in relation to its economic impact on the colony rather than its use as a system of punishment. Chapter 3 consists of both a Literature review and a theoretical background which highlights previous archaeological



approaches to convictism as well as highlighting how economics has been applied to archaeology. The economic theory used as a basis for this analysis is also introduced. Chapter 4 highlights the methodology used within this analysis, illustrating the varying roles of the documentary and archaeological sources and how the artefact and historical evidence will be used to illustrate the impact of the penal system on the colonial economy. Evidence collected from both sources will be presented and analysed in chapter 5, separating the results into 'macro' documentary-based and 'micro' artefact-based evidence. Chapter 6 will synthesise the information provided and discuss the implications of the results in relation to the research questions. Finally, Chapter 7 will evaluate the outcomes of this study in relation to global research as well as comment on the limitations of this analysis and potential for future research.

## 2. HISTORICAL BACKGROUND

While the Swan River colony was initially established to be free from convicts, it struggled from a lack of labour and capital, and at the request of the colony, the decision was made in 1849 to convert it to penal status in which the British Crown would have responsibility for the maintenance of the convict population (Statham 1981a). In doing so the penal system, organised around Fremantle Prison, was used as a mechanism to inject convict labour and imperial funds into an otherwise highly impoverished colony and subsequently spur on development.

“The mechanics of which the economist Keynes might have approved were there – both the pump priming expenditure and the demand creation – but it was also the psychological trigger needed to snap the colony from its vicious cycle of despondency”

(Lourens 1979, p.22)

Between the initial colonisation of WA in 1829 and the gold rushes of the 1890s, the penal system was the major transformative event that occurred in Western Australia. It can be broken into two phases: the convict system from 1850-1886; and the post-convict system which occurred after the remnants of the system, which had rapidly declined after the cessation of transportation in 1868, were

handed over to the colonial government during a protracted post-convict period from 1886-1900.

## 2.1 Pre-Convict Economic Situation

The Swan River Colony was initially founded and settled in 1829 as the first British colony in Australia established to be an entirely free settlement (Statham 1981c). The conditions of settlement were designed to minimise British government expenditure, attract private investors and ensure that land granted was productively utilised. Initial land grants provided 40 acres of land for every £3 invested in physical assets considered applicable for land use or for the assisted passage of indentured labour and their families (Bush 2012, p.45). Money itself was not considered an asset that would aid in the improvement of the land and as such did not qualify colonists for land under the system. Given this, there was little benefit in transporting cash stocks to the colony (Appleyard 1981; Burke 2004, p.359; Dept. of Treasury and Finance 2004).

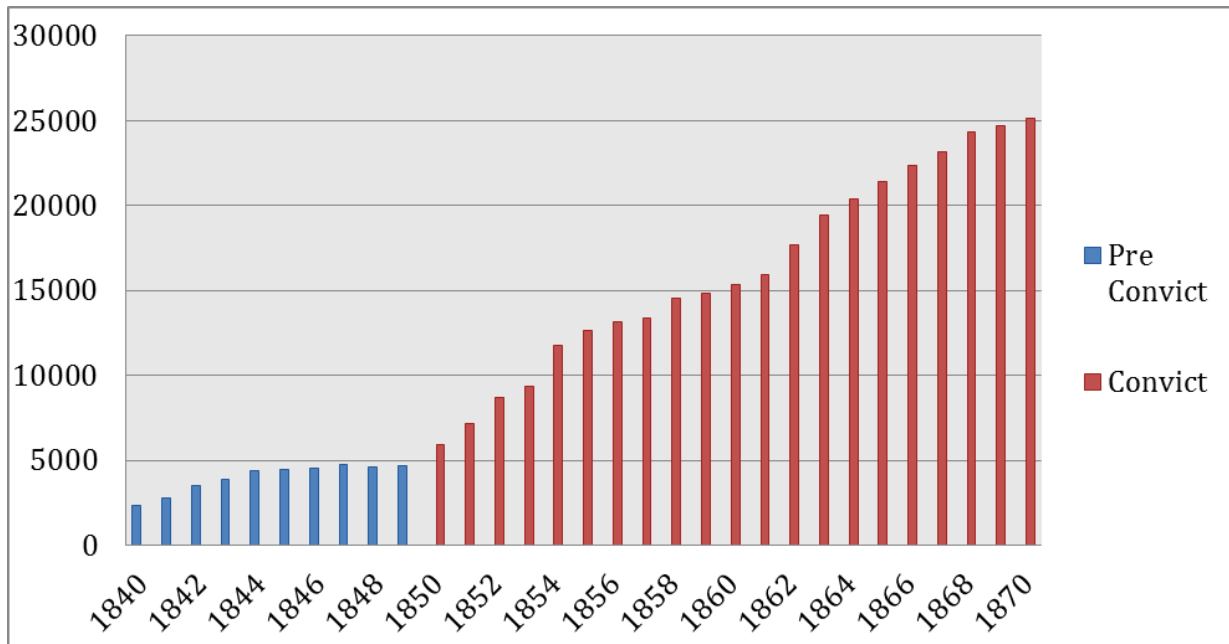
By 1830 reports of inhospitable conditions had reached London and, combined with the cessation of the land grant program in 1832, emigration had stagnated (Bush 2012, p.48), removing the benefit of an increasing population to the local market. In addition, shipping and access to the wider global trade network was significantly restricted by both population size of the colony and by the Navigation Acts which limited potential trade opportunities to those available from British or Colonial ships (Broeze 1975, p. 583). By the mid 1830's only a few vessels arrived from overseas ports each year, and even after the Navigation Acts were repealed trade was dominated by imports from Britain (Staniforth 2003, p. 126). The combination of decreased population growth and lack of shipping limited the economic growth of the Swan River colony to an extent where the colony was still heavily dependent on crown support 20 years after colonisation (Staniforth 2003, p.126).

These conditions caused many settlers to attempt to support themselves on a small range of settlement activities, namely intensive agriculture (Statham 1996, p.42). As such the colony was heavily homogenised and lacked the diversification of goods and services and the size necessary to form an effective market. Additionally, the lack of land-based transport limited the movement of goods to maritime transport or dray cart, both of which were not only expensive but also limited the distance goods could travel before it became unviable to sell at a profit (Cameron 1981; Nayton 2012, p. 32). Physical assets brought with the colonists were largely mismatched with local conditions with many early crops failing, forcing the government to use their small amounts of available capital to purchase supplies from Van Diemen's Land (Bush 2012, p.46) and Java (Statham 1996, p.42). Without cash available in the economy these supplies were distributed based on an exchange for future crops system (Statham 1981c, p.188), trapping settlers into continued (inefficient) grain production to pay off their debts.

Early settlers were largely urban-based in background and skill level (Cameron 1981; Statham 1981c, p.185): however some were able to adapt quickly to their surroundings, in many cases altering the local environment and adapting available technology to better suit the local conditions (Burke 2004, p.365). The first colonial industries were those related to local building material, though the capital shortage meant that much of the trade in these goods was carried out by barter (Hartley 1995).

While sheep had become the first viable export industry in the late 1830's, the colony's isolation and limited trade networks continued to restrict access to the international market. Locally the small and highly homogenised market lacked the necessary population to diversify or drive increased production. The introduction of the convict population was considered as an avenue that would provide a cheap and subservient labour force and provide the colonial government the labour and capital required to undertake substantial capital works. However, this was not the overall opinion of the majority of the colonial

workforce, many of which saw no benefit in the introduction of the convict population but rather the concentrated effort of an influential few (Statham 1981a, p. 8).



**Figure 2-1: Western Australian Population Figures illustrating the increasing Population in the Convict Period (Australian Bureau of Statistics 2014)**

Between 1845 and 1847 influential citizens of the colony represented by the York Agricultural Society and several merchants lobbied the colony’s Legislative Council to petition the British Government to consider converting the colony to penal status. These pastoralists were the main agitators for convict labour reacting to the high cost of labour in the pastoral industry and the defiance of the working class that had resulted from the ability to bargain for better wages and conditions (Nayton 2012, p.18). The York Society argued that the shortage of labour was hindering the development of the colony, particularly the development of infant industries producing wool and timber (Campbell 2011, p.1.3). In addition, it was argued that the convicts could be used for the construction of public works which had previously been a slow and expensive process.

The Swan River Colony’s request for convicts was received at a time in which the other Australian Colonies were refusing further transportation (Shaw 1966,

p.325). Simultaneously British penal ideology and legislation had begun to focus on reformatory penal theory and a move towards Incarceration in lieu of Transportation. Despite this, Transportation was still considered strategically beneficial under specific circumstances (Winter 2013b, p.4) and as such, the crown endorsed the proposal to convert the Swan River Settlement into a penal colony. The Colony requested that any convicts sent had enough time left on their sentence to be used for public works; and that financial maintenance of the system be the responsibility of the Crown (Thomas & Stewart 1978, p.32). This is emphasised in a dispatch sent from Governor Fitzgerald to the Colonial office on the 3<sup>rd</sup> March 1849:

“A supply of labour alone is insufficient to meet the wants of the colony while the existing scarcity of capital exists.” (Fitzgerald 1849, cited in Statham 1981b, p.16)

Eventually it was settled that the maintenance of the convict population would be the sole responsibility of the Crown: including the payment of wages for guards, administrators and the assisted migration of settlers to offset the gender imbalance provided by an all-male convict system (Hartley 1995, p.13). Additionally the Imperial Government would provide 2/3rds of the funding for the police force which, until the introduction of the convict force, had been small and uncoordinated (Edgar 2014, p.144). In doing so they would provide the capital that the colony desperately required through the purchase of goods and services used in all aspects the convict system and the spending of those it employed.

In December 1849, Earl Grey informed the Governor that the Swan River Colony would receive a ‘moderate number’ of convicts, carefully selected, who had passed the reformation phase of their sentence (Campbell 2011, p1.3). These men would be initially under the control of the colonial government for public works before earning their ticket of leave and being released to find gainful employment within the private sector.

By 1850 the Swan River Colony's level of economic activity was still significantly lower than the other Australian Colonies. Comparatively, it had taken them more than 20 years to develop to the same point that the Port Phillip Colony in Victoria had achieved in 5 years (Staniforth 2003, p. 126) or that Port Jackson in New South Wales had achieved in 10. While primary exports in the form of wool, timber, sandalwood, whale products, and livestock were beginning to be exported in small numbers the WA Colony maintained a negative balance of trade and was still heavily dependent on Crown support (Statham 1981c, p. 181). The combination of reliance on imports, small population, lack of capital, and infrequent and expensive shipping provided significant barriers that depressed development within the colony.

Year	Total Exports (£)	Total Imports (£)	Ratio EXP/IMP
1844	13363	36440	0.37
1845	13354	20350	0.38
1846	20223	25959	0.78
1847	24535	25463	0.96
1848	34324	45411	0.76
1849	31558	53881	0.56
1850	29857	52351	0.57

**Table 2-1: Total Yearly Export and import Figures for the Swan River Colony Highlighting the Disparity Between Capital Entering and Leaving the Colony, Reproduced from Hartley (1995, p.10)**

The convict system provided an instantaneous boost to the domestic market for consumables, with the population increasing from 4,622 in 1848 to 29,708 in 1881 (Caldwell 1987; Van Driesen 1986). This includes the transportation of just under 10,000 male convicts (Millett 2003, p.11) and over 5,000 assisted migrants (Hartley 1995, p.13). From 1851-1860 the convict system spent £906,000 in wages, salaries, and foodstuffs (Statham 1985), much of which cycled through the local economy via the purchase of local goods and services,

either administratively or through wage spending. Some authors have suggested that the colonists had found a ready market for all the food they could produce with the introduction of the convict establishment (Somerville n.d, p.282): in reality, the convict establishment sourced its goods based on a market tender process with some of their supplies coming from external sources such as the South Australian colony. This caused tension within the colony with some colonists believing they had accepted the 'taint' of convictism without receiving the full benefit (Thomas & Stewart 1978, p. 37).

## 2.2 Convict System

The priorities of the Western Australian convict system were the development of a cheap, regionally dispersed labour force and capital and infrastructure to improve the Colony's fortune (Gibbs 2007, p. 58; 2006). The convict system was organised with Fremantle Prison at the core and the regional hiring depot system representing the periphery, which emphasised reform and punishment at its centre and settler access to labour in the outlying areas (Winter 2013a, p.62). The development of the regional convict depots responded to the difficulties of organising ticket of leave labour in the wide spread colony. For the convict system, work formed an integral part of the reform and punishment process for convicts as well as a mechanism to provide labour to the wider population (Bavin 1994).

Prisoners inside Fremantle Prison were classified in multiple ways, primarily relating to whether or not they were a Colonial (local) prisoner under the rules and regulations created by the WA Legislative Council, or an Imperial (transported) prisoner with treatment based on the laws of British Parliament (Millett 2003, p 209). This affected which government paid for prisoner maintenance and their treatment upon release from prison. Imperial convicts received a set of clothes and accrued funds earned from work while in prison



and a Ticket of Leave upon release; in contrast, Colonial prisoners were largely abandoned (Millett 2003, p. 209).

Daily life for the inmates of the convict period was defined by hard labour based around the dominant penal ideology of the time which focused on rehabilitation through work and religious instruction (Foucault 1975). Convicts were officially provided with a calorie-heavy diet proportional to the level of work assigned, however, reduction of rations was one of wide array of punishments used in order to maintain discipline (Millett 2003) Additional variation in the everyday life of inmates developed through unofficial networks including the trafficking of contraband between warders and prisoners, the sourcing of contraband during work assignments (Bosworth 2004, p.33), and the bribing of inmates by merchants to 'pass' substandard produce (Thomas & Stewart 1978, p. 56). Workshops formed an integral part of training and reformation at Fremantle Prison, influenced by Protestant Ideology that 'honest labour' had a reformatory effect on the criminal mind- and the desire to minimise the running costs of the system. The workshops were the first buildings erected on the site of the permanent prison, beginning with carpentry and blacksmithing and later developing into printing, tailoring, and shoe making (Kerr 1992, p.56.)

Once newly arrived convicts had been indoctrinated into the penal system at the Fremantle Convict Establishment they would be eligible to work under supervision outside the prison walls. After an allotted time, and dependent on good behaviour, a convict would be assigned a Ticket of Leave allocating him to a work district granting him eligibility to be hired by settlers through the regional hiring depot system (Gibbs 2006, p.72). The utilisation of convict labour by private settlers was vital to the success of convicts in Western Australia with settler access prioritised over security at the convict depots (Gibbs 2007; Winter 2013a, p. 339). The Ticket of Leave system allowed the convicts the power to negotiate wages and conditions with employers while allowing the system to maintain some level of control of the movements of the labour force (Appleyard 1981; Winter 2013a).

The Ticket-of-Leave men provided dual benefit to the economy acting as both producers and consumers in the rural areas they were assigned. The Ticket of Leave system provided men with some rudimentary skills in building and trades which allowed them to quickly gain employment within the private sector (Bush 2013, p. 320). As agents with economic freedom their wages could in turn be used to purchase consumables and articles to supplement items officially supplied as part of the convict system, such as alcohol, food condiments, and medicines (Winter 2013a, 318-319). This helped to stimulate the local economy by increasing the market demand for goods and services.

Over time the number of convicts transported to WA steadily dropped until in 1886, with less than 50 convicts still interned at Fremantle Prison, it was officially handed over to the Colonial authorities where it continued to be used as the state's major prison until 1991 (Gibbs 2001; Mein 2012, p.20). While the prison remained operational, the rest of the convict system and the wider benefits provided through the convict labour force and assisted emigration were wound down over time. The convict depots and road stations, which had been undergoing a process of downsizing in the 1860's, were abandoned in the early 1870's in favour of a consolidated system centralised at Fremantle Prison. At this point the majority of the convict work force had been assigned their Ticket of Leave and were already working in wider colony without the regional administrative base that had been provided by the convict depots. Additionally the support provided to the colony by assisted emigration also ceased in 1869 (Erickson 1992, p. 90). In doing so, the prison transitioned from the centre of a state-wide convict system with multiple avenues of economic benefit to its own closed system.

In general the convict system had a transformative effect on an otherwise slowly developing extremely isolated colony. Through the injection of a large additional population, additional capital expenditure and the focus on public

works the convict system was able to support the economy by providing the basic factors of productivity required for the local economy to grow.

## 2.3 Post-Convict System

During this post-convict period the penal system was converted from a mechanism which interacted and subsequently stimulated the WA economy through its state wide system of labour and punishment into an isolated system focused solely on imprisonment with Fremantle Prison at its centre. British capital investment into the penal system continued, though at significantly smaller levels than during the convict period as the Colonial Office continued to provide for Imperial convicts and the pensions of Imperial Officers who were not transferred into Colonial service (Stevenson 1983, p.26).

As the convict system was wound down the amount of work available for the prisoners diminished considerably given that prison labour was no longer accepted or needed by the community (Thomas and Stewart 1978, p.49). Additionally Superintendent George in 1898 as part of his first annual report recommended a more oppressive regime, stating that all work outside the prison should cease given the passing of contraband which was considered to stem from a convict's access to the outside of the prison (Thomas & Stewart 1978, p.49).

Within the Prison cellular confinement became a much larger aspect of imprisonment. With the gold rushes of the 1890's a once dwindling prison population boomed and as such small cell size became a much more prevalent issue with confinement changing to be much more heavily based around time in the cell (Mein 2012, p.17).

In 1899 the conditions were subject to a Royal Commission into the Western Australian penal system which noted a variety of issues with the existing prison facilities including lack of space for confinement and lack of proper employment

within the prison (Thomas & Stewart 1978, p.69). This Commission resulted in a number of developments in the fabric of the prison and treatment of prisoners which continued into the early 1900's.

The contraction of the convict system and eventual handover resulted in the penal system having a significantly reduced economic impact based primarily on the scale of operation that remained in the later period. While the Ticket-of-Leave men remained in the wider colony and continued to act as both producers and consumers of goods and services, the significantly reduced number of both interned prisoners and new Ticket-of-Leave men resulted in a significantly reduced level of capital expenditure and output by the penal system that continued until the prison population once again increased in association with the gold rush.

# 3. REVIEW OF LITERATURE AND THEORY

## 3.1 Literature Review

Convict transportation falls within the thematic sphere of a wider global migratory trend which drastically increased in scale from the 17<sup>th</sup> century. While convict transportation was a global process, archaeological investigation of the phenomenon has largely been conducted within the Australian context (Winter 2013a, p. 78). Western Australia represents the final Australian development of the Transportation phenomenon and is unique in its instigation after the initial development of the colony and subsequent existence as a specific portion of a wider colonial system. This literature review will begin with an overall analysis of research into Australian convictism before highlighting specific studies into the Western Australian convict system and Fremantle Prison. There has been minimal work undertaken considering either the penal system or the convicts as a source of economic demand in the literature. As such previous use of economic analysis throughout Australian convictism and colonial Western Australia will be considered to understand how economics has previously been used to inform analysis of historical and archaeological studies.

### 3.1.1 Convict Archaeology

Convict studies in archaeology have largely concentrated on convict systems in relation specifically to the convicts themselves. In contrast, this study is interested in the impact of the system on the colonial economy. Convict transportation was primarily motivated by British strategic interests, and while each colony received different benefits, both economic benefit and convict storage were always significant influences on Transportation. There is considerable difference in the introduction and historical perception of convicts between the Eastern states and WA and until recently the WA story has been largely ignored in convict studies (Millett 2003; Reece 2009; Winter 2013a).

There has been a significant amount of work completed in relation to convict archaeology in eastern states of Australia. Gojak (2001, p.73) and later Gibbs (2012) in their overviews of New South Wales' convict archaeology demarcated three main areas of previous research: the living conditions and experiences of the convicts (e.g, Godfrey & Cox 2008; Nicholas & Shergold 1988); penal institutions and punishment (e.g. Casella 1997, 2000, 2001; Dircks 2013; Davies and Buckley 1987; Hamilton 2013; Starr 2001); and the development of society based on convict exploitation (e.g. Karskens 1997, 2003).

Significant attention has been paid to the living conditions and experiences of the convicts. Often this has been initiated as a critical examination of the historically negative perception of the convicts as hardened criminals, the convict system as brutal, and convict labour as inefficient and providing little economic benefit to the colonies (Godfrey & Cox 2008; Nicholas & Shergold 1988; Somerville n.d). Statistical analysis has been used to consider the demographic breakdown of the convict system and often focuses on the age and stated occupation of the convicts (Butlin 1994; Robson 1994; Shaw 1966). Alternatively studies have focused on the living conditions experienced as part of the convict system and how often official living conditions were partially motivated by maintaining the convict's capacity to work and subsequent value

as an asset (Nicholas 1988b). Some studies of convictism have looked at coerced convict labour, focusing the value of the skilled and unskilled labour they provided to the economy (Tuffin 2013; Silliman 2006; Casella 2007, 2001; Maxwell-Stewart 1990; Meredith 1988). Convict labour has been considered in multiple worker scenarios ranging from work gangs on projects such as the Great North Road (Nicholas 1988a; Karskens 1986) to allocations in the private sector (Perkins 1988), as well as the Ticket of Leave system which was the primary labour allocation method used in Western Australia.

Karskens' (1997, 2003) analysis of the Rocks, Sydney has illustrated the role of commodities within the lives of convict households. Her analysis revealed a society that exhibited traits of both pre- and post-industrial societies in which the procurement of supplies was both related to the development of cottage agriculture and a reliance on shop based purchases. In her analysis the Rocks showcased a localised reaction to the global development of capitalism and mass consumption, a system in which the convicts both participated in and adapted to their own needs. Her analysis is supported by a historical study of Sydney consumer patterns completed by Elliot (1995). Using a variety of historical documentation including shipping logs, shopkeepers records, and account books, James was able to show that not only did the convict population demand a variety of commodities, many of which were conspicuous in nature, but also that the market, in particular importers, were catering specifically for the convict and middle classes in their business. These sources highlight the value of considering the convicts as more than a source of labour: rather as consumers who through their choices have impacted business choices and development.

### 3.1.2 Western Australian Convict Archaeology

Western Australian archaeological studies have looked at the convicts both for the economic value of the convict labour itself (Bush 2012; Gibbs 1997) and in relation to their lifeways and experience both within (Bavin 1994; Burke 1998; Nayton 1998) and outside of the institution of Fremantle Prison (Gibbs 2007, 2001; Winter 2013a).

Gibbs (2001, 2006) provides an outline of the extent and structure of the convict system in Western Australia, in which he separated convict places into three broad categories: first, those directly related to the operation of the system such as the places where the convicts lived and worked as seen in work such as Winter (2013a); second, those relating to housing and administration for those who assist in maintaining the system such as pensioner guards cottages (Burke 2007; Gibbs 1991); and third, the public works created by convict labour (Gibbs 2001, p. 61). Each of these aspects of the convict system provides a distinct economic benefit to the colony, and while many of these studies briefly mention economic function, they rarely emphasise the connection between consumption choices and economic impact.

Bush's (2012) study investigated the impact of Ticket-of-Leave men on the built environment of Western Australia. Prior to her study the impact and extent of the convict system in an archaeological sense had been limited to the areas that were able to be conclusively linked to the convict system such as the sites mentioned in Gibbs (2001). Her study focused on the impact of the convict system on the built environment in the private economy by examining changes to building practices and architecture between pre-convict and convict era buildings. She concluded the large Ticket-of-Leave workforce allowed for the construction of larger more durable modern structures. As the skills required for construction were imparted through training provided by the Royal Engineers



under the convict system, the introduction of the Ticket-of-Leave men as a workforce represented an injection of skilled labour into the economy, measurable through the built environment.

Winter's (2011, 2013a, 2013c) work focused on the analysis of regional convict depots to consider the varying impact of the ticket-of-leave system on aspects of a convicts life. He found in general that a regional convict had economic freedom which they primarily used to improve their diet and health. Additionally Winter (2013a) developed a model which highlighted the global transfer of goods, people and information that occurred as part of the penal system, a global connection which is relevant to both the penal system and wider global trade throughout the historic period.

