Contributions To Global Historical Archaeology

Gaye Nayton

The Archaeology of Market Capitalism

A Western Australian Perspective

Springer

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Gaye Nayton
64 Weston Street, Maddington,
Perth, Western Australia,
Australia 6109
reachnayton@optusnet.com.au

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To Mum
Sorry it took too long

Acknowledgment

The following book arises out of research for my doctoral dissertation started at Cossack in 1989 and has been informed by a long association with the archaeology of Cossack and Western Australia, as both an academic and a contract archaeologist. I would like to thank my former supervisors at the University of Western Australia, particularly Ian Lilley and David Bulbeck for their friendship as well as their interest and guidance in a subject and research area unfamiliar to either of them at the time. I truly thank them for the amount of effort they put into being my supervisors. I would also like to thank Ian for his more recent advice on research options and Martin Gibbs, for his long friendship and his early unofficial mentoring role as the only other historical archaeological student in the department. I include secure thanks to Kenneth Lewis for his generous long-distance unofficial mentoring and support to a stranger interested in the same research area.

I would also like to include thanks to Martyn Webb, my historical geography lecturer; those imparted wisdom shaped my interest and understanding of the mechanics of economic distance and bid rent and my maritime archaeological colleagues who helped shape my understanding that what happened on land could be shaped by what happened on the seas. Also I should include a "thank you" to Ian Elliot for introducing me to GIS systems. But further back than that, I would like to thank Rod Stewart, my history tutor, for giving me an "A" for my first university essay. A mark that convinced a shy mature age student that she really did belong within the hallowed walls and gave me a confidence in myself that has been with me ever since.

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Research also does not happen without a field crew and I would like to thank all the local residents and Pilbara visitors who happily grasped the opportunity to give "the lady in the hat" a hand at a real archaeological site. They taught me a valuable lesson in the process, which has shaped my professional life. Although our society and school system teach Western Australians that archaeology and heritage is something that happens elsewhere, giving the public a chance to be involved in archaeology in their own "backyard" instills a sense of heritage worth, and a sometimes fierce commitment to "their" site. Hence, a long private and professional interest in public archaeology and a long slow fight to change perceptions at the government level that effectively marginalize historical archaeology within Western Australian heritage.

Lastly but not least, I would like to thank my family. Mum for her unwavering belief that I was wonderful, her unfailing interest in everything I did and for not complaining too much about the long wait to laugh at me wearing the funny doctoral robes. Pops for the oral history information that helped win me that "A" and my daughters for their love and three months of unpaid assistance as my Cossack field crew, even if it did put them off following in my footsteps. Also recent thanks to Simon and Jennie for proof reading the volume.

Contents

Chapter 1
Introduction

This research introduces the historical archaeology of Western Australia through a study of two colonisation events in 1829 and 1863 which, between them, settled most of the land claimed and named by the British Empire as Western Australia (Fig. 1.1).

The Western Australian story is overwhelmingly the story of the spread of market capitalism, a narrative which is at the foundation of modern western world economy and culture. Due to the timing of settlement in Western Australia, there was a lack of older infrastructure patterns based on industrial capitalism to evoke geographical inertia to modify and deform the newer system. The forces of market capitalism therefore had free rein to mould the settlement and economic systems of the state. This makes identifying the systemic patterns which grew out of market capitalist forces clearer and easier to delineate than in older settlement areas.

The emphasis of this research is on the historic period colonisation, stressing changes to the colonising system rather than the devastating effect colonisation had on the existing indigenous societies of Western Australia. The stories of indigenous and coloniser are, however, intrinsically linked as the existing population were not passive objects existing in time and space within an empty land. They variously helped, fought, and became a part of the new system. In the terms of Paynter's (1985) model of frontier surplus production, they were social actors who actively tried to deflect and mould the new system to get a better outcome for themselves and their families.

In Western Australia there were three colonisation events within the historical period aimed at long-term settlement, these events were the type of process Steffen (1980) called insular frontiers. Two colonisation waves started within Western Australia while the last crossed the top of Australia east to west from Queensland to the East Kimberley towards the end of the period under study. The main colonisation events, however, were the founding of the Swan River colony in the state's southwest and the founding of the northwest colony based in the Pilbara and West Kimberley.

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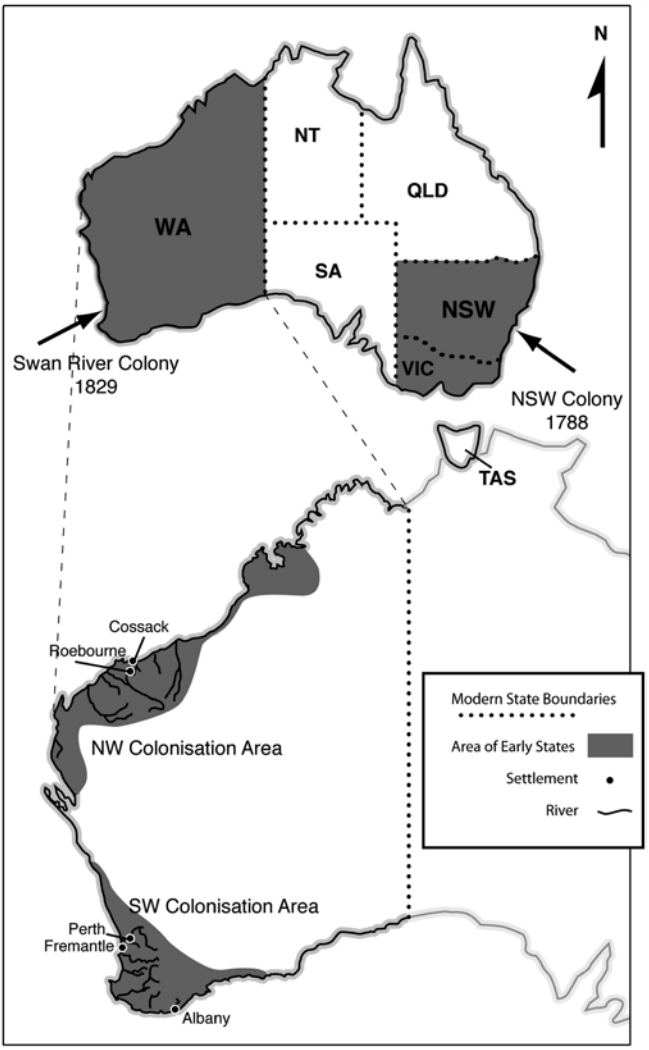