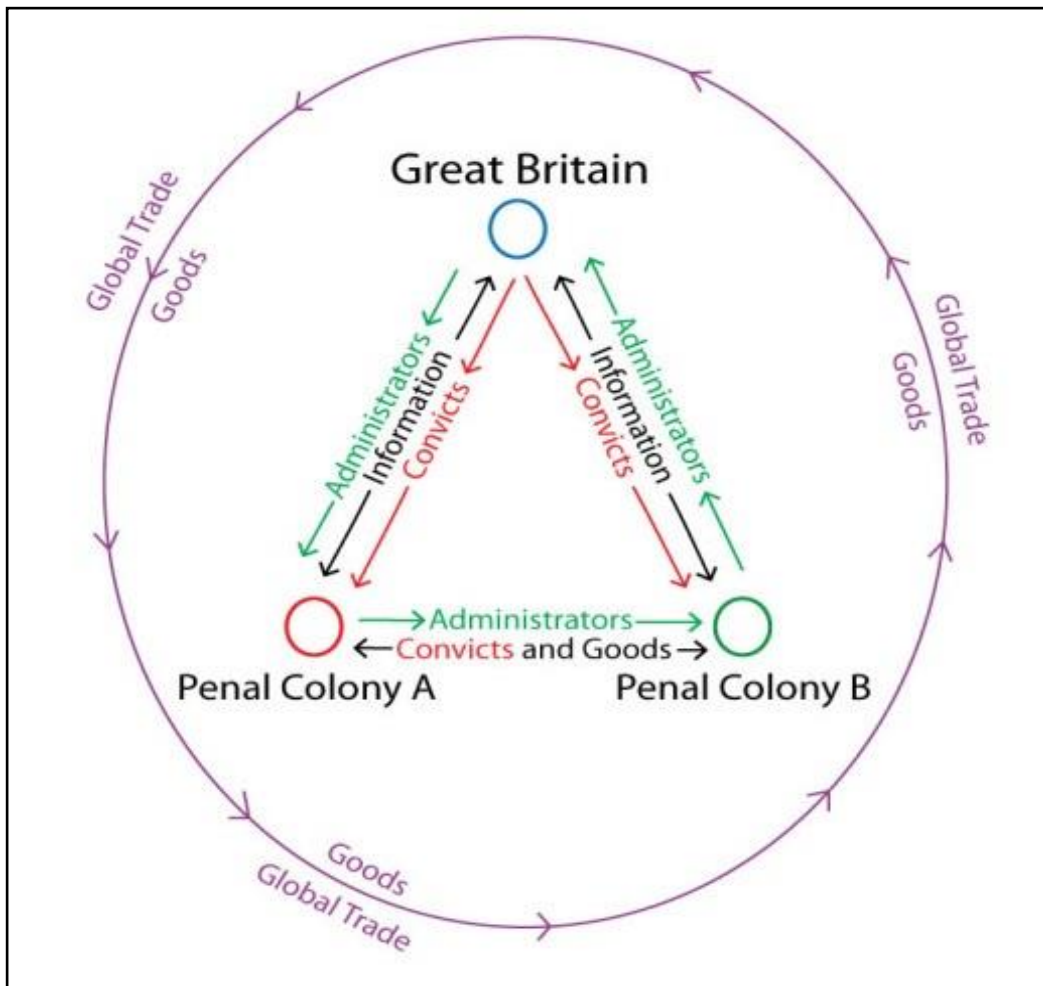


Figure 3-1: Model of the Movement of People, information and Goods within the Penal System, Reproduced from Winter (2013a, p.31)

### 3.1.3 Fremantle Prison and the Archaeology of Institutions

Fremantle Prison has had a considerable amount of archaeological work completed within its walls, the majority of which has been commissioned in response to compliance based outcomes relating to Fremantle Prison's conservation and management plan (Building Management Authority of Western Australia 1990) and as such has had minimal interpretation (See Bindon & Raynal 1993; Bolton 2005; Burke et al 2009; Fleming 2008; Fleming & Burke 2009; Fyfe 2011; Eureka Archaeological Research and Consulting 2010, 2011; Kerr 1992; McIlroy 1990; Winter et al 2010). In addition the 2012 Memorandum of Understanding between Fremantle Prison and the University of Western Australia has seen a number of teaching field schools completing excavations and surveys within the prison compound (Haast et al 2013a, 2013b).

Several major research projects have been completed in relation to Fremantle Prison. Bavin (1994) focused her research on the experience of prisoners throughout the 19<sup>th</sup> century through her analysis of the three main prisons within the Swan River colony at the time. Bavin (1994) concluded that control and punishment were paramount in the physical structure and prisoner treatment procedures of the prisons. The construction of Fremantle Prison as a public works prison was largely considered to conform to developments in penal ideology seen in Britain which reflected the importance of moral management through religious instruction and reform through constructive employment (Bavin 1994, p. 474). On an economic front Bavin (1994) highlighted the continued evidence of the importance of cost-management and the developing importance of self-sufficiency at Fremantle Prison. This was primarily acknowledged through the vast difference in internal production between the workshop industries of Fremantle Prison and comparative absence of them at Perth Gaol and the Round House. Bavin considered the workshops to represent a cost reduction technique rather than an earnest training facility given the poor quality output of the workshops seen through her excavations.

In addition, the uniformity of goods recorded within the analysis was interpreted to relate to the increasingly private nature of the prison environment in the 19<sup>th</sup> century; both as a punishment as well as a way to separate the prison population from the wider community.

Both Mein (2012) and Nayton (1998) excavated the space underneath floor boards within the main cell block, recovering material culture from private spaces within the prison in contrast to Bavin's public spaces (Burke 1998). Nayton's analysis, among other findings, reported evidence of smuggling through the vent system between prisoners, illustrating the internal illicit economy that existed within the prison. Mein (2012) criticised the analysis of both Burke (1998) and Nayton (1998), citing a lack of consideration of historical documentation and site formation processes in their analysis. Her analysis highlighted the multitude of items within her assemblage that were available for purchase from the prison store and considered this as evidence of the prisoners working within the established monetary based reward system to ameliorate the boredom of prison life and express their identity. Both Mein (2012) and Nayton (1998) highlight the potential mechanisms in which both official and unofficial economic systems have existed within the prison, highlighting the economic variation that exists despite the institutionalised experience.

### 3.1.4 Economic Theory and its Efficacy within Historical Archaeology

Pertinent to any consideration of the WA colonial economy is the ability to link the local area of study to the global processes of capitalism and colonialism. A global approach to archaeology, as advocated in works such as Orser (1994b,2008) and Deagan (1988), highlights the necessity of considering various scales of influence in historical archaeology given the increasingly globalised nature of the world post-1500. While this school of thought has been criticised as ignoring the small scale in favour of developing an overall picture

(Gilchrist 2005), proponents argue that individual sites are influenced by a variety of community links: as such individual sites are a localised representation of larger scale phenomena (Carroll 1999). Capitalism as a global concept has been interpreted as an ideological phenomenon which is recognised through the routine practices of individual proponents of that ideology (Daglish 2001). Evidence of these routines, as seen in archaeological remains; represent the localised outcome of an interaction between global ideologies and the impact of local environmental factors. For the purposes of this study, the sites under consideration are representative of specific actions based on the priorities of the penal system and WA economy, which has in turn been informed by capitalist and colonial ideals.

Capitalism and colonialism are largely considered as the triggering factors that have resulted in a level of global interconnectedness in which people, goods, knowledge, and ideology have been transmitted worldwide through international trade networks. The analysis of these global networks must begin with authors such as Wallerstein (1983), who developed his World Systems Theory based on exchange relationships between core and periphery states and the reliance of these states on one another for the transference of primary and manufactured goods. Under Wallerstein's model Australia has been interpreted as a semi-peripheral nation which exploits the capital of the core nation to develop production ability while having a similar culture and living standard (Jeans 1987, p. 59). This model provides an initial understanding of the relationship between the Western Australian colony and the Crown in its early production ability and an understanding of the value of raw material production both locally and to the global economy.

In order to consider the economic value of the penal system to the Western Australian economy archaeologically, material culture must be considered as the remains of commodities and as evidence of an exchange relationship between the penal system and the wider Western Australian economy. The commodification of goods that developed with the spread of capitalism has

resulted in the ability to analyse artefacts as evidence of the item's role as a commodity to both the consumer and producer of the good (Orser & Fagan 1995, p.87; Staniforth 2003). By considering artefacts as commodities, they can be used as evidence of larger scale trade networks and can link the role of the individual to wider economic and social networks (Riordan and Adams 1985). From this perspective artefacts are evidence not only of individual agency but also their position and interaction with multiple scales of social and economic processes (Orser 1994a).

Archaeology has long drawn from Marxist ideology in relation to capitalism, analysing the social effects that developed in relation to a commodified society and its reflection on material culture, in particular the separation of worker and land owner (Croucher & Weiss 2011, p.8, Silliman 2006). Marx defined capitalism as a social relationship in which workers must sell their labour to the owners of resources and argued that, given the central role of labour in production, discussions of commodities should consider the social conditions through which those items were produced. Following Marx, major studies of capitalism in historical archaeology have focused on the social structure and cultural behaviour associated with capitalist production modes. Critical archaeology, beginning with the research of Mark Leone (1987, 1990) was built from a Structural Marxist approach which emphasised the power of ideology, or the assumptions people have about society, as the force that maintains exploitative relations between the dominant and subordinate classes within society. The Annapolis project and the development of the 'Georgian order' is perhaps the most well-known example of this school of thought (Leone 1990; McGuire 2006, pg. 131). The project attempted to show that architecture, landscape, and material culture of the city established and reinforced the 'Georgian order' of individualism, rationalism. and discipline and had been manipulated to reinforce the ideology of modern capitalism (Johnson 1999; Paynter 1988; Deetz 1977).

While consumption of material culture was initially seen by archaeologists as a passive reflection of the resources and commodities available within a community, studies have since developed to consider consumption as an active social process (Cook et al 1996). The purchase of goods is now commonly considered as a communicative act in which people represent themselves as well as maintain and develop social relations (Carroll 1999). Commodity consumption has been used within archaeological research as a symbolic representation of established social distinctions and identity that does not solely reflect socioeconomic differences (Mullins 2008, p.196). While consumption by the penal system is the central focus of this thesis, it is the transfer of capital in exchange for the consumer goods between the penal system and the wider WA economy which is the target of this study, as opposed to an analysis of the symbolism behind the items consumed.

The analysis of Australian convictism by economic historians has focused on the debate relating to the motivations of the British in relation to the establishment of Botany Bay as a penal colony. While early scholars accepted that settlement was primarily motivated by the urgent need to rid the home country of an overflow of felons, economic historians (Blainey 2001; Frost 1975a, 1975b; Gillen 1982) argue that the removal of convicts alone was not sufficient justification for the development of the penal colony. Analysis of NSW transportation has focused on the consideration of the wider economic and strategic needs of British at the time. Given that transportation to NSW commenced 60 years earlier than Western Australia, under significantly different ideological and strategic reasoning (Winter 2013a, p. 38), the economic analysis used to consider the value of the convict system in the Eastern States cannot be considered to be representative of the Western Australian situation.

Statham (1981a, 1981b, 1981c, 1985,1996) is largely alone in her economic analysis of the introduction of convicts to Western Australia. Her work focuses on relating colonial attitudes surrounding the introduction of convictism into

Western Australia to economic considerations. Specifically she considers the economic situation of the Western Australian colony from initial colonisation through to the beginnings of industry in the 1830's and which aspects of society benefitted from the introduction of the convict system. Statham's analysis dismisses the claim that convictism saved the Western Australian economy from collapse instead opting for a much more reserved analysis highlighting the benefit to the economy based on the three key benefits of increased population, increased market, and the construction of public works (Statham 1981b). Her analysis is limited by the insistence of considering the convict system primarily in binary terms of either required, and therefore a positive impact, and not required, and therefore negative limiting the significance ascribed to the convict system.

Previous economic studies relating to the Western Australian colonial economy in general have focused on the impact of isolation on the development of the economy (Blainey 2001) the development of the key export 'staple' industries of whaling (Heppingstone 1973), wheat, wool (Lourens 1979), mining (Gibbs 1997), and sandalwood (Statham 1990), as well as the use of forced labour in the development of industries such as pearling in the state's north-west (Hartley 1995; Nayton 2012; Paterson 2011). The focus on primary production by economic historians is indicative of the state of the Western Australian production ability prior to the convict period. Manufactured material was limited primarily to building materials with the market remaining too small to support the local development of other manufactured goods and the isolation of the colony resulting in minimal access to the global trade network (Statham 1981a; Winter 2013c, p.143).

While the analysis of the convict system as an expansion of the local market for goods has been considered by Gibbs (2001), Hartley (1995), and Statham (1985, 1981a, 1981b), these works provide little detail into the specific mechanisms through which the introduction of capital infiltrated the economy. As such the previous studies are largely limited to broad statements regarding

the economic value of increased population on the local market and the expenditure that occurred as part of the establishment of the bricks and mortar of the system. While many studies have highlighted the purchase of food and other essentials as the main stimulus to the local market, this study is interested in using archaeological material to provide specific details on the items purchased through varied aspects of the penal system to highlight the potential variation in expenditure based on circumstance. While the assemblages sampled are related specifically to aspects of Fremantle Prison, they are considered in this study as an initial investigation into potential variation within the penal system, and subsequently a consideration of the value of providing further detailed analysis of specific consumption choices related to varied aspects of the penal system.

### 3.2 Theoretical Basis

The economic impact of the penal system on the West Australian economy, specifically the goods and services demanded by the system, will be examined through the use of several macroeconomic concepts which will form the theoretical focus of this thesis. Traditional views of convictism in WA have focused overwhelmingly on the consideration of convictism as a binary concept of either positive or negative, with the negative school downplaying the impact of the convict system in an attempt to erase its importance from history (Millett 2003, p.13). Recent approaches have instead highlighted the nature of the convict system as a transformative force on the colony. An assessment of the economic transformation will enable a finer grained analysis of this transformation by highlighting how varying aspects of the penal system had difference impacts on the economy.

It has previously been established that the penal system represented a large influx of capital into the local economy (Gibbs 2006; Statham1981a; Winter 2013a) based on the payments required to maintain the penal system in the form of both wages and institutional purchases. The following concepts



highlight the method through which an injection of capital circulates and grows within a local economy based on widely taught Keynesian economic models. The production and use of models within economic theory relies on the idealisation from reality in which concepts are abstracted, omitted, or simplified in order to reduce economic practices to pure rational processes (Morgan 2008). In doing this economists isolate specific economic processes from the complication of multiple economic phenomena occurring simultaneously within the real world. Economic models act as an intermediary between theoretical concepts and the data that the theories are applied to: in doing so creating an idealised understanding of an economic process based on a simplified version of real world practices (Morgan 2008, p.4) While economic theories are used to interpret and understand real world behaviour the models will always be limited by the abstraction away from reality that must occur in order to isolate specific phenomena (Lucas 1980, p. 697).

### 3.2.1 Circular Flow of Income

The Circular Flow of Income is a model which explains the reciprocal relationship between the supply of goods and services and the circulation of capital and monetary flows (Crompton et al 2006; Gillibert 2008; Murphy 2003). This model explains how the injection of capital from the penal system cycles through the economy multiple times, and how the purchase of imported goods reduces the impact of that expenditure by removing the capital from the local economic cycle. This model also illustrates why the WA economy struggled to develop prior to the introduction of the convict system, as previously considered in chapter 2.

Gross Domestic Product (GDP) is measured as the sum of all transactions that occur within the circular flow and is the most common measure of a country's economic performance based on the value of all final goods and services produced within that economy (Costanza et al 2009, p.3). By considering the impact of the penal system on WA's GDP, an informed understanding of how the penal system impacted the colonial economy can be developed. The

Circular Flow model illustrates that the transfer of capital in exchange for goods and services is a continual process between firms (the producers) and households (the consumers) and that the commodities found in the historical and archaeological record can be used as evidence of how the transfer of capital from the penal system to the local economy occurred.

### The Circular Flow Model

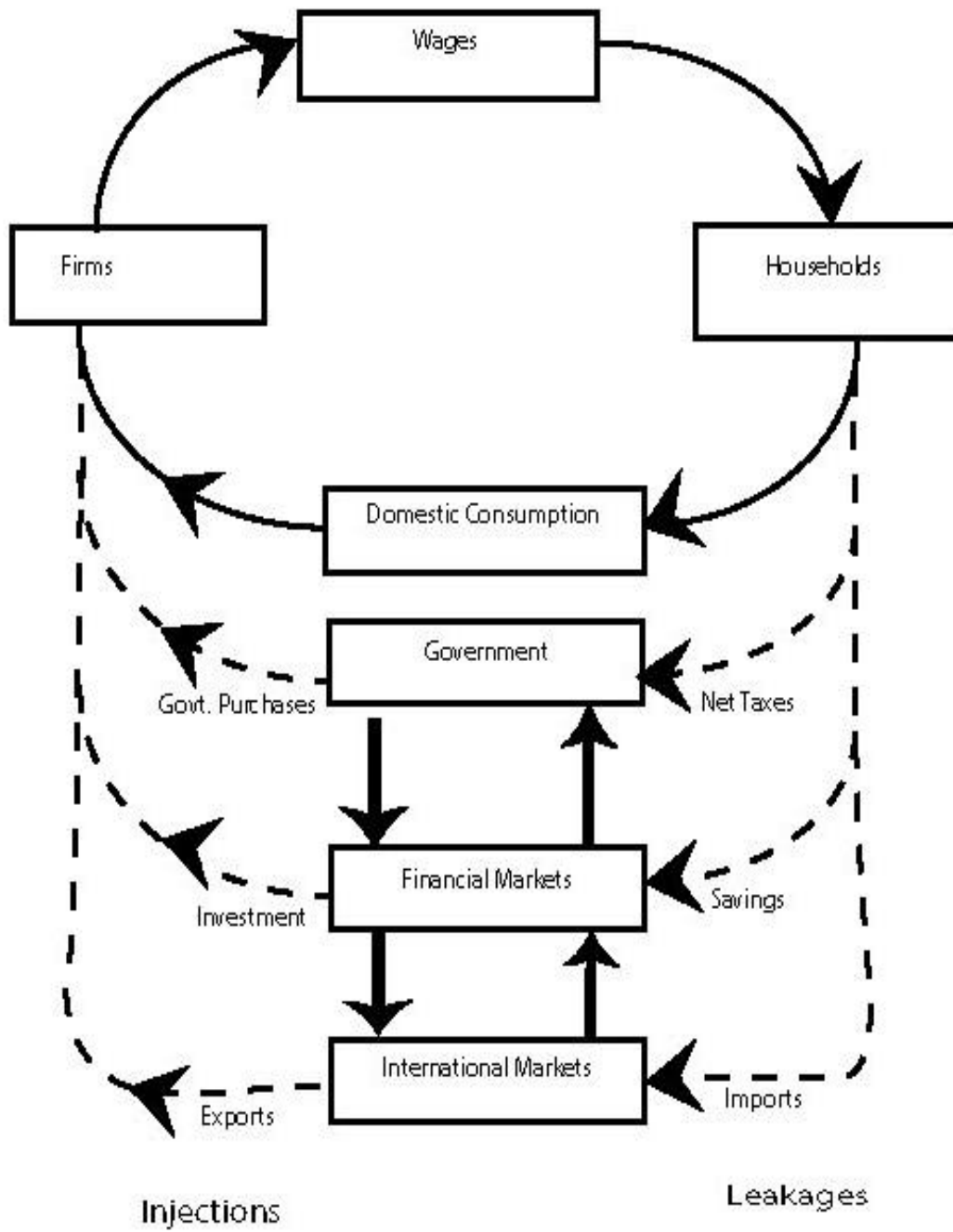


Figure 3-2: The Circular Flow Model, Based on Crompton et al 2006, p.191

The simplest form of the circular flow model looks at the closed economy. There are no imports or exports of goods, services, or money. The model assumes all goods produced are purchased and that the income derived from those purchases is distributed and subsequently spent in its entirety on further goods and services in the local market in a continuous cycle: In this, one man's spending becomes another's income.

Expanding this model to incorporate an international sector gives a more realistic picture. In an open economy, portions of capital will be lost from the domestic cycle through the purchase of imports, personal savings or government taxes: these represent 'leakages' to the circular flow. Leakages result in the removal of capital from the circular flow and the reduction of economic output. In the years leading up to the introduction of the convict system the Western Australian market was dominated by the leakage of capital out of the economy through the purchase of imports without the ability to offset this leakage with a corresponding capital injection as is represented by the negative balance of trade in earlier colonial life (Hartley 1995). Conversely, capital can be injected into the economy through exports, government spending, and investment which increase the amount of capital cycling through the economy and results in a higher economic output (Crompton et al 2006). The spending of the penal system subsequently represents an injection into the circular flow and consequent increase in income for the businesses that supply the goods and services bought using British funds. By analysing how the capital of the penal system was initially injected into the economy and which aspects of that dispersion represented a leakage in the form of imported commodities it will be possible to highlight specific areas of spending that had a larger impact on the local economy and how different purchasers had a different impact based on their spending priorities.

### 3.2.2 Keynesian Multiplier

Any portions of capital injected into the colony by the penal system, that were not immediately leaked out through imports, would trigger the Keynesian multiplier effect due to the cycles of spending that occur triggered by the spending of this initial capital (Amadeo 2008; Vaggi and Groenwegen 2003, p.299). The underlying assumption of the multiplier is that an increase in income results in an increase in consumption, in what Keynes considered a fundamental law of human action:

“The fundamental psychological law, upon which we are entitled to depend with great confidence ... is that men are disposed, as a rule and on the average, to increase their consumption as their income increases, but not by as much as the increase in their income.”  
(Keynes 1939, p.36)

Essentially, when a person is paid additional money he will then spend at least a portion of it- which increases the next person's pay, and spending: 'one man's spending becomes another's income'. The multiplier highlights the growing impact of the initial injection into the economy as it flows through as increased income, and subsequently increased expenditure. The impact of the multiplier – and thus the impact of the injection - is limited by practices that remove capital (leakage effects) from the circular flow including taxes, savings, and imports. By considering whether the consumption of the penal system represented the purchase of local or imported goods it is possible to consider not only what industries represented the focus on the penal system's expenditure, but also whether that expenditure remained in the colony in its initial spending cycles

### 3.2.3 Staple Theory

While the circular flow model highlights the impact of the capital injection on the colonial economy it fails to acknowledge the benefits of the penal system that resulted from the use of the convicts as a labour source and other non-monetary economic benefits that occurred as part of the penal system. Staple theory was developed as a methodology for explaining economic growth associated with the development of primary exports of newly developed colonial economies. Initially designed to explain the Canadian reliance on cod and fur trades (Watkins 1963), the '*staples thesis*' has since been used to examine the growth of several colonies which have a relatively small population compared to an abundance of land (Altman 2003). Staple theory assumes that the staple export represents the leading sector of the economy and as such sets the pace and direction of economic growth and public policy (Choy & Sugimoto 2013; McCarty 1964, p6).

This method posits that development is based on the export of a regional, widely available resource. The expansion of industries that are linked to that core export- through the development of the factors of production (land, labour, capital) - is required to sustain increased levels of output (Pomfret 1981). Staple theory maintains that a strong export is required for growth in colonial economies given the lack of a large local market to sustain growth (McCarty 1964). When demand for the staple product increases internationally, the quantity supplied by the country increases in response, resulting in an increase in income for the exporting country. This cycles through the economy via wage spending and investment- as is expected through Keynes' Circular Flow Model and income multiplier.

In the case of Australia, economists identify the staples as being whaling, sealing, wool, and - significantly to this thesis - convicts (Pomfret 1981, McCarty 1964). The convict system can be considered as a 'quasi' export in which the colony was exporting a 'convict-minding service', and receiving British capital to

do so. This convict-minding system led to the immediate growth of linked industries – theoretically, those related to the subsistence requirements of the convict population. It is hypothesised that an examination of the artefact and historical record will illuminate the industries which were directly impacted by the penal system and subsequently the avenue through which capital was transferred from the penal system to the colony. Following the circular flow model the initial injection of capital from the support of the convict system was then disseminated throughout the economy through additional cycles of purchases

‘Linkage effects’ within staple theory refer to industries and services that develop in response to increased demand as a result of increased use of both the inputs and outputs of the staple industry (Altman 2003, p.285). There are three types- backward, forward, and final demand (Table 3-1) and while only backward linkages will be considered within this study, each linkage type represents avenues available for considering the economic benefit of the penal system

Linkage Type	Impact	Example within the penal system
Backward linkages	Increased production and investment in products which form inputs into the staple	Food and clothing requirements of the penal system
Forward linkages	Industries that develop which use the output of the staple as part of their production process	Convict labour and their use on public works
Final Demand linkages	Industries that develop in response to an increase demand throughout the economy for consumer goods driven by the increased income of those producers who benefited from the other linkages	Development of local production of medicine based on the local markets increased purchasing power

**Table 3-1: Characteristics of Linkage Effects**

These linkages have varying impacts on the local economy based on how significant the linkage was in relation to proportional expenditure and how that linkage dispersed the capital through the production process (Watkins 1963, p.145). Industries and goods that source portions of their production process through imported material decrease the economic impact of the injection of capital by removing portions of the capital from the circular flow; conversely, industries that produce exports create further capital injections.



### 3.2.4 Applying Economic Theory to the Archaeological Record

Given the reciprocal relationship between the supply of goods and the movement of capital throughout the economy, material culture found and analysed as part of the archaeological process is representative of the initial transfer of capital from the penal system to the wider Western Australian economy. Analysis of the material record is intended to highlight consumption patterns, which represent specific linkage industries that received the majority of the initial benefit related to the consumption of the penal system, as well as how the distribution of expenditure varied between institutional and personal consumption.

Given the historical background of the WA colony, and its heavy reliance on imports, the material and historical record will be used as an indication of how much of the purchases related to imported materials - either in their final form or as part of the production process. In considering which purchases represent a leakage of capital out of the economy, and how significant these purchases are compared with the overall consumption of the penal system, there is the potential to consider whether the injection of capital resulted in greater benefit than its initial monetary value.

The relationship highlighted between a staple industry and its linkages will form the overarching theoretical basis of this thesis, with the items consumed by the system analysed to consider how much of the economic benefit would have been transferred to the wider economy. While ultimately the sample used within this study cannot provide a *comprehensive* analysis of expenditure by the penal system in the years considered; the analysis of these two samples can provide evidence as to the variance between how expenditure related to the institutional and private consumption of the penal system was distributed amongst the Western Australian economy, as well as how much of this benefit was lost through the impact of imports. If successful, the application of this analysis in further aspects of early colonial industry is intended to reveal the

mechanism from which the injection of capital is incorporated into the wider economy.

## 4. METHODS

This chapter highlights the methodology used to connect the archaeological and historical record of the WA penal system to an increased demand for locally produced goods over the study period. In order to achieve this, this study focused on two methods of investigation in an attempt to consider the penal system using multiple scales of information. The influence of the penal system was considered both as a large scale entity as well as a system that contained multiple groups, each of which had their own economic signature, and of which two examples are considered within this study.

Initially, to examine the penal system as a large-scale macro-entity, a critical analysis of financial records and tenders to the public was completed in order to understand how the system allocated expenditure and sourced goods as an overall entity. Secondly, an artefact analysis of archaeological material found in two rubbish pits within Fremantle Prison was undertaken. These assemblages reflected two distinct interactions with the local economy: those of the administrated requirements of the prison; and those of an individual's wage based consumption habits. The information from these two sources were then synthesised to provide evidence of the economic value of the commodities demanded by the penal system with reference to the various scales of influence and the context of the purchase. This study hypothesised that through the

combination of the analysis of the archaeological and historical record that specific goods and industries would be found to represent large proportions of the penal system's expenditure.

This methodology was developed with the intention of using the synthesis of archaeological evidence and documentary sources as part of pilot study to consider the feasibility of using economic theory as an interpretive framework to expand on archaeological analysis. In particular this preliminary approach considered whether artefacts can be traced through their production process as an indication of economic significance to the producer of the goods as opposed to the traditional consideration of artefacts in relation to those who consume them.

#### 4.1 Documentary Evidence

Documentary evidence served a dual purpose in this thesis providing the primary data for the broad scale analysis while also being used to contextualise the archaeological record in relation to colonial availabilities of those commodities represented. Historical records were largely sourced from online databases with a focus on Trove for tender documents and advertising records as well as the House of Commons Parliamentary papers which provided yearly reports on the convict system. Additional information was also sourced from physical archives at the State Records Office and Fremantle Prison library. Documentary evidence suffers from a range of biases in addition to the traditional biases brought to an analysis during interpretation by archaeologists. Documents, especially those entered as official correspondence, have an inherent bias given the conscious composure of the source that must be considered when considering accuracy of the information (D'Agostino 1995; Little 2006). Information available within the official records sourced for this study focused on large scale statistical returns, including expected expenditure, and was largely limited to the convict period in which the penal system remained distinct from wider colonial spending.

#### 4.1.1 Sources Relating to the Overall Demand of the Penal System

The vast majority of documentary sources relating to the convict system comprises of official administrative documents relating to the operation of Fremantle Prison and the general operation of the convict system (Winter 2013a the, p. 115). Analysis of recorded expenditure over time was used to show the changing priorities of penal system expenditure and highlight how funds were allocated throughout the various aspects of the system, specifically the breakdown of wages compared to commodity purchases throughout the convict and the post-convict periods. This analysis was used to develop a broad understanding of the variety of goods demanded by the penal system, how significant this expense was in comparison to wage expenditure and how the change in control in 1886 affected the types of expenses accrued by the system.

Source	Source Location	Sampling Strategy	Start Date	End Date	Comments
Advertised Western Australian Tenders	Trove	Single most prominent newspaper source of penal tenders for each year sampled every 5 years starting 1850	1850	1880	Penal tenders combined with larger colonial tenders
British Parliamentary Papers	House of Commons Parliamentary Papers	1852-1870, Excluding 1853, 1855, 1865-1866	1852	1870	British Parliamentary Papers cease to contain expenditure reports post 1871, Reports lacking standardisation or unavailable were omitted from analysis
Convict Finance Department Salary Books	Western Australian State Records Office	Single sample from Convict (1870) and Post Convict Period (1898)	1870	1898	Uncatalogued Records resulted in extremely limited sampling
Janet Millets Biography	UWA Library	Entire source	1863	1869	Local biographical account used to contextualise colonists opinion

**Table 4-1: List of Sources used in Documentary Analysis**

Tender documents were sourced using the Trove database of historical newspapers accessed via <https://trove.nla.gov.au/newspaper> and systematically sampled based on a 5 year interval beginning in 1850, as the year the first convict ship arrived in Western Australia and continuing until 1880, in which the tenders documents for the penal system were merged with the wider colonial government requirements (*The Herald* 24/10/1885, p.3). The sample interval was chosen with the intention of highlighting how broad functional requirements were tendered for over the entire period given the tenders use as an analogy for the types of materials sourced by the penal system. Tender documents retrieved from the trove search were only included within the sample if they incorporated specific reference to convictism, the Convict Establishment or Fremantle within the advertisement. This strategy was developed in order to remove tenders that potentially related to other Commissariat functions that could not be confirmed to relate to the penal system during analysis. Given the overlap of tenders observed simultaneously advertised in multiple newspapers, each year was sampled using advertising from a single newspaper based on the newspaper that represented the most prevalent source of penal system tenders for the year sampled. Search terminology was amended to remove reference to the Commissariat in searches post 1870 given the observed change in terminology observed during sampling and the lack of search results using previous parameters. The newspapers sampled and search terminology used for each year is featured in table 4-2.

Year	Newspaper Sourced (Circulation Dates)	Search Terminology
1850	The Perth Gazette (1833-1874)	Convict Tender Commissariat
1855	The Perth Gazette (1833-1874)	Convict Tender Commissariat
1860	The Perth Gazette (1833-1874)	Convict Tender Commissariat
1865	The Perth Gazette (1833-1874)	Convict Tender Commissariat
1870	The Perth Gazette (1833-1874)	Convict Tender Commissariat
1875	The Western Australian Times (1874-1879)	Convict Department Tender
1880	The Inquirer and Commercial News (1855-1901)	Convict Department Tender

**Table 4-2: Newspaper Sampling Strategy**

Given the lack of quantities attached to a large proportion of the tenders, each item was recorded using a binary opposition methodology, assigning a point to each functional category for each distinct item requested within the tender (see appendix 2). These points were subsequently converted to a percentage of tendered items for each sample year in an attempt to discern patterns in items tendered for based on function. Each item was assigned a functional category using similar categories applied to the artefact analysis with an additional category added to relate to the tender for the performance of services (See table 4.3). This was completed in order to be able to compare the functional breakdown of the goods that were tendered for to that of the artefact analysis.



Domestic:	Tenders relating to the supply of items used in a domestic setting including those related to hygiene, heating, lighting, bedding, and clothing
Structural:	Tenders related to the supply of construction material.
Subsistence:	Tenders relating to food or beverages
Labour:	Tenders that involved the request for outside labour as part of the tender, includes tenders such as those for cleaning and grain grinding
Indulgence:	Tenders relating to alcohol or tobacco consumption or development
Industrial:	Material related to industrial scale processes within the penal system, includes machinery and tenders for horse and carts
Other	Tender for materials that do not fall under any other category

**Table 4-3: Functional Categories used in Analysing tenders**

The British Parliamentary papers provided a report on multiple aspects of the penal system during Imperial control relating mostly to the administrative requirements of both the prison and the wider convict system (Winter 2013a, p. 118). Financial records were included in all half yearly Parliamentary reports and varied between reports of estimated and actual expenditure which was used to consider how the capital injected into the penal system was spent in relation to the administrative categories of the penal system. Parliamentary papers were sampled yearly from 1852-1870 omitting 1853, 1855, 1865 and 1866 due to lack of available information. The analysis considered three types of financial reports found within the British Parliamentary papers, consisting of initial estimates of yearly expenditure (E), estimates approved by the convict finance board (A) and actual expenditure (C) reported in the year after the expense occurred. A figure relating to actual expenditure was prioritised in years in which multiple types of reports were available.

### 4.1.2 Statistical Analysis

Expenditure figures provided from the yearly reports were subsequently compared to reported expenditure for the entire period found in the 1870 Parliamentary report which summarised the total yearly expenditure of the convict system from 1850-1870 (Wakeford 1870, p.544). A Kolmogorov-Smirnov comparison of the two data sets was completed in order to determine whether the variation between the estimated expenditure and the 1870 report was statistically significant. The Kolmogorov-Smirnov test measures the statistical probability that the values presented in the 1870 report would occur given the expected values reported in the estimates. The test provides a probability (p) value as an output which highlights the probability that if both samples were from the same data source that the variation would be as or more extreme than observed.

$p > 0.05$  = Cannot disprove the null hypothesis that both datasets are from the same source.

$p < 0.05$  = Null hypothesis disproved, the variance between the two datasets is considered statistically significant

### 4.1.3 Biographical Sources

The biography completed by Janet Millett (1980) relating to her time spent in the colony from 1863 to 1869 was included as corroborating evidence relating to attitudes of the colonists in relation to supplying goods for the convict system as well as towards to convict system in general. Her biography highlights the colonial attitudes towards various tender types and preferences towards supplying certain goods. While much of her evidence relates to life in the agricultural area of York and as such is biased towards an agriculturalist attitude, she highlights the varying level of enthusiasm through which tenders were sought.

While these sources provided a wealth of information relating to the scale and various types of expenditure allocated by the penal system, they can only provide a broad generalised understanding of the officially publicised demands of the convict system. As such while these sources were used to develop an understanding of the official expenditure of the penal system on a broad scale it is acknowledged that these sources provide an incomplete outline. This analysis was used to provide a basic understanding of the various avenues through which the penal system allocated funds and the mechanisms used to interact with the local economy on a large scale (Little 2009, p.403).

## 4.2 Artefact Analysis

### 4.2.1 Artefact Collections

Three artefact collections from previous excavations conducted on behalf of Fremantle Prison were considered for this thesis, with two being used within the analysis after an initial examination excluded the third collection as dating to outside the study period. The assemblages were systematically sampled based on prior analysis of the stratigraphic data in order to target specific use periods within the excavations (Orton 2000, p.21) The first assemblage was recovered in 2008 during excavations which aimed to discover the remains of the c.1862 metalled road within the Fremantle Prison parade ground (Burke et al 2009). The second was an assemblage from a privy excavated from the residence of No. 14, The Terrace, used to house administrative officers and their families throughout the time period (Sparkes-Santos and Stedman 2011). Preliminary analysis of these assemblages suggested that they were deposited in the mid to late 19th century and as such were appropriate for analysis given the target time period of both the convict and immediate post convict period. While these two assemblages will be used as a basis to test the feasibility of this analysis they cannot be seen as an effective sample of the whole economy. They are intended primarily to be indicative of the type of variety in economic

impact that can be seen at the micro scale of analysis as well as attest of process involved in tracing the artefacts as representations of commodities.

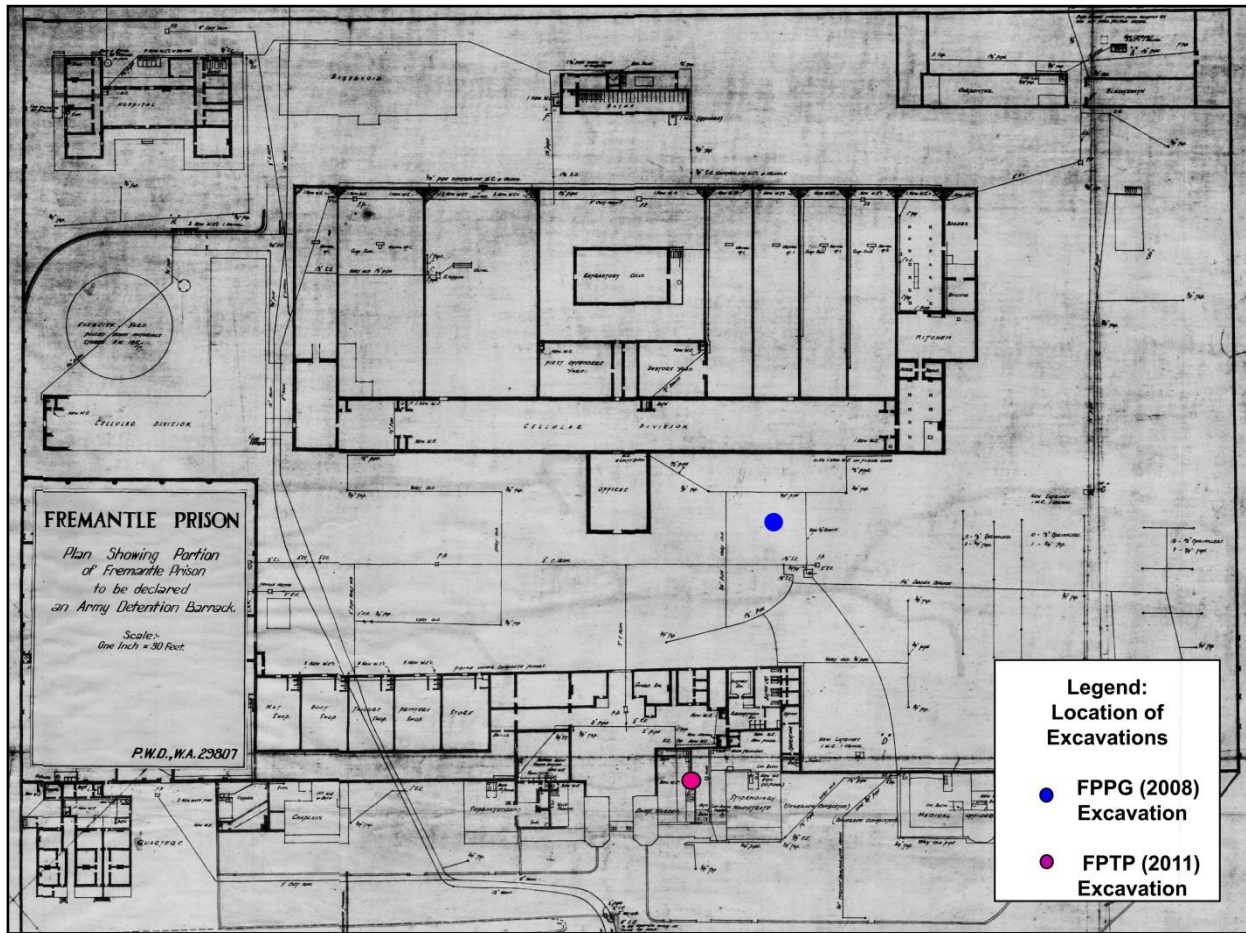


Figure 4-1: Map of Fremantle Prison including Locations of Excavations

#### Fremantle Prison Parade Ground (FPPG)

Excavation of the FPPG material used in this analysis occurred as part of a large scale excavation of the Fremantle Prison Parade ground run by Eureka Archaeology and Consulting in 2008 (Burke et al 2009). The excavation exposed a mixed rubbish pit which contained a variety of metal, ceramic, glass and bone artefacts, the majority of which were faunal remains. The pit itself was stratigraphically interpreted to be lying adjacent and potentially cutting into the limestone context considered to represent the remains of the metalled road; this interpretation in conjunction with initial observations during fieldwork suggests that the material removed from the pit dates to the mid to late 19<sup>th</sup>

century. Given the size of the deposit and the uniformity of material, in particular the large proportion of faunal material it is likely the assemblage relates to materials used by the prisoners and as such has been used to represent institutional based purchases.

#### Fremantle Prison No14, The Terrace (FPTP)

Excavation of the FPTP material occurred as part of the 2011 Watching brief and excavation related to No 14, The Terrace. No 14 was constructed in 1855, with additions made in 1897 and served initially as the Deputy Superintendent's living quarters (Sparkes-Santos and Stedman 2011, p.7). The privy associated with number 14 was excavated using single context recording and diagnostic elements analysed and dated as part of the initial analysis. The deeper deposits within the excavation contained a variety of cultural material dating to the mid to late 19<sup>th</sup> century and included a multitude of consumer goods including ceramic plate sets, toys and clothing. Given the location of the privy within the assigned living quarters of high ranking officers of Fremantle Prison it is likely the refuse in the privy is related to the inhabitants of the officers housing and their guests, and subsequently has been used as evidence of wage based consumption choices.

#### 4.2.2 Artefact Analysis

Archaeological analysis was undertaken in order to provide a detailed understanding of the material culture demanded by specific aspects of the penal system that the documentary record alone could not represent. This was completed in order to test the potential for variance between the priorities of consumption of two explicit aspects of the penal system, those of an institutional based purchase and those relating to the wage based consumption of a high ranking officer and their family.

Fremantle Prison was chosen for analysis given the high level of documentary information available relating to officially mandated spending and purchases. While various forms of illicit and unrecorded economic practices potentially have

existed within the prison system at various times, this analysis does not differentiate between materials obtained through official or illicit means past the acknowledgement of artefacts found that cannot be accounted for in official literature and may represent an alternate source. The material under analysis can both be confidently assumed to have been sourced by the penal system during the study period as well as represent a portion of the system which is heavily reported within the historical documentation and is thus ideal for analysis. Following Lawrence (1998), analysis operated on three levels: that of identification; function; and ideological associations.

#### 4.2.3 Sampling

While the majority of the artefacts available were considered in their entirety, the assemblage from FPPG contained multiple large bags of unsorted 3mm sieve residue containing large proportions of faunal material and limestone residue in excess of the analysis capacity of this research. A random sampling strategy was created which involved sorting 5 of 10 bags of material which included the re-sieving of material using a 1mm sieve to remove dust that had developed from artefact decomposition. Given the large population of faunal remains, the 0.50 sampling fraction was undertaken in order to provide a sample in excess of the minimum amount required to be considered representative accurate to a 95% confidence interval (Orton 2000, p.22). Faunal material was subsequently separated into identifiable and non-identifiable fragments based on the priorities of the faunal analysis that required faunal remains to have the potential to be identified both taxonomically as well as skeletally.

#### 4.2.4 Identification

Initially material was considered from a basic empirical perspective. All artefacts within the sample were identified and accessioned in to an excel database recording specifically form, dimensions, completeness, manufacture date and diagnostic features (Appendix 1). Identification of artefacts to the level in which they could be directly compared to commodities was paramount to

linking the artefact record to economy. Particular attention was paid to the faunal remains in which butchery marks, evidence of preparation, species and element were considered to develop an understanding of the preparation and likely source of meat. While most faunal remains were identified to species, bird and fish bone were only identified to class given the lack of reference material available. Faunal remains were identified using a variety of reference material (Adams & Crabtree 2011) including a preliminary training session in faunal identification provided by Dr. Tiina Manne. Additional resources were consulted for significantly fragmentary pieces including the use of comparative collections sourced through Murdoch University's Anatomy museum as well as the creation of a chicken reference skeleton through a process of de-fleshing a shop purchased chicken carcass through prolonged simmering.

Non faunal artefacts were identified using reference guides available for ceramics, metal and glass (Arnold 1992; Birmingham 1987; Boow 1991; Fletcher 1976; Godden 1999; Lindbergh 1999) with additional assistance sourced from amateur ceramic collectors through the Transfer Wares Collectors Club message boards (<http://www.transcollectorsclub.org/>). Identification focused on the potential of identifying manufacture location as well as original use in order to determine at what point in the production process the item entered the penal system.

Given the high proportion of fragmentation and refit potential of large portions of the ceramic and bone material, artefacts that refitted were accessioned as single items noting both the number of fragments and number of vessels/elements represented. Artefacts within the sample were given individual accession numbers and information recorded based on level of detail available from the artefact. Artefacts with no diagnostic information were accessioned in groups based on common features. Those artefacts that contained no identifiable features past designation of material type were weighed, counted, and recorded as a bulk finds.

#### 4.2.5 Dating

Accurate dating of each assemblage was vital to assessing the commodities in relation to their market price and therefore relative economic significance compared with the other commodities within each assemblage. Primary age ranges for both assemblages were developed based on stratigraphic analysis as well as additional reference provided through historical maps. Given the minimal information provided from both excavations and the historical record relating to these artefacts, material was primarily dated using formal characteristics of the artefacts themselves as described in Burke and Smith (2004, p.377-379). In addition ceramic material was dated using makers marks and technological typologies using reference guides available in Godden(1965) and SHA(2014). South's (1972) mean ceramic methodology was applied to the entirety of the datable assemblage and used as an indication of overall age of the deposit as well as a way to consider whether the variation in dating could relate to multiple depositions within the feature.

#### 4.2.6 Functional Analysis

Material was subsequently analysed for function based on broad functional categories (Table 4-4) developed using spending categories found in reports submitted through the British Parliamentary papers as well as categories found in the analysis used in similar works such as those by Winter (2013) and Casella (2001).

Functional analysis is the standard archaeological tool used widely in Australian historical archaeology which was primarily introduced to enable artefact collections to be considered based on their use as opposed to as evidence of typological development or their ability to date sites (Brooks 2005, p.7). In this study functional analysis was used to develop an understanding of what aspect of the prison system the assemblage represented in order to contextualise the artefacts and their place within the penal system, both chronologically and thematically. This was important given the running theme within the thesis that



archaeological remains provide a micro view of a small part of the system and as such each collection provided evidence of varying levels of significance to the economy based on both which personnel and what aspect of the system it represented.

By convention it was assumed that the function of an item was reflective of its primary 'purchase' use unless evidence of a secondary use was present. While polyfunctionality is a common consideration and highly likely in an isolated settlement, secondary use is difficult to pinpoint within artefact analysis and it has been argued that even when objects are used for a secondary purpose, most often they are also used for the purpose that they were made (Refer to Brooks 2005 p.10; Casey 2004, p. 32; South 1977; Lawrence 1998). In addition decorative items with otherwise utilitarian functions were grouped according to their utilitarian function despite potentially being motivated by social factors.

Domestic:	Materials used in a domestic setting, but not created to be a permanent feature in the landscape. These items included clothing and household items such as light bulbs and furnishings as well as items used in the preparation of and consumption of food and drink.
Structural:	Material used in the construction of a permanent feature on the landscape such as those related to buildings and other general construction. This category included items such as nails, brick and window glass.
Subsistence:	Material consisting of the remains of food or beverages including the remains of the food items themselves and the materials used to contain the food or drink. This included remains of tin cans, condiments jars and faunal remains. As a convention, fragmented bone and metal were assumed to be related to subsistence if otherwise unidentifiable.
Medicinal:	Material related to health or healing, included surgical equipment and glass bottles and jars with diagnostic Features indicating their use for medicinal purposes.
Indulgence:	Material related to activities completed for enjoyment. Included in this are items related to games and leisure activities as well as materially potentially relating to contraband and smuggled goods. This included Alcohol, Tobacco, Writing implements, and game pieces.
Industrial:	Material related to production activities completed as part of the workshop industries within the prison facilities.
Other:	Items identified but unable to be incorporated into the above categories.
Unknown:	Items that had no identified function.

**Table 4-4: Functional Categories Used In Artefact Analysis**

#### 4.2.7 Ideological Analysis

Documentary sources were used in addition to artefact characteristics to determine what commodities represented in the assemblage were sourced locally as well as how much of the production cycle was a local process. Artefacts considered within the assemblage were analysed and interpreted as a minimum number of commodities represented by the fragmented remains which were then compared to documentary sources to determine likely origin and potential cost of the commodities represented. This was attempted in order to provide a market value based valuation of the assemblages in order to compare the proportionate significance of various consumption choices to various local industries as a standardised monetary value of increased sales.

Shipping reports and materials recovered from shipwreck analysis such as those in Souter (2007) and Staniforth (2003) as well as newspaper advertisements were used in conjunction with the analysis of spending available in the British Parliamentary papers to attempt to determine what type of artefacts were imported into the colony and whether or not the import was the result of merchant requirements or directly sourced by the crown bypassing the local economy entirely

Each stage of the production process was assumed to add value to the item based on the labour theory of value developed by Marx (1887). For this initial analysis each stage of the production process (raw material procurement, manufacture and merchant selling) was weighted equally for the analysis. While in actuality each item demanded by the penal system would have significantly varied weighting for each aspect of the production cycle based on seller specific conditions, this cannot be accounted for using the evidence considered in this analysis. As such this analysis will not attempt to comparatively rank the benefit to each industry but rather consider each industry individually, to develop an understanding of what points in the production cycle were local for each artefact

type and as such which sectors of the economy benefitted by the items purchase.

### 4.3 Synthesis

A synthesis of the larger scale macro evidence and the micro evidence was used to highlight the variance between the overall impact of the system and the individual sections that result from the delineation of the system into separate tasks, locations and personnel. By matching the artefact record to its production process and industry the additional growth of the economy provided by the capital expenditure could be considered in terms of specific industrial benefits or 'linkages'. Tracing the artefacts through its production process allowed the benefit to the economy of the increased capital to be directly attributed to the specific items demanded of the local market. Following the circular flow model, commodities in which the entire production process is based locally will result in the entire economic benefit from the purchase of that good or service being integrated into the local economy, while items in which portions of production are completed internationally will provide limited benefit to the local economy. By determining which items were produced within the colony and which items were imported it was possible to highlight industries which had a greater economic significance to the colony and how varying aspects of the penal system interacted with these linked industries

# 5. RESULTS

## 5.1 Documentary Evidence

This section presents the results of the primary document review, focusing on the information provided in the British Parliamentary Papers, Convict finance board salary records and tenders advertised in Western Australian newspapers. This analysis aimed to illustrate the scale of detail relating to penal expenditure available through primary documents, and subsequently highlight the value and limitations of considering the penal system from this broad scale. Each documentary source was used to highlight the level of detail represented in official documents kept as part of the penal system as well as the evidence available relating to commodities demanded as part of the tender process. Both tender documents and portions of the record discerned from the British Parliamentary record are evidence of expected expenditure as opposed to officially recorded purchases, however they were both considered indicative of the types and variety of spending seen within the penal system.

### 5.1.1 Convict Finance Board Salary Records

While information regarding the geographic distribution of the penal system's expenditure is not available within either the convict or post convict period, the geographic breakdown of salaries as provided in the convict finance board salary records provides a basic representation of the geographic spread of expenditure. In particular, the variation between the two highlights the transition between the state wide convict system with multiple administrative avenues including the maintenance of public works programs and convict depots to a system in which only the management of the prisons themselves were the responsibility of the penal system. This contraction subsequently focused spending around the hubs of Perth and Fremantle with small wages spent in relation to the maintenance of regional gaols.

*paid February 1898*

1898					
February 1 <sup>st</sup>	By Cheque to Sup Genl Prison	Salary Jan'y 98	646	8	2
"	J.P. Mc	Supr Prisons	"	12	10 0
"	A.D. Stone	Clerk	"	10	8 4
"	Spaders Horns	Bunbury Increase from July 97	3	15	.
"	"	Buck Tasse Ditto	3	15	0
"	"	Leary Newcastle Ditto	3	15	-
"	"	Foster York Ditto	3	6	8
"	"	Quain " 16/31 July 98	"	8	4
"	"	Burrell Gatekeeper	"	16	8
"	"	Bailiff Officer Jan'y 98	3	17	6
"	"	Archer R.H. Colinton Clerk Sep 97	4	11	8
"	"	Townsend Salary & Allowances £1918.4			
"	"	Woolman 2/10 Allowances 12/10/97	34	18	4
					£ 728 10 8

Figure 5-1: Excerpt of Convict Finance Board Wage Spending February 1898 59

Given the uncatalogued nature of the salary records a single sample was taken from both the convict period and post convict period to use as a base comparison and illustration of the geographic contraction of the penal system that occurred in the 1870's. As part of this, salary figures were rounded to the nearest pound and calculated as a proportion of total spending for the expense period. Roles highlighted within the salary records without specific geographic responsibilities were considered as part of the executive administration and separated from regional sites and the combined central base figure representing Fremantle and Perth (see appendix 3). As evidenced by figures 5-2 and 5-3 there is a stark transition between the convict and post convict period, in particular in reference to regional spending which decreases from 38.5% of the salary expenses in 1870 to a mere 2.3% in 1898. Additionally the decrease in administrative spending from 26.7% to 4.1% would suggest limited requirements for staff outside of realms of Perth and Fremantle in the post convict period. These figures, while brief, provide evidence as to the stark geographic contraction of the penal system and growing importance of Fremantle and Perth in the post convict period. In particular these figures highlight the movement of funding away from the regional areas, as the extended functions of the penal system was reduced to the basic prison functions.

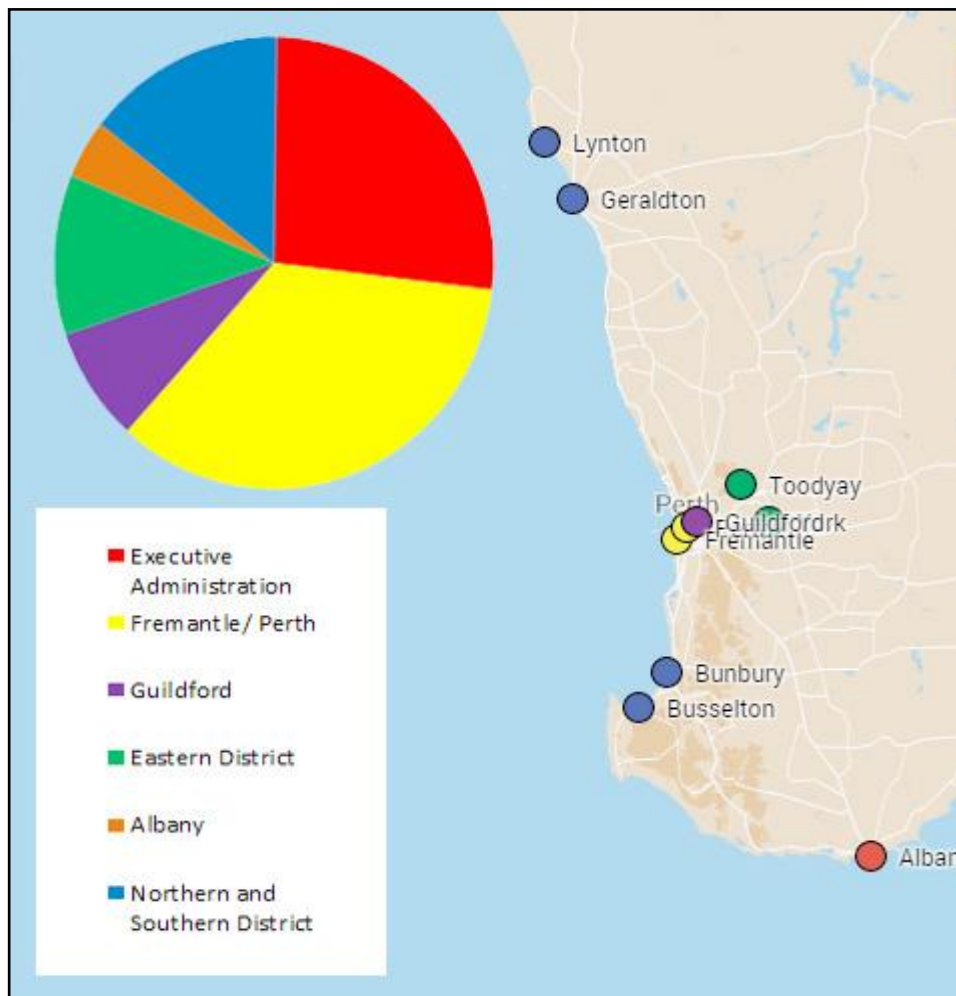


Figure 5-2 Geographic breakdown of penal expenditure 1870

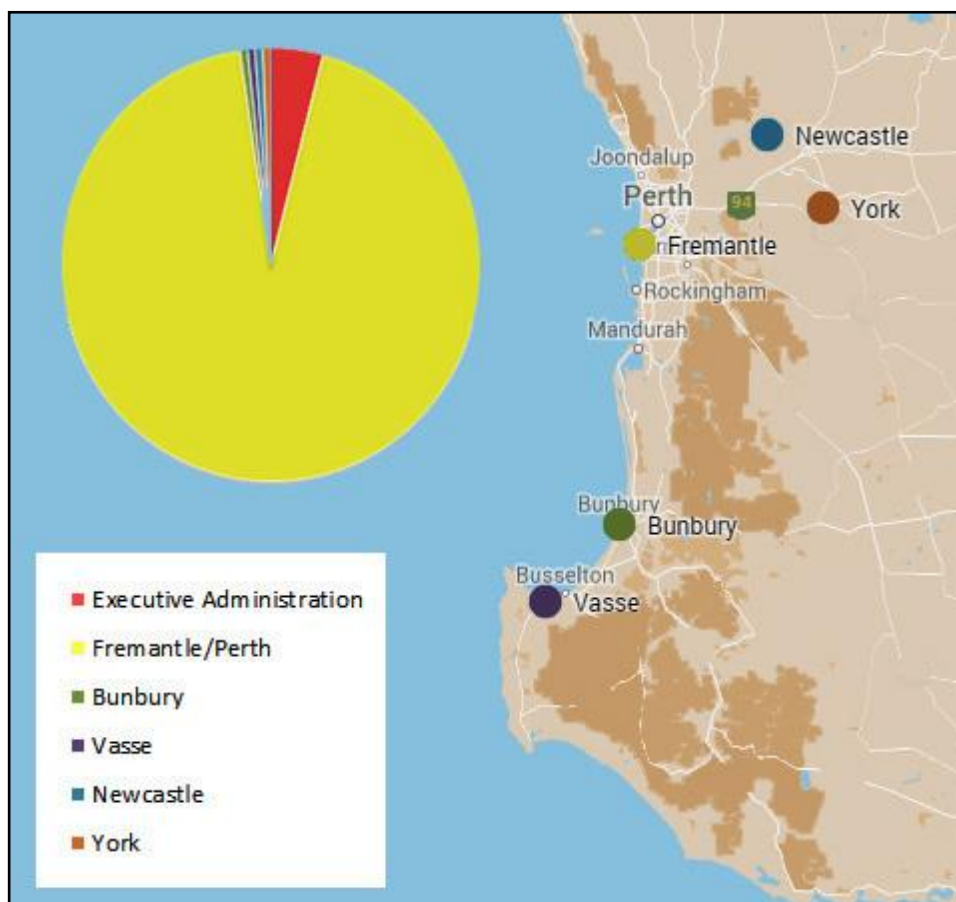
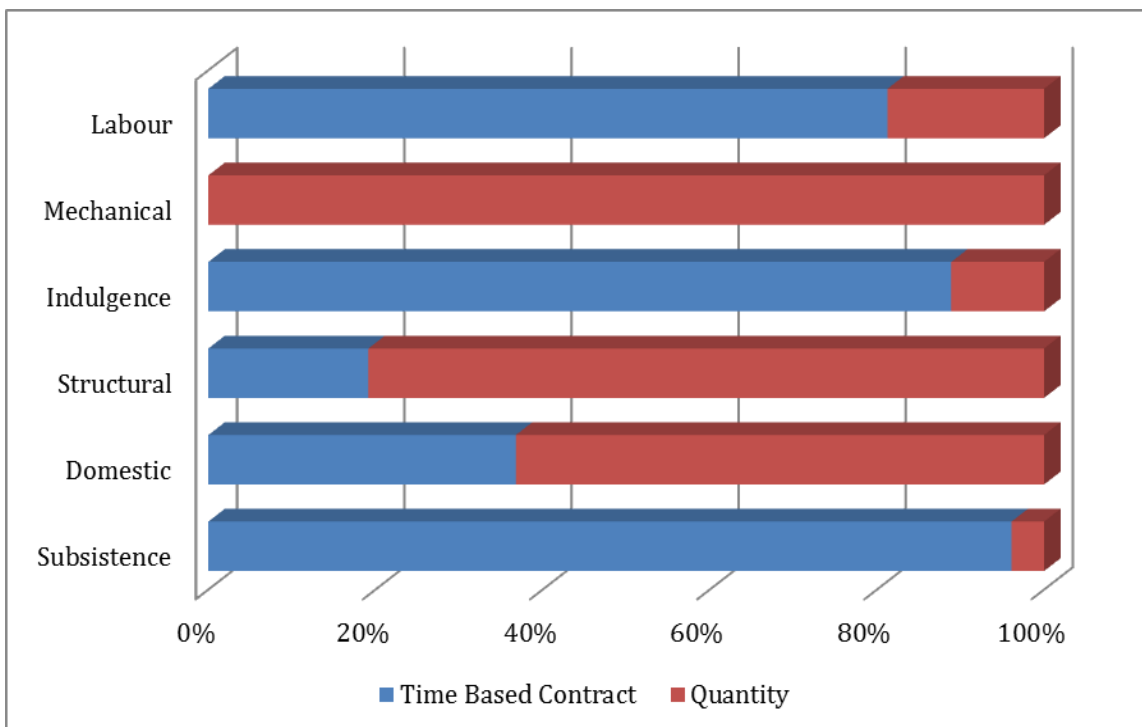


Figure 5-3: Geographic breakdown of penal expenditure in 1898



## 5.1.2 Tenders

59 newspaper tenders were analysed following the sampling methodology outlined in chapter 5. From this 261 items were recorded as having been advertised for during the sample period using a variety of tender methods including time based contracts and quantity requests.



**Figure 5-4: Breakdown of Tender Type by Functional Category 1850-1880**

When considering type of tender advertised (either a specific quantity or a prolonged supply), there is a clear functional basis separating how tenders were requested from the market. Given the varying requirements of the different types it is likely that tender type impacted to type of merchant who responded to the advertisements. Colonial attitudes highlighting a larger incentive towards time based ration contracts are highlighted by Millett's biography:

“Inasmuch, however, as to eat is a daily necessity and each prisoner and each warder whose business it is to look after him represents a person requiring to be fed, the government building contracts are somewhat less eagerly competed for than the contracts for supplying road parties and convict depots with rations.” (Millett 1980, p. 328)

Breakfast	Dinner	Supper	Other
- 1/6 oz, tea	-16oz. meat	- 1/6 oz, tea	- 10/16 oz. soap
- 3/4 oz. sugar	-16oz. potatoes	- 3/4 oz. sugar	- 1/4 oz. tobacco
- 12 oz. bread	-6 oz. bread	- 8 oz. bread	
	-1/2 oz. salt		
	- 1/4 drachm pepper		
	- 1 pint soup, thickened with 1 oz. rice, barley or oatmeal		

**Table 5-1: Recommended Daily Ration to Convicts based on Rennie (1857, p.65)**

Both subsistence items and domestic items were found to represent large portions of the tendered requirements in all the years sampled except 1860 and 1880 (Figure 5-4). The vast majority of items within this category were items representing the intended daily rations provided to the convicts including bread, salt, sugar, tea, meat, soap and clothing with additional tenders occasionally included for coffee, dairy products, vinegar and seasoning oil. While the majority of these tenders would suggest a focus on convict provisions the sourcing of blue broad cloth, crown buttons and key pouches indicate that supplies tendered through this method extended past the supply of basic provisions for the convicts.

In 1860, 2 of the 5 advertisements did not specifically the types of good requested, instead providing instructions for potential suppliers to obtain

information for the goods required from the commissariat. Tenders that did provide detail within the advertisement related to either specific single purchases such as seen in the tenders for construction of a boat ramp (*The Perth Gazette*, 16/3/1860), for a working horse (*The Perth Gazette*, 6/4/1860) or alternatively the supply of an item that had previously not been tendered for such as seen in the tender for coffins (*The Perth Gazette*, 6/4/1860).

**Commissariat Notice.**

**TENDERS** (*in duplicate*) will be received at this Office until Noon on **SATURDAY**, the 2nd Proximo, to supply, for the service of the Convict Department at Fremantle,

**SHEET IRON**, 1, weighing 2lbs. per foot superficial.

**SHEET LEAD**, 300 feet superficial, 5lbs per foot super.

These articles, upon being approved, must be delivered by the parties tendering into the Convict Depot free of expense.

Commissariat Office, Perth,  
W. A., Oct. 25, 1850.  
**H. C. DARLING,**  
*Assist.-Com.-General.*

Figure 5-5: Tender Advertised in the Perth Gazette, (1/11/1850 p.2)

Despite the available labour seen in the convict population, direct labour was tendered to the colony in each sample from 1855-1875. The most common of these tenders related to the cleaning and maintenance of both the privy and chimney systems representing 37.5% of tenders for labour throughout the period with tenders including both the labour and removal of waste material as part of its requirements (see *The Perth Gazette* 9/11/1855, 21/1/1870,

29/1/1875). While initially colonial labour had been tendered for tasks such as washing clothes, building fences and to transport provisions and convicts to the regions; the use of colonial labour decreased significantly in scope post 1865, with the cleaning and removal and waste material becoming the sole service role tendered for perhaps representing the decrease in scope of the penal system at the time. All of the tenders for labour can be interpreted as unsuitable tasks to be completed by the convict force based on required tools, skills and potentially consideration of gender roles. Of the 12 tenders that included labour, 7 required the supply of goods or equipment as part of the tender that made it unfeasible for the convicts to complete the task, this included grain grinding services tendered for 3 times, transport of provisions tendered for twice and construction tendered for twice. While the construction tasks did not necessarily represent extremely high skilled tasks, the additional requirement to supply the construction material and relatively small scale of the projects potentially highlights the motivation behind tendering for these labour projects. 6 of the tenders involved the cleaning and removal of waste, including the emptying of ash and cess pits. The three tenders for clothes washing seen in 1865 represent the only labour activity that could be considered a particularly gendered role however the lack of continuation for this tender through time suggests that gender appropriateness was not the motivation behind the tender.

Several items were requested throughout the tenders in several different stages of the production process which was most prominently seen in the tenders for grain and clothing. The first recorded tender for grains was advertised on 14<sup>th</sup> of June 1850 (*The Perth Gazette*) which requested tenders for the supply of bread for the Convict Establishment. By the 12<sup>th</sup> July 1850, a new tender had been issued for the supply of flour to the convict system which resulted in no submissions being received. In 1855 all tenders requested submissions for a year's supply of grain which was subsequently withdrawn given the high price and inability of local millers to process the grain. In the following sample years the tender for flour represents the most repeated tender within the sample year being present in 5 of the 10 tenders in 1865 and 6 of the 10 tenders in 1870

potentially indicating continued difficulty sourcing local flour either due to price factors or general shortages or an unwillingness of local suppliers to support the penal system

The production and repair of both clothing and shoes were at different time's part of the internal workshop systems of Fremantle prison (Young 1988). Initially tenders indicate that uniforms were made internally as indicated by the tender for a large variety of fabric as opposed to pre made clothing in 1850 (*The Perth Gazette* 29/11/1850). By 1865 tenders requested pre made clothing as well as boots in large quantities reflecting the inability of the convict population to continue to create their own clothing. The market continued to provide high prices for these requirements, as highlighted in the Despatch from Governor Hampton suggesting that clothing be imported directly from Britain given the high price and inconvenience of the local market.

“The suggestion of the accountant of stores, in the memorandum attached to the estimates, with reference to clothing being sent out on convict ships, is well deserving of favourable consideration, as inconvenience and increased expense have been produced by the necessity which has recently arisen for extensive purchases being made in the colony where the supply is limited” (Hampton 1863, p. 11)

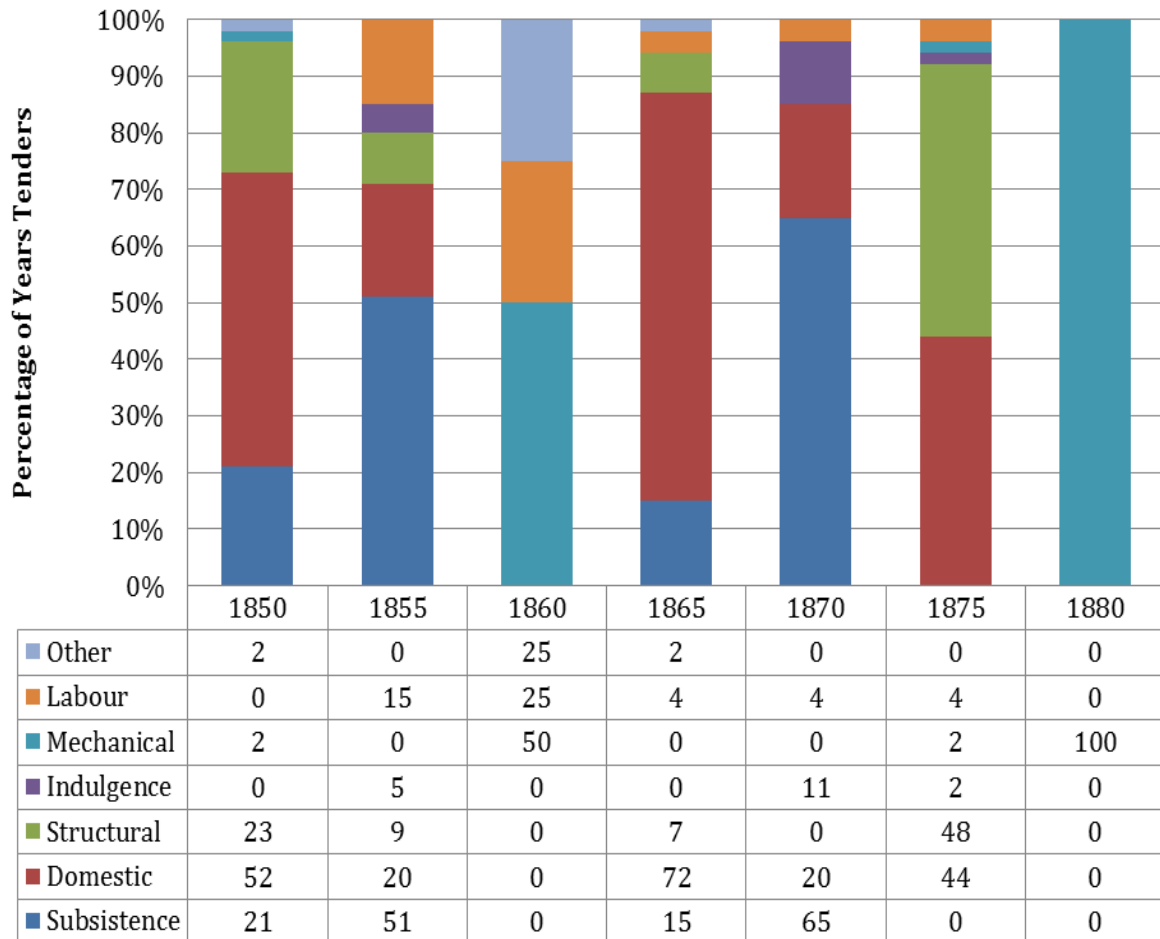
This appears to have occurred with annual clothing requirements ordered from London merchants, while local merchants were only contracted to if supply ran low (Young 1988, p.79). By 1875 fabric was once again being tendered for through the colony as well as a variety of materials required for the internal production of boots including shoemakers flax, leather kip and shoe bristles. The presence of these items is evidence of an internalisation of production perhaps coinciding with the reduction in public works and contraction of the penal system.

Indulgence items, in this case alcohol and tobacco were rarely tendered for representing 3% of the tenders issued over the sample period. Despite being part of the official ration provided to convicts, tobacco and smoking pipes were tendered for only once within the analysis in 1870 (*The Perth Gazette* 16/12/1870 p.2). This would suggest that tobacco was sourced directly from London and transported by the convict ships as suggested by Commissariat officer W.F Mends in 1852.

“As the convicts consume a very large quantity of tobacco, and the price of this article is at all times very high in this colony... I have the honour to submit for the consideration of the Lords Commissioners of her Majesty’s Treasury whether it would not be advisable to send out, by every convict ship, a quarter of a ton.” (Mends 1852, p. 233)

The lack of tenders prior to 1870 would suggest that tobacco and smoking pipes and were only tendered to the local market after the convict ships ceased in 1868.

## Functional Analysis of Goods Advertised for Tender



**Figure 5-6: Functional Analysis of Goods Advertised for Tender**

### 5.1.3 Evidence of Tenders not Being Filled Locally

While the advertisement of large proportions of the subsistence and domestic needs of the penal force would suggest a local focus in regards to sourcing material, various records indicate tenders not being filled locally either from lack of availability or through exorbitant local prices and low quality goods. The lack of response to tender is indicated early within the tender record with no tenders being received for the supply of flour on 12<sup>th</sup> July 1850 (*The Perth Gazette*).

Later that year the York Agricultural society held a meeting to discuss the rejection of the wheat tenders by the government. Government response to their enquiry highlighted the lack of availability of millers willing to grind any supply of wheat, with only one of the colony's millers responding their inquiries making the purchase of wheat imprudent (*The Perth Gazette*, 13/12/1850). This interaction highlights the agency available to both producers and consumers and how individual choices effect otherwise purely economic decisions. Lack of local availability and exorbitant prices was also highlighted as a problem in the 1864 Memo to Parliament which highlighted that the price of clothing within the colony where "the supply is very limited and price much higher than in England." (Hampton 1863, p.11) While this particularly seems relevant in the earlier years with tenders on basic provisions, the increasing complexity of items tendered for suggests that over time the market had grown to accommodate a larger variety of requests. This is seen readily in the comparison of tenders for spices and condiments between 1850 and 1875 which transition from requests for salt, pepper and vinegar to requests including linseed oil, lime juice, soda and arrowroot in addition to the previously tendered requests. Also seen in the later tenders were items such as basic machinery and the raw materials used in both boot making and cart wheel construction, this level of specialisation suggests the market was much more interconnected to global trade and subsequently able to source specialist goods.

While the tenders represent the intended purchases of the penal system there is variety of interactions and agency available to individual consumers and suppliers in the colony and in Britain that impact the fulfilment or non-fulfilment of the advertised tenders locally. In addition the tenders often fail to provide detail relating to the specifics of the commodities that were required and ultimately received reducing the information to broad commodity types. The tenders highlight the changing requirements of the penal system, in particular the level of production expected internally as seen with both clothing and grains. In addition the absence of material from tenders provide evidence of the



sourcing of material from outside of the colony highlighting the variation seen in production location and commodity source based on item type

### 5.1.4 British Parliamentary Papers

The British Parliamentary Papers on Convict Discipline and transportation provided yearly estimates relating to the predicted expenditure required to maintain the penal system on a biannual basis. Parliamentary papers were analysed from 1852-1870 with selected years omitted due to a lack of standardisation or data available (see figure 5-8).

A Kolmogorov-Smirnov test was applied to compare of the estimated expenditure records to the 1870's parliamentary report on convict spending in order to statistically confirm whether there was significant variation between the estimates used for analysis and actual expenditure figures. The comparison confirmed that the variation between the two datasets was not statistically significant ( $p=0.49$ ) indicating that statistically the yearly estimates provides an analogous representation of expenditure despite some variation.

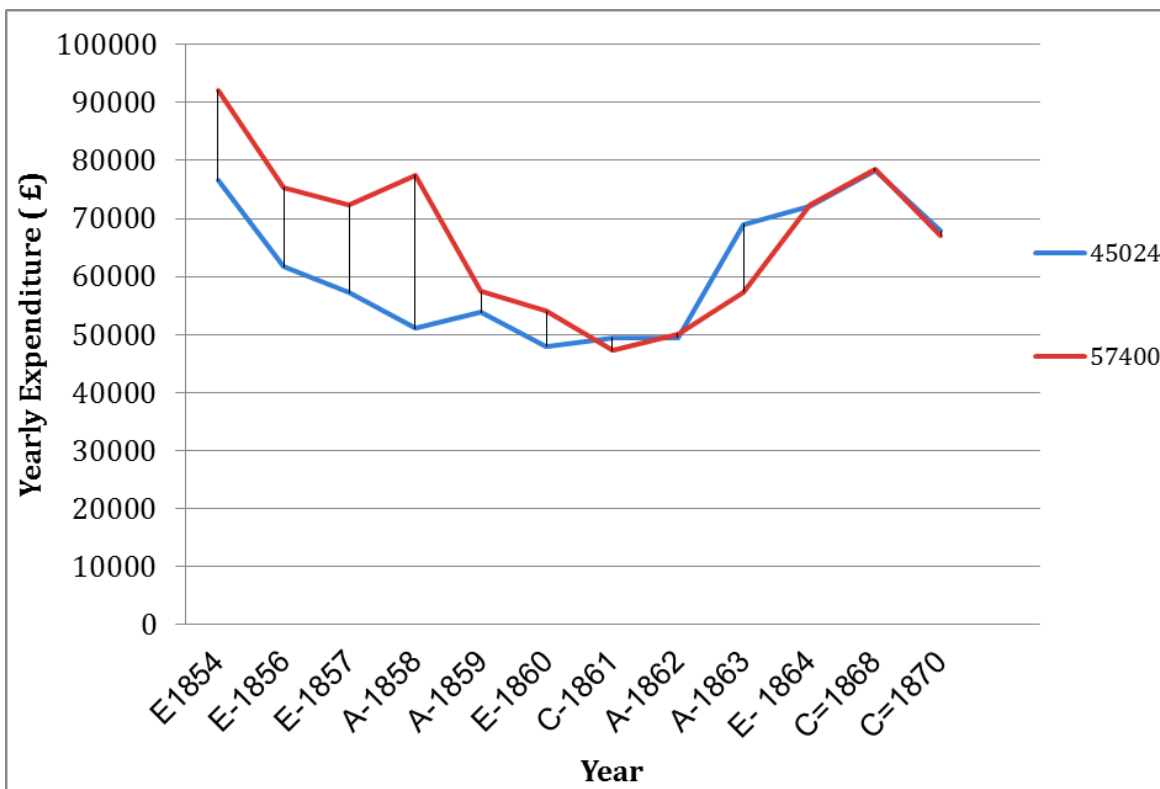


Figure 5-7: Comparison of Parliamentary Estimates and 1870 Summary Report

The expenditure estimated within this analysis equates to £1,726,410 within the 13 sample years. In all years provisions represent a significant proportion of expected expenditure, equating to 36.2% of the entire estimated spending. Analysis highlighted the large proportion of funds allocated to both the salaries of administrative officers and the monetary support of the magistrate office and police force representing 23.7% and 16.2% of overall expenditure respectively. Funding provided to the Police force was subsequently allocated to wages, provisions (including forage) and rent (Hampton 1863, p.17-18). The high proportion of salaries highlights the ability of individual wage based workers to have contributed to the demands of the penal system based on their wage based purchases. Expenditure relating to building and works and prisoner gratuities decrease over time reflecting the construction requirements and convict wage system at each point over the sample period

Medicine was not listed within expected expenditure until 1858, after which expected expenditure on medicines was largely consistently budgeted for ranging between £87 and £125 until 1868 in which medicine was reduced heavily. As medicine was not tendered for in local advertising the continued presence of a budget for medicine within the parliamentary records indicate an external source for the medicine needs of the convict system.

The breakdown of expenditure highlights the significance of salaries within the expected expenses of the penal system, as highlighted by the 6 categories that include some aspect of wage earning as part of its spending (superintendence, medical treatment, religious instruction, transport of provisions, police and magistrate, gratuities to convicts). The commodities purchased by these wages are a benefit rarely considered within the literature, which instead focuses on the role of providing provisions to the penal system through administrative purchases. Through the archaeological examination of the remains of the commodities purchased by these wage earners a more developed

understanding of the variety of way the penal system provided capital to the local economy can be developed.

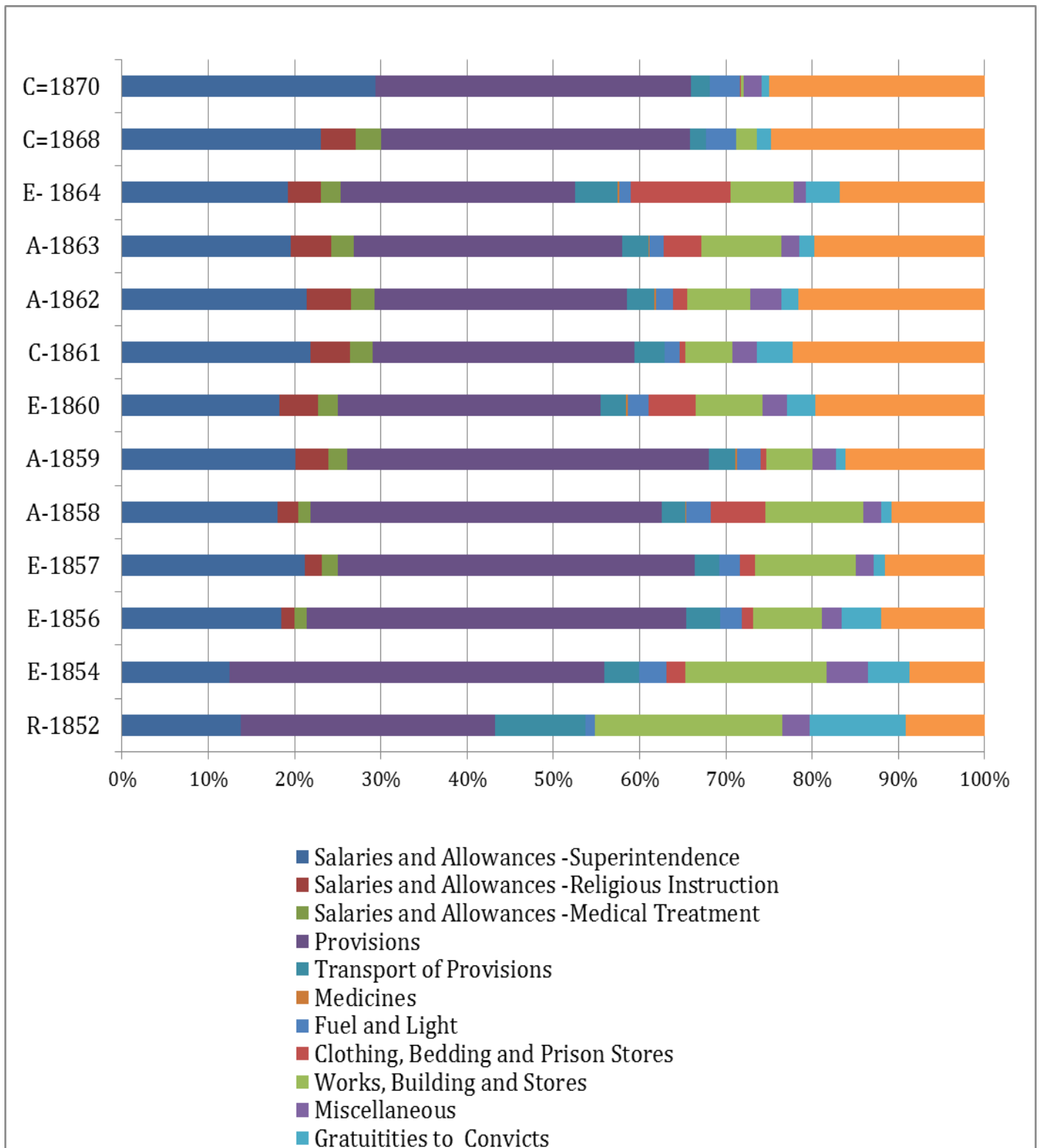


Figure 5-8: Breakdown of Estimated Expenditure 1852-1870

## 5.2 Artefact Analysis

Artefacts collected from the parade ground and terrace privy underwent three stages of analysis. Initially material was catalogued empirically and analysed for functional characteristics in order to provide evidence of the contextual relevance of the material to the penal system as well as attain approximate dates for both assemblages. From this both assemblages were analysed in order to reduce the artefact collection to a listing of recognisable commodities that were subsequently used to analyse the economic implication of the material remains represented by these assemblages.

### 5.2.1 Empirical Analysis

A large amount of material was recovered from both sites, however only artefacts from contexts previously determined to relate to contexts between 1850 and 1900 were considered. In total 6718 artefacts were accessioned using 796 accession numbers (Table 5-2). 9 Accession numbers were assigned to undiagnostic bulk finds with no recorded count amounting to 1505g of metal and 15,223g of Bone recorded but not analysed as part of FPPG's artefact collection. While FFTP analysed two contexts the find of several refits that combined both contexts led to the contexts being analysed as a single assemblage. Despite this, the majority of the artefacts from FFTP were sorted maintaining the initial contextual information and only combined in cases of refitting material. The entire artefact assemblage from both sites is attached as appendix 1.

Site	No. of Accession Numbers	No. of Artefacts	Average Artefacts per Accession Number
FPPG	281	4152	14.8
FPTP	517	2630	5.1
Total	798	6784	8.5

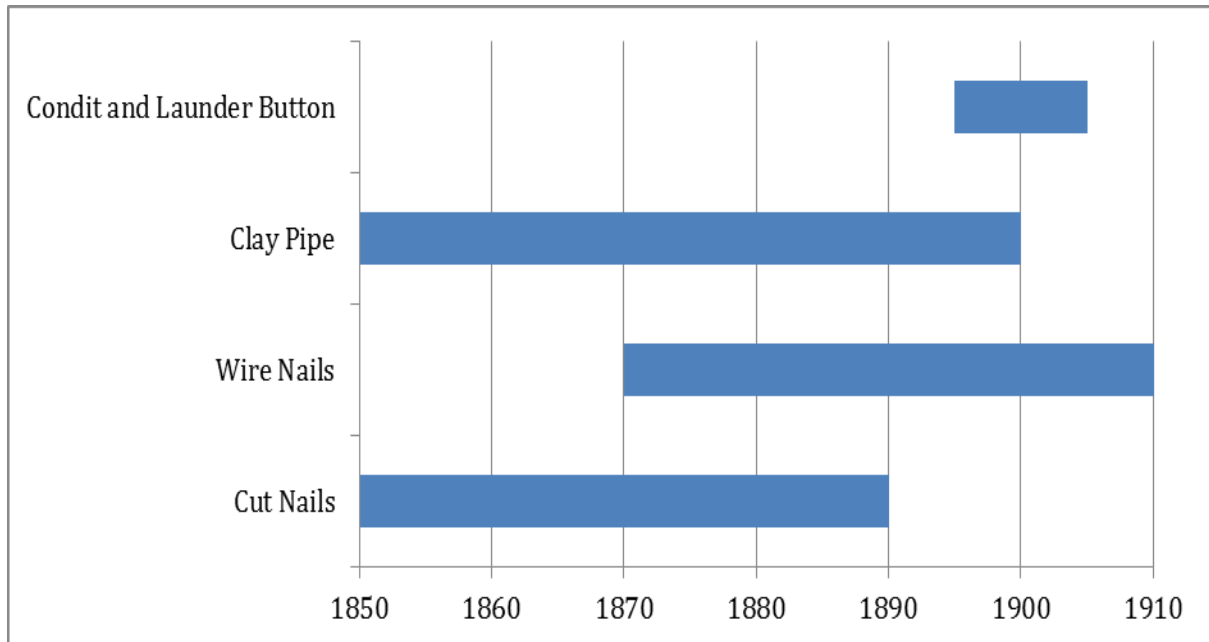
**Table 5-2: Empirical Summary of Artefact Assemblage**

### 5.2.2 Dating

While stratigraphy and historical information provided preliminary date ranges for the artefact collections, dating of the material largely focused on using diagnostic characteristics within the artefacts themselves.

Material recovered from the FPPG was dated stratigraphically to being simultaneous or younger than the context interpreted as the metalled road under investigation during the excavation (Burke et al 2009). The earliest description of the proposed road in the historical record dates to c.1862 which describes a road parallel to the main cell block in a communication between the Superintendent of Fremantle Prison and the Comptroller General (Lefroy 1862, pp. 178-179). Few artefacts recovered from FPPG exhibited any datable characteristics recovering only cut and wire nails with wide dates of use and extended potential for deposition given their use as a structural material and a single clay pipe fragment without any specific datable features. The button recovered with insignia designating it to Condit and Launder, Perth was dated using supplementary evidence relating to the development of the tailoring business ultimately bracketed by both the arrival of Condit in to the colony in 1895 (Western Mail, 18th July 1903) as well as the sale of the business and his subsequent death in 1903 (The Daily News, 10th September 1903) Given the large date range of clay pipes which would skew a mean date analysis, dating was primarily based on the button which was given an estimated date ranging from 1895 to 1905 based on the potential for a lag period to exist in the use of

buttons both by the producers who bought the business in 1903 as well as the owners of the clothing garment. Subsequently, an estimated date of 1900 was used for the analysis of FPPG.



**Figure 5-9: Date Range of Artefacts from FPPG**

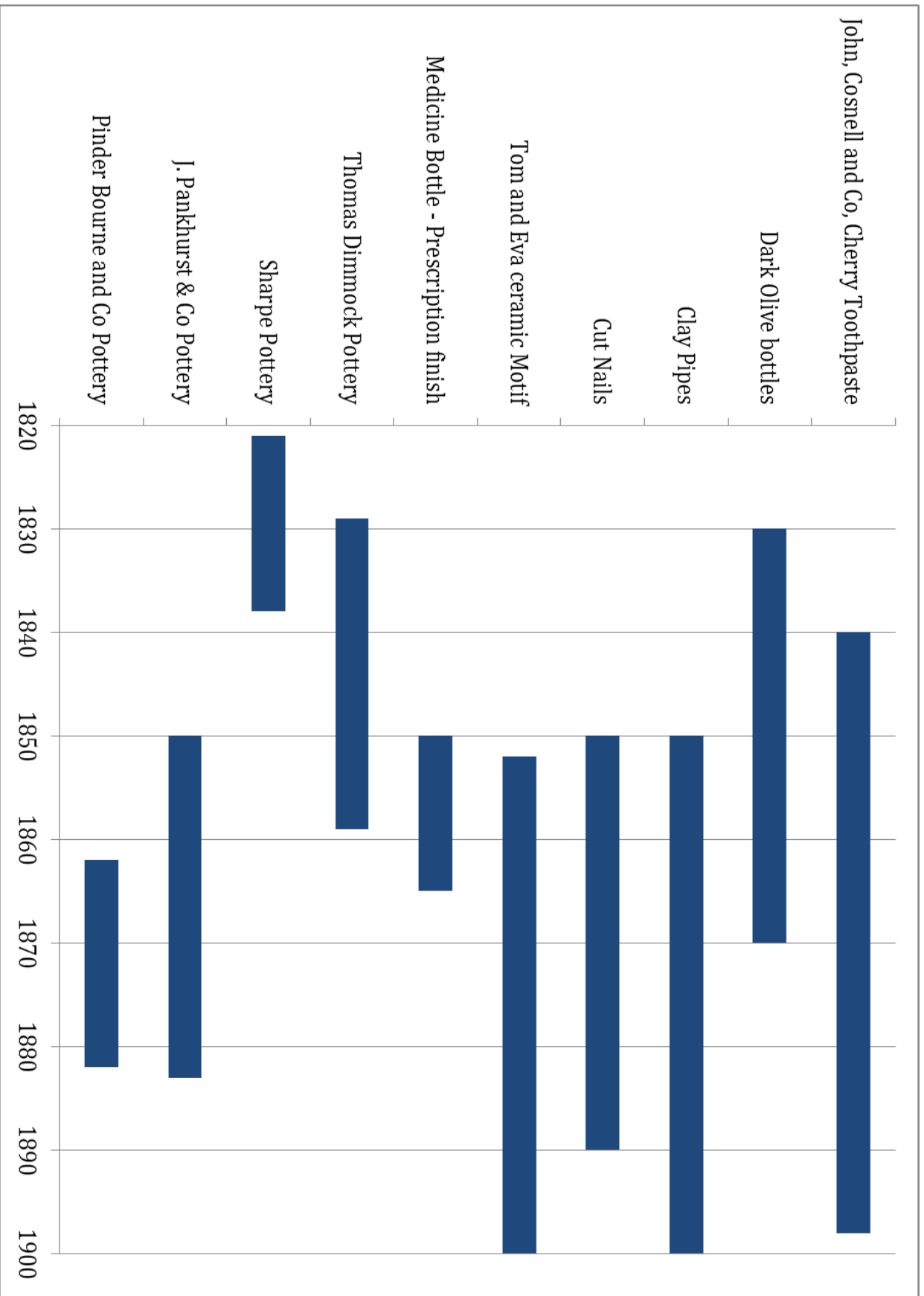


Figure 5-10: Date Range of Artefacts from FPTP

The Privy was initially dated to post 1855 based on its first appearance within historical maps. Preliminary on site dating of artefacts recovered from the surface contexts of the privy indicate that it was filled in the late 19<sup>th</sup> to early 20<sup>th</sup> centuries. Given the high number of artefacts recovered from the privy with dateable characteristics, Souths (1977) mean ceramic formula was applied to artefacts in which accurate TAQ and TPQ dates could be determined using reference material

The average TAQ amongst datable artefacts alone was 1838 highlighting the effect of continued use of artefacts and potential time lags between production and sale given the earliest possible occupation date of 1852, the year construction of the prison began. The average TPQ was calculated as 1875. Given that construction of Fremantle did not begin until 1852 this was used as the TAQ within the Mean Ceramic Estimation resulting in a mean date of 1864 for the FFTP assemblage which was subsequently used in analysing the production potential of the colony relating to the commodities of FFTP.



### 5.2.3 Functional Analysis and Commodity Analysis

Material was analysed using a functional basis in order to highlight the variance of the two assemblages. Table 5-3 shows the functional allocation of artefacts between both sites. While both sites have significant proportions of domestic, subsistence and structural artefacts there is a clear variation in functional priorities of occupation as highlighted by the variance in the indulgence and medicinal categories. Both the domestic and subsistence categories are significantly skewed in the results of FPPG given the omission of the bulk bone material from the artefact count for the subsistence category and the count of each individual brass shoe tack that inflates the relative significance of the domestic category.

Function	Site		Site	
	FPPG		FPTP	
	No.	%	No.	%
Domestic	2882	69.4	953	36.2
Subsistence	387	9.3	464	17.6
Structural	637	15.3	422	16.0
Indulgence	3	0.1	655	24.9
Industrial	29	0.7	0	0.0
Medicinal	8	0.2	43	1.6
Unknown	150	3.6	90	3.4
Other	58	1.4	3	0.1
Total	4154		2630	

**Table 5-3: Functional Breakdown of Artefact Collections**

## Structural

The building of Fremantle Prison, including the accommodation and working areas for both staff and prisoners was the responsibility of the overall convict system, and while the purchase of material required to build the prison represented commodities in its own right, the remains available of structural material are not representative of variation in agency between the two groups analysed for this study but rather an overall construction process.

Subsequently while structural material was recorded and calculated as part of the empirical analysis no attempt was made to interpret these materials in relation to commodities.

## Domestic Material

Domestic artefacts represented the most abundant functional category of both assemblages which in turn could be demarcated into several sub categories of function including: food preparation and serving, clothing, heating and lighting and health and hygiene.

## Food Preparation/ Serving

Given the highly identifiable nature and potential for refit seen in the ceramic material recovered from FPTP ceramics were accessioned per vessel where possible and temporarily refitted in order to provide an understanding of the type of vessels represented by the assemblage. Of the 375 ceramic fragments 50 distinct vessels were recovered representing a large variety of vessel types and including both group serving dishes and individual plates. By comparison FPPG recovered only 8 fragments of ceramic, the majority of which had no diagnostic features that could be used to determine vessel type (see table 5-4). In addition to the ceramic material, FPTP recovered a variety of cutlery including dessert and tea spoons as well a variety of serving glasses including general tumblers and stemmed glasses.

Some artefacts present evidence to suggest that they were brought in to the colony either by the penal system or as part of the baggage passengers carried

on their voyage. This is highly likely in the case of the Yellow ware baking dish, given that it was manufactured between 1821-1838, long before Fremantle Prison was occupied. Some commodities were also salvaged as illustrated by the transport of 31 table forks by the convict ship Lord Raglan which were subsequently reused by the Commissariat (Bosworth 2004, p. 16). These materials have no economic impact on the local economy given that their production and transport to the colony did not involve any interaction with the local market.

Food Preparation/ Serving Dishes	Material	Artefact	FPPG		FPTP	
			NISP	MNI	NISP	MNI
	Glass	Serving Dish	0	0	4	3
	Glass	Drinking Glass	0	0	31	5
	Metal	Fork	0	0	2	2
	Metal	Dessert Spoon	0	0	2	2
	Metal	Tea Spoon	0	0	1	1
	Metal	Bowl	0	0	1	1
	Bone	Knife	0	0	1	1
	Ceramic	Generic Vessel	7	na	64	na
	Ceramic	Plate	1	1	117	14
	Ceramic	Bowl	0	0	43	8
	Ceramic	Cup	0	0	10	3
	Ceramic	Egg Cup	0	0	9	5
	Ceramic	Jug	0	0	3	3
	Ceramic	Container	0	0	17	5
	Ceramic	Saucer	0	0	7	1
	Ceramic	Teacup	0	0	58	6
	Ceramic	Baking Dish	0	0	8	1
	Ceramic	Serving Dish	0	0	38	3
	Ceramic	Lid	0	0	1	1
<b>Total</b>			<b>8</b>	<b>1</b>	<b>413</b>	<b>62</b>

**Table 5-4: Summary of Food Preparation and Serving Dishes**

Several of the ceramic vessels recovered from FFTP contained maker's marks or identifiable patterns which enabled manufacturing location to be discerned (See table 5-5). All ceramic vessels that were able to be matched to a manufacturer originated from Staffordshire or Derbyshire in England indicating that a large proportion of the ceramics were imports. Subsequently these materials provided some economic value to the economy through the profit made through local merchants however the production costs involved in the vessels would have leaked out of the economy.






**Figure 5-11: Pinder, Bourne and Co - Bouquet Pattern**



**Figure 5-12: Tea Cup and Saucer Set**

While presence of individual high value ceramics has traditionally been used as evidence of status, Brooks and Connah (2007) suggest that the Australian market had little influence on the type of ceramic sent to the colony instead becoming a dumping ground for English ceramic in the time after the American revolutionary war. Subsequently they caution against using the presence of typically high status ceramics such as fine transfer wares and porcelain to indicate status. Lawrence et al (2009) in furthering this analysis highlights the value of considering both size and variability of ceramic assemblages in determining status difference in particular evidence of sophisticated dining a partial dinner service consisting of 1 large serving dish, 2 large plates and 3 small plates. The design of the set is intricate in its scalloped design and transfer print and represents 1 of 3 designs manufactured by Pinder, Bourne and Co within the assemblage. In addition there are multiple patterns of tea cups including a matching tea set consisting of 2 tea cups and a saucer. The presence of numerous ceramic vessels representing multiple varieties of dining sets including vessels for breakfast, dinner and tea suggest that the inhabitants of No.14 adhered to elaborate dining rituals. The value placed on owning the large variety of vessels indicated by these items highlight the value placed on adhering to these dining rituals by the inhabitants and subsequently represented an increase in demand for elaborate ceramics in matching sets in the local market.

Example	Manufacturer/ Place Of Origin	Manufacturing Date Range	Pattern Name	Vessel Type	No. Vessels
	Pinder, Bourne and Co , Staffordshire, England	1862-1882	Boquet	Serving Dish	1
	Pinder, Bourne and Co , Staffordshire, England	1862-1882	Rouen	Bowl	3
	Pinder, Bourne and Co , Staffordshire, England	1862-1882	Dulcamara	Small Plate	1



J. Pankhurst 1850-1883 Fern Leaf Small 1  
& Co , Plate  
Staffordshire,  
England



Thomas 1821-1838 Yellow Baking 1  
Sharpe, ware Dish  
Derbyshire,  
England



Thomas 1829-1859 Geneva Plate 1  
Dimmock ,  
Staffordshire,  
England



Originally ~1840-1920 Flow Blue Bowl 2  
Staffordshire,  
England

	Spode Ceramic Works, Staffordshire, England	Willow II	Plate	1
	Unknown	Rosewreath	Bowl	2

**Table 5-5: Summary of Ceramic Makers Marks FPTP**

### Clothing

An assortment of buttons, suspenders and shoe remnants were recovered from both sites. While these commodities are represented within both sites, differences in preservation have resulted in significant variation in the artefacts found from each site.

The majority of the buttons from both assemblages were generic and provided little information in regards to production method. A single button from FPTP was embossed with the crown insignia as seen in warden uniform buttons and subsequently would have been provided throughout the commissariat order process. The approximate date of FPTP places the buttons in a time period in which clothing was either imported directly from England by the commissariat (Young 1988) or requisitioned pre tailored from the colony. FPPG contained a button embossed with Condit and Lander, Perth, a local tailoring company. While both of these buttons potentially represent garments tailored within the colony in both cases the fabric required for the garments was imported as suggested by the lack of textile companies reported in the 1898 statistical register (*The West Australian 2/2/1900, p.7*)



Domestic	Material	Artefact	FPPG		FPTP	
			NISP	MNI	NISP	MNI
Clothing	Metal	Button	5	5	6	6
	Metal	Eyelet	316	304	3	3
	Metal	Shoe Heel	84	48	2	2
	Metal	Shoe Tacks	2422	2422	0	0
	Metal	Shoe Base	0	0	4	1
	Metal	Suspender	13	9	2	2
	Metal	Hairpin	0	0	2	2
	Bone	Hairpin	0	0	1	1
	Metal	Pop Stud	5	5	2	2
	Cloth	Unidentified	0	0	3	1
	Cloth	Felt	1	1	0	0
	Leather	Sole	0	0	70	18
	Leather	Heel	0	0	4	4
	Leather	Lace Holes	0	0	59	1
	Leather	Shoe Fragment	0	0	152	1
	Mother of Pearl	Button	0	0	2	2
	Wood	Shoe Fragment	0	0	1	1
	Ceramic	Button	0	0	1	1
Total			2846	2794	314	48

**Table 5-6: Summary of Clothing**

	FPPG	Per Shoe	Estimate	FPTP	Per Shoe	Estimate
Eyelet	304	10	30.4	3	8	1
Shoe Heel	48	1	48	2	0	0
Shoe Tacks	2422	~100	~24	0	0	0
Sole	0	0	0	18	1	18
Heel	0	0	0	2	1	2
Overall Estimate	48			18		

**Table 5-7: Estimated Minimum Numbers of Shoes Based on Individual Elements**

FPPG had a poor level of preservation resulting in only the metal elements in the eyelets, shoe tacks and shoe heels remaining within the assemblage while a large amount of leather material including the soles of shoes were recovered from FPTP. In order to develop a rough estimation of the amount of shoes represented in each assemblage each element was compared to a shoe containing identical design elements found in Fremantle Prison’s curated material (Figure 5-13). Given the highly fragmentary nature of the leather remains, only shoe soles and heels were considered for analysis. Subsequent analysis estimated a minimum of 48 shoes (24 pairs for FPPG and 18 shoes (9 pairs) for FPTP.



Figure 5-13: Reference Shoe Curated at Fremantle Prison



Figure 5-14: Shoe Sole recovered from FPTP

A comparison of shoe size was also completed in order to indicate how the shoes recovered from FFTP compared to those recovered from FPPG; in particular the distribution of sizes was used as an indicator of children and women being present within the assemblage. Measurements were compiled by measuring the distance between the internal section of points of each heel, or the corresponding nail marks when measuring the leather soles. While the sample size was extremely varied with only 4 samples from FFTP and 48 samples from FPPG there is a clear bias towards larger sizes in the FPPG assemblage. The size of the smaller heels from FFTP indicate extremely small shoes likely those of children or women suggesting that these shoes at the least were obtained from a different source than those in FPPG.

Advertising analysis of 1864 indicate that shoes, specifically ladies and children's shoes as seen in FFTP were imported. There is no evidence to suggest that supplies for women and children were included within Commissariat requisitions from England and as such are likely sourced through local merchants. The shoes relating to FPPG by comparison are heavily standardised and given the approximate date of the assemblage likely relate to internal workshop industry production. The sourcing of raw materials required for shoe making such as leather and shoe tacks potentially could have been locally sourced owing to the presence of several tanneries and boot makers within the colony however conflicting information available in the West Australian through letters to the editor suggest both that local leather was unavailable or alternatively in large supply. (*The West Australian* 23/8/1900, p.6)

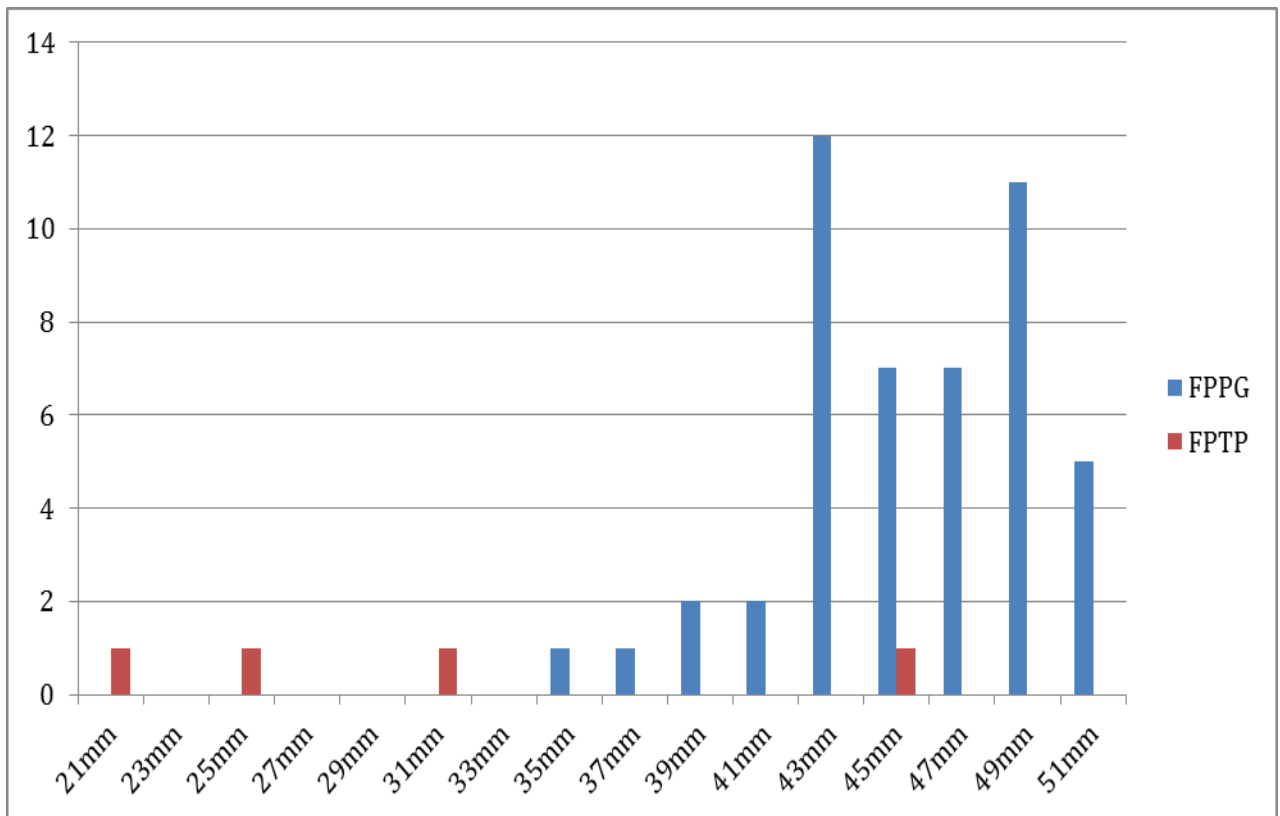


Figure 5-15: Size of Shoe Heels



Figure 5-16: Size Variation in Shoe Heels Illustrating Measurement Location

## Health and Hygiene/ Medicine

While Medicine represented a low proportion of artefacts in both assemblages; the artefacts recovered from FFTP contained a small concentration of medicine bottles and variety of hygiene implements including toothpaste, combs and a chamber pot. The complete lack of these items within FPPG and minimal fragments of medicinal glass despite the historical presence of medical treatment within Fremantle prison suggests that FPPG does not represent the medicinal aspects of the prison system given the presence of medical officers within the prison and the yearly provision for medicine indicated in the expected expenditure reports.

Domestic	Material	Artefact	FPPG		FFTP	
			NISP	MNI	NISP	MNI
Health/Hygiene	Glass	Poison Bottle	0	0	8	2
	Metal	Comb	0	0	3	1
	Bone	Comb	0	0	1	1
	Ceramic	Chamber Pot	0	0	1	1
	Ceramic	Toothpaste Container	0	0	1	1
Medicine	Glass	Medicine Bottle	8	3	36	7

**Table 5-8: Summary of Health and Hygiene Artefacts**

Within FFTP, 3 shards of medicinal glass contained the broad arrow symbol with one including the characteristic 'W.D' of the British War department. These bottles provide evidence of not only the use of imported medicines but the use of medicines provided and owned by the British government which subsequently bypassed the local merchant process. Jones and Smith (1985, p. 113) suggest that many bottles used within the military and associated services were identical to items used by the public and that it is only the identifying marks of military service that specifically identify a bottle as being provided by the British government.



**Figure 5-17: Medicine Bottle With Broad Arrow**

### 5.2.5 Subsistence

Evidence of subsistence was dominated throughout both assemblages by the remains of animal bones, with additional subsistence material found through the remains of food cans and condiment bottles.

#### Faunal Remains.

Mammal, bird and fish bone were recovered from both deposits with all faunal remains interpreted as being related to human consumption. While shell was found within both deposits it was not considered a subsistence material given the availability of shell material within the natural limestone deposit surrounding the prison and the decorative nature of the shells recovered. As the focus of the analysis was to determine both what type of meat was used by the penal system and what stage in the butchery process meat was procured analysis focused on the identification of species, bone element and butchery marks present. Butchery was analysed using British butchery techniques as suggested by Colley (2006, pg. 47) to be applicable to Australian historical sites. In particular attention was paid to butchery marks in addition to the primary quartering that is considered standard initial practice. Cut marks on long bones in areas of joint connection that would generally be avoided in

favour of a separation at the joint were considered evidence that the butcher was relatively unskilled (Colley 2006, p. 48).

The faunal remains from FPPG were significantly more fragmentary than the remains of FFTP potentially related to a burning process in situ as evidenced by the significant amount of charcoal found within the context. Over both assemblages 305 bones were identified to species and anatomical feature with 121 artefacts sided. Initial analysis highlighted the access of FFTP to a larger variety of faunal material as evidenced by the pig, bird and fish remains found within the assemblage (Figure 5.18). None of the historical documentation examined supported the tender or acquisition of fish or bird species within an administrative capacity. It is likely that these faunal remains were directly sourced from the local market allowing both the income provided through the production and selling of the carcasses to flow into the local economy.

Binomial Name	Common Name	NISP - FPPG	NISP- FFTP
Bos taurus	Cow	155	8
Ovis aries	Sheep	69	33
Sus	Pig	0	1
Aves	Bird	0	25
Fish	Fish	0	15

**Table 5-9: Summary of Faunal Remains Present**



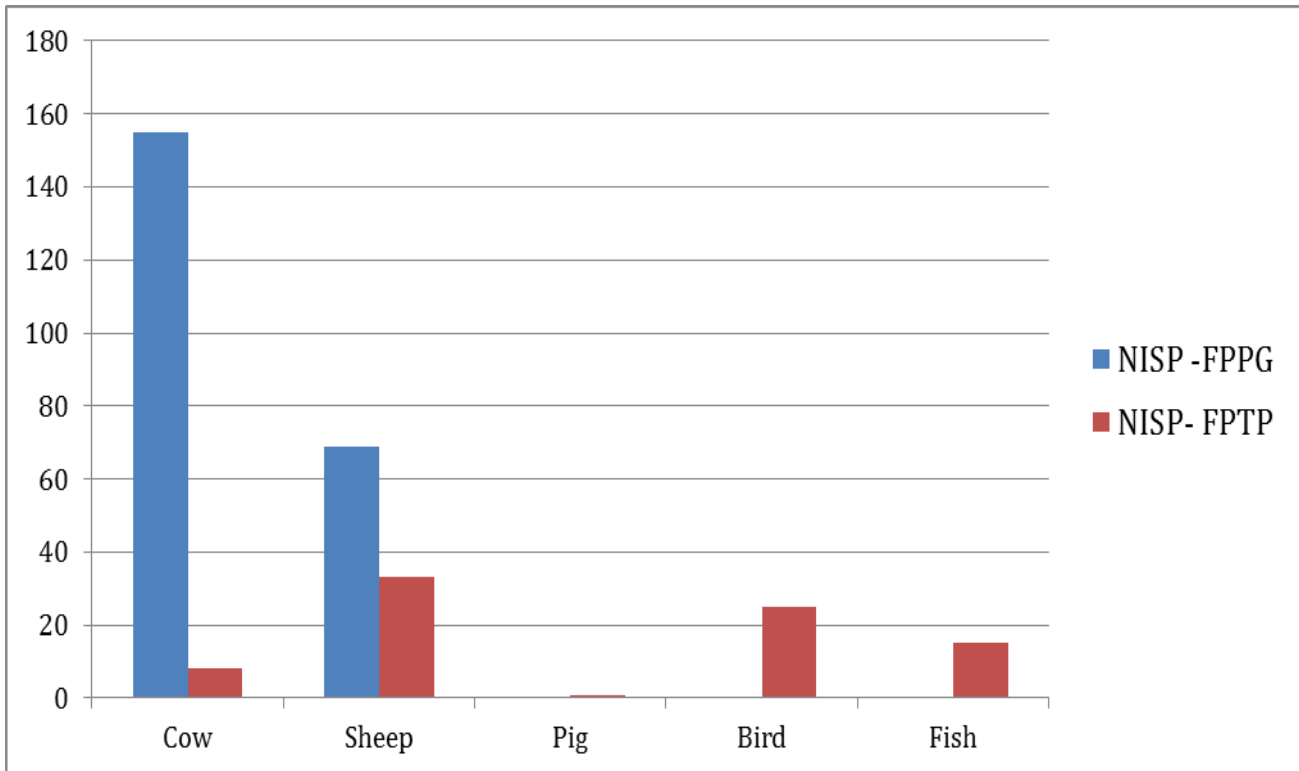


Figure 5-18: Illustration of NISP for Faunal Species at Each Site

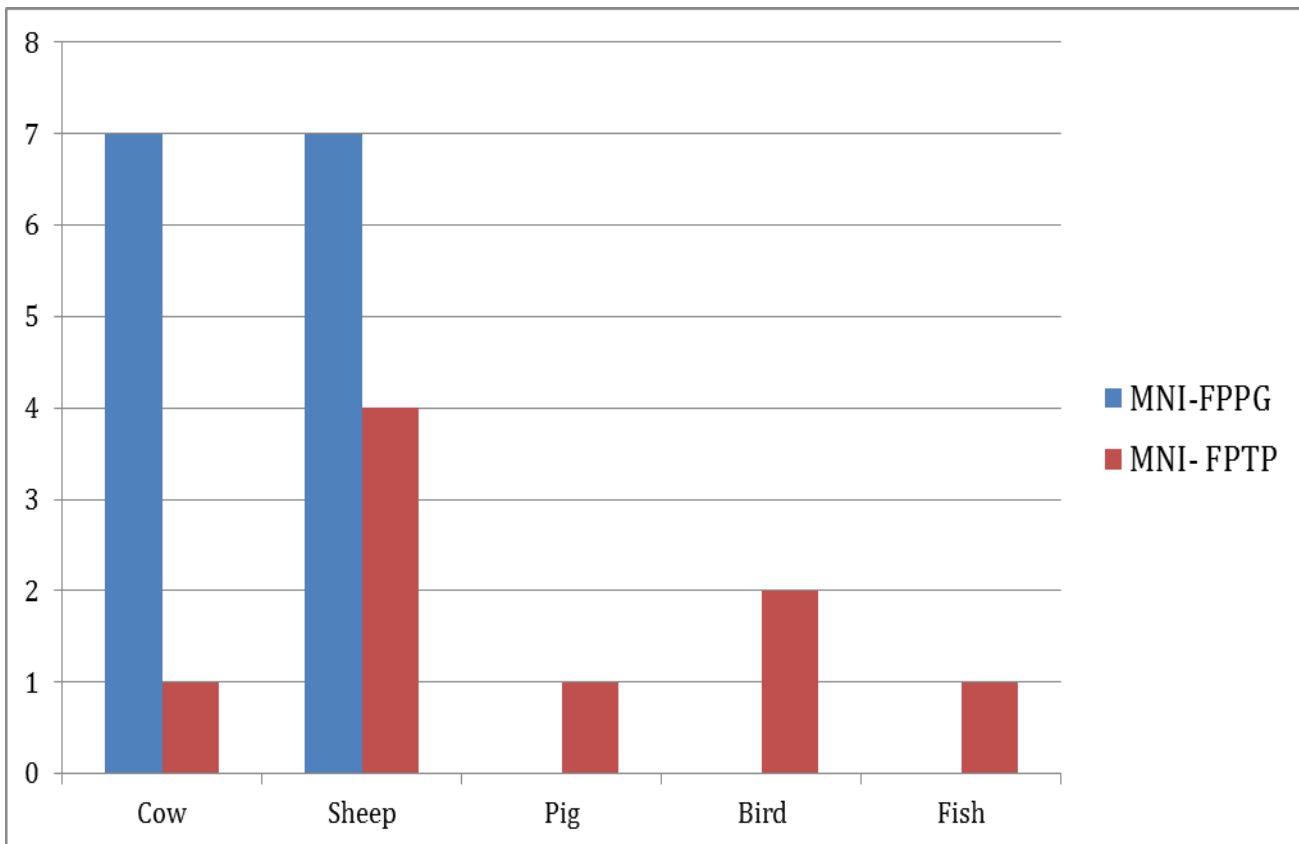


Figure 5-19: Illustration of MNI for Faunal Species at Each Site

## Mutton Consumption

While both sites had a large proportion of mutton within their faunal material there is a clear disparity between the two in terms of variety and proportions of faunal elements (Table 5-9). While the sheep bone recovered from FPPG represented 18 different elements including a variety of tarsal bones the material recovered from FFTP was made up of only 7 elements. These elements are easily understood in terms of specific butchery cuts, the majority of which are representative of leg roast cuts as seen in the recovery of the large proportion of femurs representing 39% of the sheep bone recovered from FFTP.

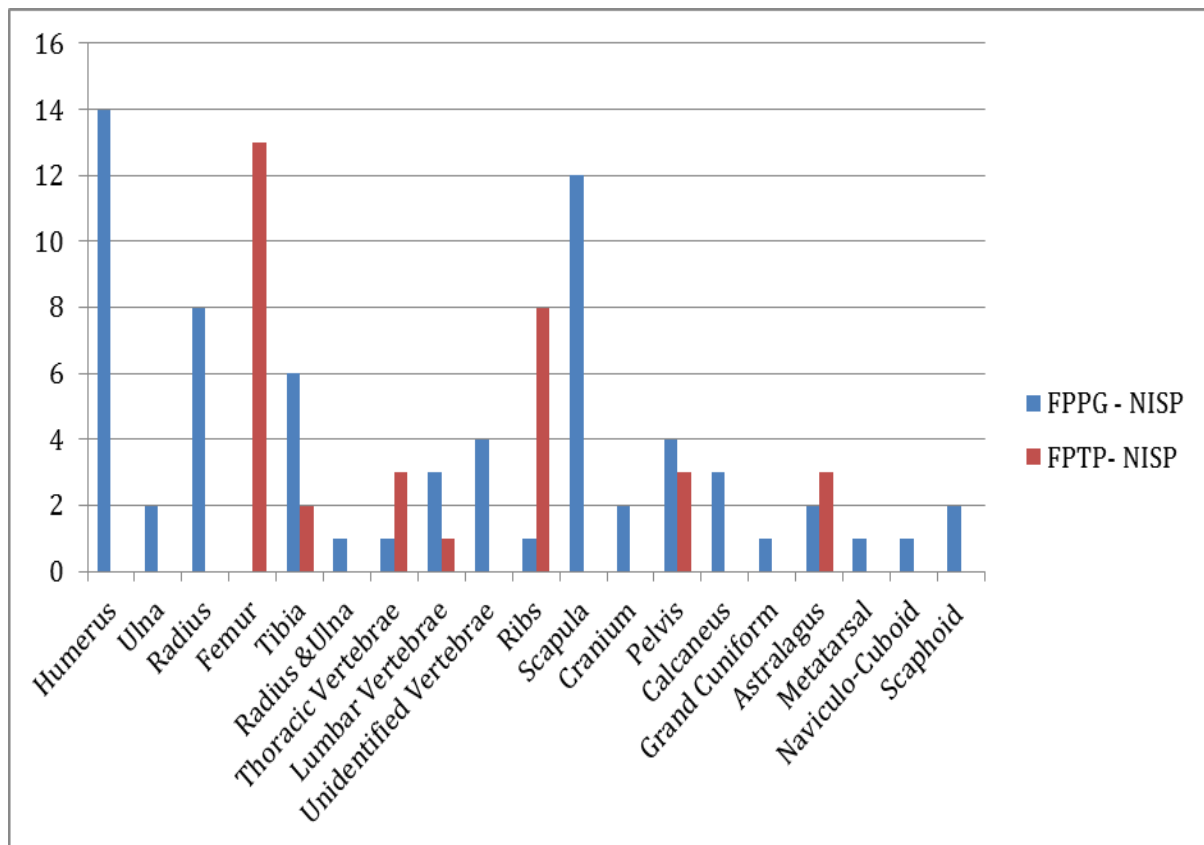


Figure 5-20: Type and Quantity of Faunal Element - Mutton

The variation is highlighted by diagrams 5-21 and 5-22 which both the variation in faunal element present is represented but also the relevant frequency of each element. The faunal remains from FPPG is indicative of mutton purchased as whole carcasses as shown through the approximately equal proportion of each quarter in addition to the tender requirement indicated in the 1870 tender requirements (The Perth Gazette 16/12/1870, p.3). While the absence of cervical vertebrae and metatarsals/metacarpals indicates that these elements were removed as part of initial butchery within the colony there is no evidence to suggest that mutton was quartered prior to entering the prison complex despite many of the vertebrae having central line butchery marks. These carcasses represent a minimum level of butchery prior to entering the prison and as such the economic value of the purchase lies largely in the value of the carcass itself as opposed to preparation costs.

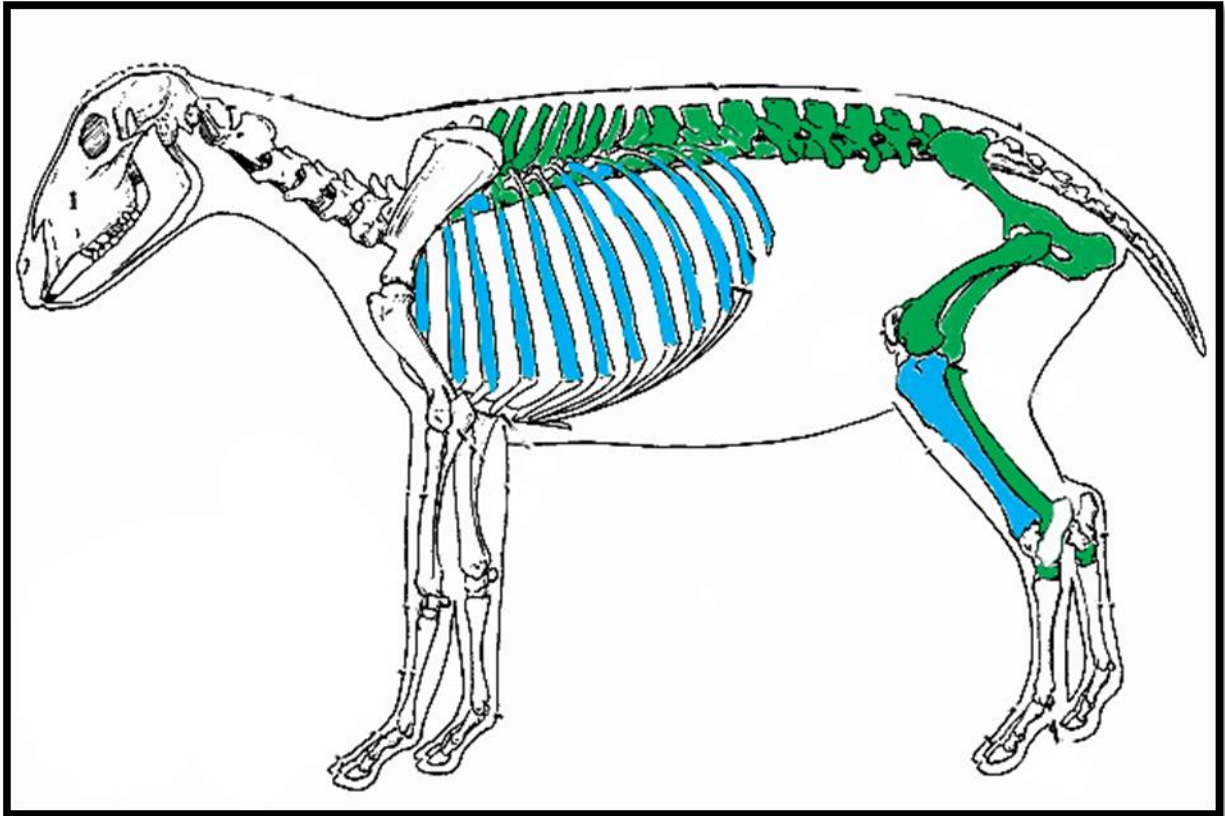


Figure 5-21: Skeletal Elements of Sheep Present at FPTP, (Green: Sided, Blue: Un-sided)

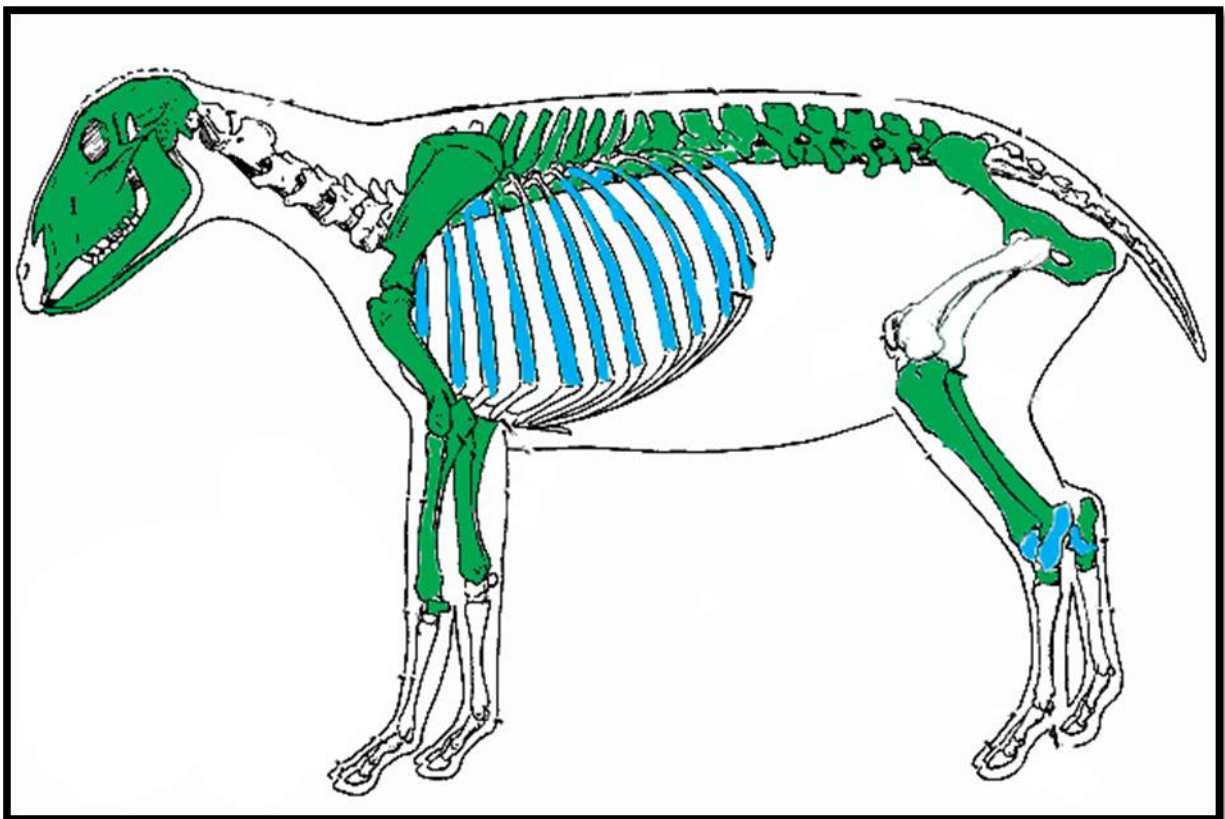


Figure 5-22: Skeletal Elements of Sheep Present at FPPG, (Green: Sided, Blue: Un-sided)

## Beef Consumption

As is seen with the mutton consumption within FFTP, faunal elements recovered from the assemblage represent specific individual cuts of meat. While 20 distinct elements are represented by faunal remains of FPPG (Figure 5-22) only 5 distinct elements are seen from the material recovered from FFTP (Figure 5-21). Conditions of tender reported in The Perth Gazette on the 16<sup>th</sup> December 1870 provide strict instructions regarding the supply of both Beef and Lamb to the convict system. While mutton was to be delivered by the carcass, Beef was required to be delivered in quarters, alternating between the hindquarters and forequarters. In addition military officers were given the option of drawing one pound of meat per family member from the suppliers per day provided they pay for the goods received. Given these instructions beef was separated into evidence of individual quarters of meat.

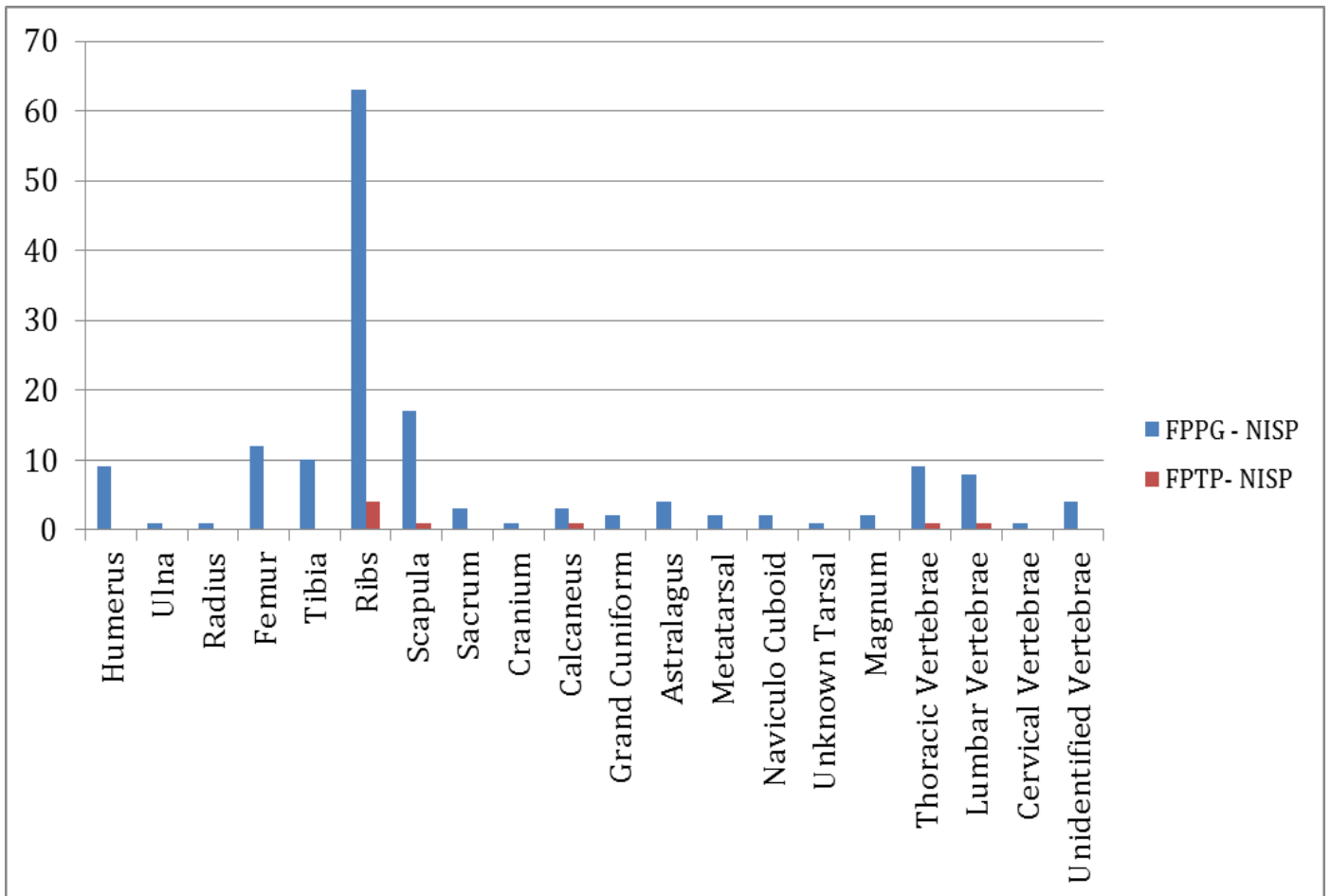


Figure 5-23: Type and Quantity of Faunal Element - Beef

Quarter	MNI
Left Forequarter	3
Right Forequarter	4
Left Hindquarter	7
Right Hindquarter	1

**Table 5-10: Minimum Number of Quarters Represented in FPPG - Beef**

This breakdown provides a strong indication that beef was provided to the colony in quarters given the strong disparity between left and right hindquarters while maintaining the proportion requirements of forequarters to hindquarters. The sourcing of beef as quarters indicates that preliminary butchery took place within the market while the reduction of the carcass to individual cuts was an internal process. Further evidence of this is provided by cut marks found on femoral heads that do not adhere to the standard butchery methods suggested by Colley (2006) which provide little benefit to the butcher. This internalisation of butchery removed part of the production process from the local market in turn reducing the economic value of the commodity by reducing the income that would derive from its purchase.

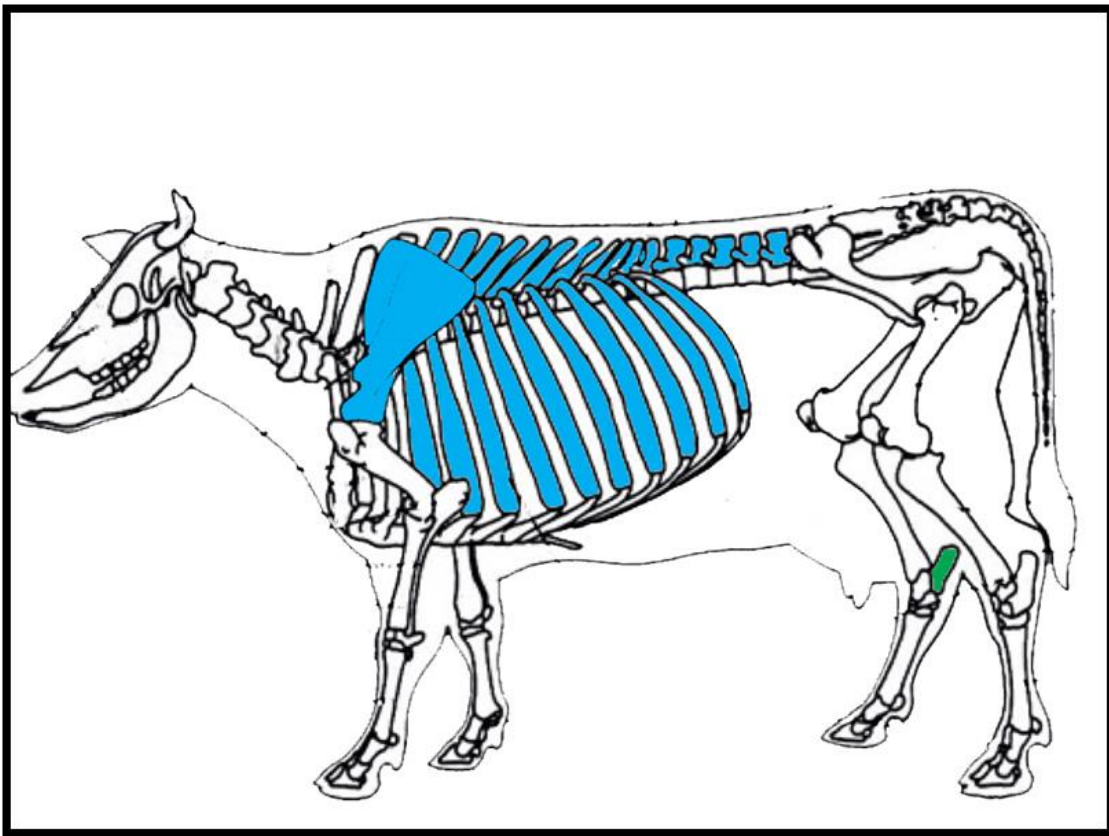


Figure 5-24: Skeletal Elements of Cow Present at FPTP, (Green: Sided, Blue: Un-sided)

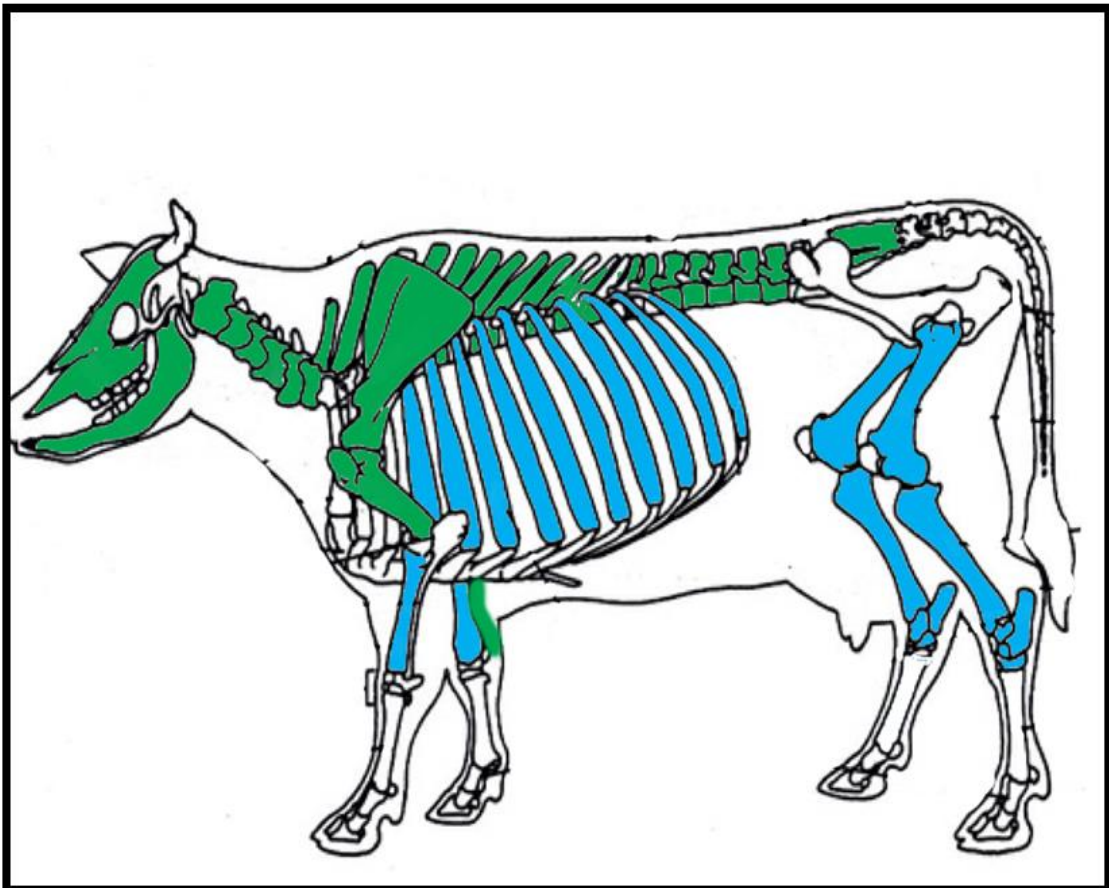


Figure 5-25: Skeletal Elements of Cow Present at FPPG, (Green: Sided, Blue: Un-sided)



### Condiments and Canned Food

Condiments were recognisable by their decorative design features and were often composed of green tinted glass. Chutney was identified based on the wide finish on the bottle. While the fragments identified as food cans were highly fragmented they were identified based on the curvature of the metal and thickness which matched several food cans available in the UWA reference collection. 47.4% of the subsistence related items recovered from FFTP related to food items in the form of condiments, chutneys and the remains of food cans. By comparison only 3.4% of the subsistence items recovered from FPPG related to condiments and canned food. These food items were generally sourced as imports and provided economic benefit primarily to merchant importers.

Subsistence	Material	Artefact	FPPG		FFTP	
			NISP	MNI	NISP	MNI
	Glass	Condiment	1	1	46	9
	Glass	Chutney	0	0	62	3
	Iron	Can	12	1	112	1

**Table 5-11: Summary of Non Faunal Subsistence Artefacts**



**Figure 5-26: Chutney Bottle - FFTP**



### 5.2.6 Indulgence

Artefacts relating to the indulgence class represent the most distinct variation between the two sites, representing only 0.1% of the assemblage at FPPG while representing 24.9% of the assemblage at FFTP. Items within this category were found to relate to a large variety of indulgence purchases including cosmetics, alcohol, tobacco, and gaming items. The largest category represented within this class related to alcohol bottles represented by a minimum vessel count of 37 bottles within the FFTP assemblage based on the sum of bottle finishes available within the assemblage.

Tobacco smoking was well represented within the assemblage of FFTP with 5 stem fragments and 9 bowl fragments recovered from the assemblage including 2 bowls identified as 'Ben Nevis Cutty' Pipes sourced from Scottish pipe producers and 2 pipes with the square and compass motif attributed to the freemasons. By comparison, FPPG contained only a single clay pipe stem within the assemblage. Given that tobacco was sourced directly from England as part of the rations provided to convicts until after the cessation of Transportation, it is likely that officers were also provided with both pipes and tobacco directly from the commissariat supplies. Given that the commissariat was the direct importer of both clay pipes and tobacco their consumption provides no benefit to the local economy.

The gaming items found within the assemblage provide strong evidence of the presence of children within the premises with multiple gaming items interpreted as children's dolls and toy sets. In addition to the children's toys a bottle of Kay's Cue cement used for snooker highlights the use of gaming material by a wider demographic within the household. These like the women's and children's shoes would have been sourced from merchant importers as opposed to through official commissariat channels.

Indulgence	Material	Artefact	FPPG		FPTP	
			NISP	MNV	NISP	MNV
Alcohol	Glass	Bottle	1	1	575	37
Tobacco	Ceramic	Clay pipe	1	1	14	8
Writing/ Reading	Slate	Slate Pencil	1	1	16	16
	Slate	Writing Slate	0	0	12	1
	Ceramic	Inkwell	0	0	1	1
Cosmetic/ Jewellery	Glass	Cosmetic Bottle	0	0	2	1
	Glass	Perfume Bottle	0	0	3	2
	Glass	Bead	0	0	6	6
	Ceramic	Bead	0	0	1	1
	Glass	Cosmetic Jar	0	0	2	1
Gaming	Glass	Game Bottle	0	0	1	1
	Glass	Marble	0	0	1	1
	Ceramics	Figurines	0	0	10	7
	Stone	Marble	0	0	6	6
	Bone	Whistle	0	0	3	1

**Table 5-12: Summary of Indulgence Artefacts**

### 5.2.7 Commodity Analysis

Following functional analysis, the artefact collection was further reduced to individual commodities based on interpretations discerned from the artefact and historical record. Prices for each commodity as well as additional information regarding the items status as a local produce item or import was subsequently sought using newspaper searches on trove. Prices were unavailable for a large majority of items with advertisers often citing possession of items as opposed to prices in advertising.

Table 5-13 represents a summary of the commodities found within FPTP and information gathered relating to their status as an import or local product based on data gathered from advertising in Western Australian newspapers from 1864 as well as prices relating to the wholesale purchase of these items. A large proportion of the commodities were unable to be traced to a price and instead were considered solely for their status as an export or colonial product. Table 5-13 lists the commodities within this collection from which price information could not be discerned.

Commodity	Varieties	Quantity	Production Process/ Sale Method	£	s.	d.
Alcohol	Ale	37	Imported, Sold per dozen	0	16	6
	Port			3	0	0
	Rum		Imported, Sold per gallon	1	0	0
	Gin			1	0	0
	Sherry			1	1	0
	Champagne			3	0	0
Mutton	Roast	12	Locally raised, slaughtered and butchered. Cuts potentially purchased under wider convict tender price, price per pound	0	0	5
	Ribs	8		0	0	4
Beef	Roast	1	Locally raised, slaughtered and butchered. Cuts potentially purchased under wider convict tender price, price per pound	0	0	5
	Chops	2		0	0	5
	Ribs	3		0	0	4
Condiment Bottle	Condiment	9	Imported, priced wholesale per dozen pints of salad oil	1	0	0
Chutney Bottle	Mustard	3	Imported, priced per dozen bottles various	0	12	0
	Pickle			0	15	6

**Table 5-13: Summary of Commodities with Price Information - FPTP**

Material	Commodity	Quantity	Local/ Import
Metal	Metal Button	6	Single buttons not advertised, Local tailoring of imported material available as well as imported clothing
Leather	Shoes	9 pairs	Boots both imported and available through local producers
Metal	Metal Suspender	2	Imported
Metal	Hairpin	2	No Advertising records
Bone	Hairpin	1	No Advertising records
Metal	Pop Stud	2	Buttons alone not advertised, Local tailoring of imported material available as well as imported clothing
Mother of Pearl	Button	2	
Ceramic	Button	1	
	Oil Lamp	1	Imported
Glass	Poison Bottle	2	Imported
Metal	Metal Comb	1	Imported
Bone	BoneComb	1	Imported
Ceramic	Chamber Pot	1	Imported
Ceramic	Toothpaste Container	1	John, Cosnell and Co, London Imported, No Advertising Record
Glass	Serving Dish	3	Imported, Merchants selling from London and Melbourne in addition to Local Merchants
Glass	Drinking Glass	5	
Metal	Fork	2	
Metal	Dessert Spoon	2	Imported or directly sourced from convict ships/ Commissariat
Metal	Tea Spoon	1	
Metal	Bowl	1	Imported, Merchants selling from London

Bone	Knife	1	and Melbourne in addition to Local Merchants
Ceramic	Plate	14	
Ceramic	Bowl	8	
Ceramic	Cup	3	
Ceramic	Egg Cup	5	
Ceramic	Jug	3	
Ceramic	Container	5	
Ceramic	Saucer	1	
Ceramic	Teacup	6	
Ceramic	Baking Dish	1	
Ceramic	Serving Dish	3	
Ceramic	Lid	1	
Ceramic	Clay pipe	8	Imported, Ben Nevis pipes Scottish, Likely directly sourced from Commissariat
Slate	Slate Pencil	16	Imported
Slate	Writing Slate	1	Imported
Ceramic	Inkwell	1	Imported
Glass	Cosmetic Bottle	1	Imported
Glass	Perfume Bottle	2	Imported
Glass	Bead	6	Imported
Ceramic	Bead	1	
Glass	Cosmetic Jar	1	Imported
Glass	Game Bottle	1	Imported from London
Glass	Marble	1	Imported and sold by local merchants
Ceramics	Figurines	7	
Stone	Stone Marble	6	
Bone	Whistle	1	Unknown

Glass	Medicine Bottle	7	Broad arrow marked bottles property of British Navy, directly sourced, No local market involvement
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**Table 5-14: Summary of Commodities - FPPG**

Both tables highlight that the majority of items represented within the FPTP assemblage represent imports with only 15% of the goods having evidence of a potentially local source within either the artefacts diagnostic features or through advertising.

Advertising was considered from the year 1900 in relation to the material from FPPG. Commodities were once again compared to advertising however the development of the local market had shifted advertising to focus on information about specific products and specialist services. Given the significantly larger connection level between Western Australia and global markets goods were no longer specifically advertised as local or colonial. Similarly prices quoted in newspapers often referred to the outcome of trade with international markets as opposed to local merchants who instead focused on distinguishing their goods from their peers

Commodity	Varieties	Quantity	Production Process/ Sale Method	£	s.	d.
Metal Buttons	na	1	Local and imported clothing available, Imported fabrics			
Metal Button - Best Ring Edge	na	3				
Metal Button- Condit & Launder Perth	na	1	Local tailor using imported fabrics			
Pop Studs	na	5	Local and imported clothing available			
Suspenders	na	9				
Boots	na	24 pairs	Local and Imported boots available, possibly made internally			
Ceramic Plate	na	1	Unknown			
Oil Lamp	na	1	Imported			
Alcohol Bottle	na	1	Imported			
Clay Pipe	na	1	Imported			
Slate Pencil	na	1	Local slate mine, imports also available			
Medicine Bottle	na	3	Imported			
Quarters of Beef	Mutton	15	Local production sold per pound			5.2
	Lamb					7
Mutton full carcass	Beef	7	Local production sold per pound			5
	Veal					

**Table 5-15: Summary of Commodities Without Price Information - FPTP**



This chapter has analysed two scales of information in relation to the penal system highlighting the various types of information available and limitations provided through both scales. The analysis of FPPG and FPTP has provided a large level of comparative information in relation to the penal system and highlighted the variation between institutional spending and wage based purchases while also highlighting the importance of comparative information in relation to the production capabilities of the colony.

## 6. DISCUSSION

When Pamela Statham analysed the colonial attitudes toward the introduction of convicts in WA (1981a) she acknowledged that the various types of economic agent, from merchant to artisan to agriculturalist, could have received benefits from the introduction of the convicts relevant to their industry. This study's analysis followed that line of reasoning by introducing the economically based concepts of staple theory and the circular flow model in order to trace the purchases made by the penal system, showing increased income for those who the commodities were bought from.

Staple theory provided the mechanism for understanding the impact of the penal system in terms of how the introduction of the convicts increased production within the local market, both from increasing the demand for goods as well as being used to increase production capacity, which would have prompted economic growth. The development of industries and products that used the convict force as an input (a forward linkage under staple theory) has been thoroughly considered in other archaeological research; For example, Bush's (2012) analysis of building developments related to construction completed by ticket of leave men, and Winter's research (2013a) highlighting the value of the regional labour force. This research on the other hand, considered the development of industries that provided goods for use by the

convict system, and highlighted the value of tracking the flow of funds from the British to the colony when determining the transformative effect of the convict system.

This study hypothesised that specific local industries would represent large proportions of the expenditure of the penal system and subsequently be the mechanism through which the British capital entered the economy.

## 6.1 Research Questions:

### 6.1.1 At what point in the production cycle were materials sourced from the WA Economy? How does this vary in the convict and post-convict period?

The methodology posed as part of the theoretical basis of this study separated the production cycle simply into raw material procurement, manufacturing, and merchant on selling, with each stage of the production process benefiting specific industries. While both FPPG and FFTP represented significantly different patterns of spending, both impacted the economy in similar ways. FPPG, given the later time period and more developed market had a larger variety of material that had the potential to be sourced locally. Despite the significant time difference between the two sites meat was the only item within the assemblages in which the entire production process was local, in such providing full benefit of the expenditure to the local economy. The presence of unusual butchery marks was interpreted as evidence that the meat within FPPG was butchered to a further degree within the prison by comparatively unskilled butchers when compared to the remains as seen in FFTP. The lower level of butchery is indicative of the internalisation of parts of the production process undertaken within the colony and subsequently less spending based on the lower level of work required.

The largest difference in sourcing between the convict and post-convict period relates to a complete bypass of the local market by the penal system during the convict period. There is significant evidence provided through historical documents to suggest that the local market was unable, or unwilling, to provide certain goods at the required standard throughout the convict period, likely a contributing factor in the decision for some goods to be sourced directly from England. This was first seen in 1850 when the colony failed to submit any tenders for flour in response to advertising, and also seen in relation to the purchase of clothing and shoes, which were reported to be available within the colony at an advance of 30-40% of English prices or alternatively available at an inferior quality (Young 1988, p. 81) This phenomenon is seen in a multitude of artefacts and historical documents including evidence of the direct sourcing of tobacco, medicines, and clothing, as well as the salvage of commodities from convict ships. This process ceased when Transportation ended. Subsequently a larger variety of commodities including the aforementioned tobacco were tendered to the colony, while simultaneously the tender for raw material used in boot making, and the tender for base fabrics, indicate the intention to internalise some of the manufacturing processes to reduce costs.

In the convict period the majority of items requiring manufacturing that were not directly imported by the convict system were manufactured internationally and advertised as complete products. This is evidenced by newspaper advertising that identified which materials were locally produced and which were imported, and noting specifically which ship the cargo for sale had come from. These commodities only include the merchant on selling within the local market and as such a large proportion of the cost of the item would have been leaked out of the economy. Winter (2013a) in his analysis of convict depots also found a variety of imported goods used to improve the health and diet of the convicts. These items would have provided a larger proportion of benefit to the local economy given the increased cost of transporting the commodities to the regional areas.

By the post-convict period the local market had developed significantly, as evidenced by the diversification of advertising which ceased to acknowledge the origin of the commodity, seen in the advertising sampled in relation to the goods of FPPG. While the diversification in advertising shows the development of Western Australia in respect to international trade and the availabilities of the local market, analysis of commodities in terms of production became difficult given the multiple locations goods could potentially have originated from. The exception to this was seen in the textile and boot making industries which had developed local manufacturing industries; however fabric was still an imported commodity as indicated by the absence of textile companies in the 1898 statistical register. In addition, clothing was still imported fully made making the identification of production based on generic clothing items difficult. One of the buttons from FPPG is embossed with Condit and Lander, a local tailoring business suggesting that at least some of the production of clothing within the prisoner population had been sourced through local tailors. Given that the fabric to construct the clothing was imported a portion of the value of commodities was leaked out of the economy however the benefit attached to the manufacture and sale of the items was injected in to the local market.

### 6.1.2 What does the material and documentary record tell us about the impact of the penal system on the colonial WA Economy between 1850 and 1900?

The material and documentary record highlights the extremely varied nature of expenditure seen in the WA penal system. The macro analysis of the convict system undertaken through the analysis of tenders and the British Parliamentary papers highlight a system in which a large variety of tasks were supported by British funds. This funding breakdown developed and changed over the lifespan of the convict system and subsequent transition to closed penal system. The convict system went through stages of development which have been acknowledged by authors such as Winter (2013a) and were reflected in the changing tender methods over time. Initially as the convict system established itself, tenders were regular and generally requested small groupings

of goods focusing on the short term needs of the system with commodities relating largely to rations and building requirements. By 1860 the system had stabilised as indicated by tender advertisements that didn't list their requirements suggesting that both the colony and the convict system clearly understood what type of goods were regularly required. After Transportation ended in 1868 the convict system was beginning to scale back operations, however the system began to diversify the goods that were requested of the local market, likely due to the cessation of directly imported goods that were transported on convict ships. This is seen in the tender for tobacco and crockery which had not been tendered for prior to 1870. This movement towards local producers reflects not only the increased ability of the local market, but also the reduction of direct trade ties with England maintained as part of the penal system. Instead the system had begun to shift to a locally supplied process which would continue with the transition to colonial control. In addition at this time early indications of the internalisation of some production was beginning to be seen through the tender for boot making material and fabric.

The development and reduction in scale of the penal system over time is also highlighted in the breakdown of spending, with the expenditure on wages and the police and magistrates increasing over time until 1870, while provisions for rations and building and works peaked in 1854 and was subsequently reduced. While analysis post-1870 was not available within the British Parliamentary Papers the severe reduction of administrative staff within the penal system in the 1870's as noted in Edgar (2014, p.150) highlights the continued reduction in administrative power of the penal system. While in 1870, the convict system maintained a staff of 150 people, by 1875 that number had shrunk to 51 staff members. This highlights the transition of the penal system from a colonial-wide administrative body in the convict period to a localised system based in Fremantle that was responsible only for the prison system, which is also seen in this study through the brief comparison of Convict Finance Records.

Bavin's (1994, pg 414) analysis of faunal material found within the prison grounds highlighted the increasing proportion of cattle and fowl bone over time, she interpreted as a response to changing rehabilitation techniques at the beginning of the 20<sup>th</sup> century.. While the Parade Ground assemblage in this study also highlighted the large proportion of bone dated to the beginning of the 20<sup>th</sup> century, specific reference requesting beef within meat supplies dated back to 1970, suggesting the diversification of meat began earlier than Bavin suggested. These guidelines reported in the (*The Perth Gazette*, 16/12/1870) in 1870 required the proportion of meat supplied to be 4:3 in favour of beef as opposed to mutton, with beef carcasses to be sold as quarters in equal quantities between forequarter and hindquarter. The analysis of FPPG, conforms to this requirement, the specificity of which was used as evidence of potential secondary uses of the beef carcasses.

This study interpreted the introduction of beef as an attempt to internalise production processes and gain larger efficiency from the purchases based on the possible use of the tallow for candles and soap. By introducing the beef which retailed locally at approximately the same price per pound as mutton the prison would have reduced costs by using prison labour to create products that otherwise would have been purchased from the local economy. The internalisation of boot making is largely supported throughout the historical record, both in the tender for shoe resin and leather seen in 1875 and the re-establishment of boot making as an internal workshop industry by 1901(Thomas and Stewart 1978), by comparison evidence of candle making is comparatively limited. Tallow candle moulds were tendered for in 1850 and faunal assemblage of cattle bones seen in FPPG consists largely of extremely fragmented and burnt long bones in comparison to the corresponding tarsal and rib collection. This signature closely matches remains of the tallow rendering process used in candle making (Pavao-Zuckerman 2011), however this possibility would have to be examined further. By internalising the boot making process and purchasing cattle with only basic butchering the penal system was

removing possible sources of income from the local economy and subsequently reducing its impact on suppliers.

### 6.1.3 How did the material demanded by the penal system vary between institutional and private (wage based) consumption?

Significant difference was seen between the assemblage considered institutional (FPPG) and that of the wage based consumption at No 14 (FPTP). While the institutional assemblage undoubtedly represented only a portion of the commodities consumed through the institutional process there was a distinct lack of indulgence or status based items seen in the assemblage when compared to FPTP. The comparison of the assemblage must consider the distinct sampling bias present, and the representativeness of each assemblage of the range of commodities used by each consumer. Given the distinctive differences seen in both preservation and type of consumption indicated, analysis can only be considered as indicative of the types of consumption seen by the two as opposed to the full picture.

For the wage based purchases, the high proportion of indulgence purchases reflects the purchase of goods outside of the production capability of the colony which was largely restricted to agricultural pursuits at the time. Subsequently a large proportion of the commodities represented within this assemblage were imported materials which as previously discussed provide benefit to the colony only in relation to merchant's profit margin. Imported material within the privy artefact assemblage was sourced solely from the United Kingdom despite the local market having access to goods from a variety of locations. The choice to source commodities that were both from Britain and represented British consumption patterns and rituals indicates the importance of maintaining a level of British identity within the new colony as evidenced by the adherence to English dining and hygiene rituals.



The items that were sourced locally were largely represented by the faunal remains and represented individual cuts of meat, in which there is no evidence of unrefined butchery techniques, unlike those seen in FPPG. This suggested that meat was sourced as individual cuts from the market resulting in the entire production process being local. In this case while the assemblage represents an influential and wealthy wage earner within the colony, through the artefact analysis it is clear that a significant proportion of income spent on these purchases would have left the colony based on the high level of imports. In comparison, the institutional assemblage has evidence of clothing made locally in the button from Condit and Launder as well as the vast assemblage of faunal remains which remained a local purchase throughout the entire study period. The lack of domestic consumption items within the assemblage suggest that the assemblage provides a biased sample of prisoner consumption, with the strong possibility of other aspects of a prisoners access to commodities being deposited elsewhere. Winter (2013a, p.) has suggested that prisoners ate off metal plates which potentially are represented in part by the undiagnostic metal within my assemblage, adding an additional preservation bias to the analysis. Given the standardisation of size and construction seen in the heels recovered from the institutional assemblage as well as the single eyelet found that was still in its 'blank' pre used state it is likely that these fragments represented boots constructed within the prison as opposed to through local dealers, highlighting the internalisation of production processes that were once again beginning to develop by 1900.

The analysis has highlighted that both the agriculturalists and merchants benefited significantly from the penal system. While in economic terms the purchase of imported goods in comparison to commodities produced entirely in the colony injected limited capital into the local market, the growing demand for imported material would have led to the growth of the transport network. In turn this would have allowed developing industries to have wider access to international markets which represents a significant linkage effect of the penal system. Local industries were largely restricted initially to those for basic

consumables, predominantly meat, vegetables and flour of which the colony was not always able to fill locally. Over time the market grew and by the cessation of Transportation it had developed to a level in which it could support a larger variety of commodities. This development was driven by the increased population which enabled infant industries to become viable, maintained by a large import sector; however by this point the penal system was attempting to internalise parts of its commodity requirement reducing the benefit to the local economy. The study has highlighted that different portions of the penal system, at different times, provided benefits to a variety of industries throughout the purchases they made. There is significant potential to continue this research with a wider range of sites in order to develop a more comprehensive analysis of how capital entered the economy based on the convict system and the specific aspects of that system that was provided with funds.

## 7. CONCLUSION

This study set out to test the feasibility of using archaeological and documentary evidence to examine the penal system from an economic viewpoint using concepts developed in staple theory and the circular flow model. This chapter assesses the results of this pilot study in relation to existing literature concerning the transformative effect of the convict system in WA and the potential of artefacts to inform on global trade networks. In addition this chapter will highlight the limitations of this study and assess the potential value of extending the scope of this line of analysis.

The analysis has highlighted the importance of imported and local commodities to the penal system: both as part of the official administrative requirements; and to the staff whose earnings were spent on a variety of industries. The demand created through these avenues provided an effective method for transmitting capital to the local market, as well as creating an increased demand for trade networks between England and Western Australia.

Orser (1994a) highlights the connection of artefacts and sites to long range trade networks and the flow of specific types of commodities. In turn, the types of commodities imported are indicative of the values of those who purchase them and the relationship between the local society and the society through

which imports are sourced. The capacity of the colony to access global markets was significantly limited prior to the convict period given its isolation and small size. The introduction of the convict system and subsequent population growth enabled WA to be integrated into the global trade network largely through the increased demand for imports (Staniforth 2003). This study highlights the significant institution-based connection of the penal system to English merchants during the initial stages of the convict system, which can be seen through the bypass of the local market when sourcing tobacco, clothes, and medicines. This connection has been shown to wane over time in favour of the internalisation of aspects of the production process and the increased variety of commodities sourced directly from the local market.

The material sourced by wage earners indicates that imports allowed for the maintenance of social customs, including hygiene and dining rituals, which would not have been possible given local production at the time. Over the convict period the availability of imports in the local market transitioned from an economy primarily based around the import of basic speculative cargoes to an economy highly interconnected with overseas markets. The increase in population caused by the convict system, and in particular the proportion of funds that was cycled through merchant importers, provided the necessary base to develop the import industry. By 1900 the market had evolved to include a large variety of merchants specialising in specific produce that was no longer hampered by the need to wait extended periods of time for transport.

Locally the convict system transformed multiple aspects of the colony both through the injection of labour (Bush 2012; Winter 2013a) and through the development of much needed public infrastructure (Gibbs 2001, 2006, 2007). Local industries, particularly those related to agriculture and construction, were provided with an increased demand for their goods allowing the development of those industries. Over time the local market developed the ability to source a larger variety of commodities, based on increased shipping networks (Winter 2013b) and the maintenance of the demand for a wider range of goods partially

motivated by the supply of the convict system. This study falls in line with these recent interpretations which focus on the transformation caused by the penal system, as opposed to analysing the system based on positive or negative dichotomy, and shows the variety of methods through which crown capital entered the local economy.

### 7.1 Limitations:

The analysis highlighted several limitations that must be considered should this study progress further. The analysis of the convict and post-convict periods provided unique limitations due to the changing nature of the documentary evidence and subsequent lack of clarity regarding the production capabilities of the market. The documentary record relating to convict spending until 1870 is relatively comprehensive: the lack of availability of annual reports following the transition from the convict period to colonial control results in minimal standardised information regarding penal system expenditure. While some official documentation relating to the post-convict period is available from the state records office, the lack of cataloguing and consistency made it unviable to consider these documents within the scope of this analysis.

The ability to accurately trace artefacts to specific commodities also presented a limitation on the analysis. This restricted the study on two levels: primarily the high level of fragmentation, especially in relation to the materials recovered from FPPG, resulted in a limited ability to identify diagnostic characteristics that would aid in positive identification. Secondly once identified, some items had the potential to represent several different commodities with significantly different prices and production methodologies; this undermined the ability to trace the commodities to their manufacture location.

Changing trends in newspaper advertising in the post-convict period, particularly in the aftermath of the gold rush, also limited the available information on production methodologies. While newspaper advertisements sampled from 1864 commonly acknowledged whether goods originated locally

or as an import, by 1900 advertising had shifted in not only the amount of merchants advertising, but also the way that their goods were advertised based on item quality. The interconnectedness of trade between the colony and international ports made it difficult to determine whether items were imports or locally produced given that by 1900 many items potentially could have been made from either source. Subsequently, future research using this methodology must focus on time periods in which there is significant potential to match commodities to manufacturing location based on the technological production possibilities of the local colony.

## 7.2 Potential for future research:

While there are several limitations within the analysis, this study has shown the potential variation in the economic impact of the penal system both through the macro- and micro-analysis. Should highly diagnostic and securely dated artefact collections become available relating to the WA convict system this methodology has the potential to be used as a way of understanding the extent and variability seen in the convict system and its subsequent transformative effect on the local economy.

While only two artefact assemblages were able to be targeted by this analysis, this study has highlighted the potential of using the archaeological record in reference to understanding the impact of the convict system on both the local market and international trade networks. An expansion of the current methodology to include a wide range of artefact collections relating to various time periods, spatial areas, and levels of agency would allow the development of a much finer-grained understanding of the mechanisms through which British capital entered the Western Australian market, and ultimately of how the introduction of the convicts transformed the local economy.

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## APPENDIX 2 – Breakdown of Tenders

Date of Tender		Date of Tender																		
		Q	T	Q	T	T	T	T	T	Q	Q	T	Q	T	T	Q	T	Q	Q	
Subsistence	Meat		1		1		1										1	1	1	
	Grains											1								
	Dairy																			
	Fruit/Vegetables																			
	Condiments/Seasoning																			
	Other																			
	Alcohol																			
	Smoking																			
	Indulgence	Metal																		
		Nails																		
Bricks			1																	
Timber																				
Other			1																	
Structural	Lighting/Heating -Fuel																			
	Lighting/ Heating - Other																			
	Hygiene																			
	Clothing																			
	Bedding																			
	Serving Dishes/ Cutlery																			
	Fabric																			
	Other																			
	Live Stock																			
	Machinery/ Tools																			
Industrial	Construction																			
	Subsistence																			
	Washing Clothes																			
	Cleaning																			
Labour Services	Cleaning																			
	Transport																			
Other																				

Date of Tender		Type of Tender																																						
		Q	Q	T	T	T	T	T	T	T	T	T	T																											
Subsistence	Meat	13/1/1865	20/1/1865	27/1/1865	3/2/1865	10/2/1865	17/2/1865	24/2/1865	24/2/1865	9/6/1865	8/9/1865	7/1/1870	14/1/1870	21/1/1870	28/1/1870	4/2/1870	11/2/1870	18/2/1870	2/9/1870	9/9/1870	16/12/1870	15/1/1875	29/1/1875	27/4/1875	7/5/1875	11/5/1875	14/5/1875	18/5/1875	16/7/1875	30/7/1875	20/8/1875	15/10/1875	22/10/1875	11/2/1880						
	Grains			1	1	1	1	1				1	1	1	1	1	1	1	1	1	2																			
	Dairy																					4																		
	Fruit/Vegetables																					4																		
	Condiments/Seasoning	1	1																			7																		
	Other																																							
	Alcohol																					3																		
	Smoking																					2																		
	Indulgence	Metal																																						
		Nails																																						
Bricks																																								
Timber		1	1									1																												
Other																																								
Lighting/Heating - Fuel																						3																		
Domestic	Lighting/ Heating - Other																				2																			
	Hygiene																				1																			
	Clothing	8	8																																					
	Bedding	3	3																																					
	Serving Dishes/ Cutlery																																							
	Fabric	4	4																																					
	Other	1	1																			3																		
	Live Stock																																							
	Mechanical	Machinery/ Tools																																						
		Construction																					1																	
Subsistence																																								
Washing Clothes																																								
Labour Services	Cleaning																																							
	Clothes																																							
	Transport																					1																		
Other																																								

Legend - Appendix 2	
Q	Quantity Tender Tendered for specific quantity of goods
T	Time Based Tender Tendered for time based contract
O	Open Tender Tender advised interested parties to contact convict service
	Fully produced commodity Tendered fully provided to final production stage
	Raw/ Early Production Stage Commodity Tendered for item in early production stage indicating additional production required
	Colonial Commodity Tendered for colonial version of good

### APPENDIX 3 – Convict Finance Board Salary Figures

	1870	£	%	%
Executive Administration	Executive Administration	453	26.7	26.7
Fremantle/Perth	Fremantle/ Perth	590	34.8	34.8
Regions	Guildford	139	8.2	
	Eastern District	195	11.5	
	Albany	71	4.2	
	Northern and Southern District	249	14.7	38.5
	1898	£	%	%
Executive Administration	Executive Administration	28	4.1	4.1
Fremantle/Perth	Fremantle/Perth	646	93.6	93.6
Regional	Bunbury	4	0.6	
	Vasse	4	0.6	
	Newcastle	4	0.6	
	York	4	0.6	2.3

### APPENDIX 4 – Summary of Convict Expenditure – Report 1870

	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860
Military	10760	13276	39961	42107	53124	35286	31126	34126	48629	34007	33077
Convict	4497	34103	45024	52665	76537	77874	61645	57196	51081	53871	48014
Civil Servi	6800	6960	7372	8230	2936	2037	167	0	7435	4195	440
Total	22153	56339	56339	103002	132597	111697	93477	101322	108045	92072	81551
	1861	1862	1863	1864	1865	1866	1867	1868	1869	1870	
Military	32113	28525	29464	31573	31573	32100	32269	37427	33880	31436	
Convict	49481	49481	69019	72215	80420	70380	80232	78201	71064	67809	
Civil Servi	860	860	337	495	415	668	408	1010	2080	2585	
Total	78866	78866	108849	104110	112247	114209	114209	116668	107024	101800	



## APPENDIX 5 – Penal System Expenditure Records

	E-1852	E-1854	E-1856	E-1857	A-1858	A-1859	E-1860	C-1861	A-1862	A-1863	E-1864	C=1868	C=1870
Salaries and Allowances -Superintendence			13926	15300	13980	11964	9863	10329	10789	11193	13911	18313	
Salaries and Allowances -Religious Instruction			1138	1500	1827	2258	2386	2126	2617	2727	2727	3235	
Salaries and Allowances -Medical Treatment	8600	11481	1053	1300	1137	1257	1267	1255	1355	1506	1681	2336	19697
Provisions	18500	40127	33209	30000	31565	24930	16492	14321	14812	17786	19633	28420	24550
Transport of Provisions	6500	3714	2934	2000	2058	1845	1569	1646	1565	1769	3606	1449	1453
Medicines	0	0	0	0	87	100	100	0	125	100	100	10	1
Fuel and Light	700	2883	1888	1800	2243	1650	1290	831	1000	900	950	2824	2375
Clothing, Bedding and Prison Stores	0	2000	1000	1200	4913	400	3000	303	834	2506	8365	0	55
Works, Building and Stores	13600	15154	5983	8500	8831	3149	4160	2593	3659	5313	5313	1921	202
Miscellaneous	2000	4403	1768	1526	1526	1626	1553	1323	1836	1216	1020	0	1362
Gratuities to Convicts	7000	4434	3448	934	972	650	1740	1990	1000	1000	2880	1300	650
Police and Magistrates	5700	8056	9021	8340	8354	9585	10621	10487	10893	11302	12117	19634	16720
Total	57400	92217	75408	72400	77493	57466	54041	47209	50117	57318	72303	78580	67073