Fig. 1.1 Location of southwest and northwest colonisation areas

The Swan River Colony

The historical settlement of Western Australia officially started on 18 June 1829 with the arrival of the first governor, Captain James Stirling, at the Swan River. However, Britain had already laid claim to the territory in 1826 by the raising of the flag by a small party of soldiers and convicts sent from the New South Wales colony to found a settlement at King George Sound. The purpose of this action was supposedly to prevent the French or any other European government from claiming the territory (Crowley and de Garis 1974, The Department of Premier

and Cabinet 2008; Ward 1967). However, it should be noted that the King George Sound was the best natural harbour in Western Australia and it was located on the Great Circle sailing ship route which serviced the New South Wales colony. The harbour was already used as a distress and resupply stop before Lockyer's party arrived and the possibility of compromised supply lines if an unfriendly nation claimed the land may have been a factor in the military governor's decision. The group founded a small settlement on the sound which was vacated at the founding of the new colony; therefore, they did not create a lasting impact on settlement within Western Australia.

The British colonised Western Australia amid a frenzy of settlement labelled Swan River Mania. They brought with them ideas of social relations based on British social structure and a mono-cultural mixed farming system. Under the harsh realities of Western Australian conditions, social mobility increased and the farming system changed to a pastoral-dominant system.

Examination of the Swan River colony is structured around three levels of analysis: regional, town, and site as the overall form and structure of a colonising system cannot be established from one or two sites. However, a regional approach requires a pool of published archaeological data to inform it, but there is still little archaeological research to form such a pool. Therefore, of necessity, regional analysis is of the historical and geographical database only. Town site analysis is informed by both historical research and archaeological survey as is site level analysis. However, very little excavation data has been published on early settlement sites in the Southwest providing little material for comparative analysis.

In Chapters 2 and 3 the Swan River Colony and the historical geography of its trade relationships, land use, settlement patterns, and cultural system from first settlement to the 1860s is examined and structural change modelled. Town and farm layouts are also analysed from a combination of historical and archaeological research to elucidate underlying patterning and the available artefact database material is compared to extract any similarities.

The research shows that the market realities of economic distance and available transport technology heavily shaped what was grown, where it was grown, and whether towns flourished or died in the southwest. By the 1860s the British mono-cultural mixed farming system had mutated into a pastoral-dominant form of mixed farming spread over land in several regions, worked by convict labour centrally controlled by an owner pastoralist. Indigenous Australians were largely excluded from this cultural system which remained mono-cultural.

The Northwest

The northwest of Western Australia was colonised by the sons and daughters of the Swan River colonists and those of Victorian colonists lured to the northwest by the prospect of generous land regulations. Both brought with them differing land use practices; the West Australians had a modified mono-cultural pastoral-dominant

system based on meat/fleece sheep and wheat and the Victorians used a mono-cultural pastoral system based on wheat and fine fleece sheep shepherded in temporary folds. Under the extreme northwest conditions during the period under study (1863–1910), both systems transformed into a multicultural system based on pearling, pastoralism, and marginally on gold mining, that incorporated Indigenous Australians, first generation Australians, Asian, and British participants in a fluid situation where power relationships were negotiated and created between cultural participants regionally and inter-regionally.

Examination of the northwest settlement is structured around four levels of analysis: inter-regional, regional, town site, and site. Chapter 5 examines the colonisation of the northwest and its aftermath at the inter-regional and regional levels through historical and geographical databases. The government of the Swan River Colony administered the northwest region, but the Swan River Colony itself was governed from Britain. This situation meant that the new region was effectively governed by two regions, setting up a multiregional power struggle for the resources of the northwest. Trade relationships and the exercise of political power are examined at the inter-regional level to determine how power wielded and resisted at this level shaped the northwest settler society and their relationship with the entrepreneurial sections of the Swan River Colony and British society.

Chapter 5 also explores geographical, economic, and social factors within the region in order to delineate how they affected the northwest settlement system and its economic use of the land and sea. Integral to this is the effect of power negotiations between sections of the settler society, the indigenous population, and migrant workers brought into the region by the colonists to provide an alternative cheap labour force.

At the town site level of scrutiny negotiations over contested space, labour, resources, and culture are examined through the landscape. Analysis of historical records, town layout, architecture, and archaeological survey information associated with the pearling ports of Cossack and Broome considered in Chapter 6 show that it is possible to recover evidence of power relationships frozen into the landscape of the towns.

At the site level, excavation data from the first substantial building in the port of Cossack, the Knight, and Shenton store, is used to show how northwest inhabitants used material culture to negotiate power and status relationships through the 50-year period under study.

Rapid Change: The Methodological Problem

Historical archaeology has long been recognised as having a unique contribution to make to the social sciences due to its focus on two independent databases, the historical and the archaeological (Galloway 2006; Hall 2000; Leone and Potter 1988; Little 1994). The interplay between the two sources has an “increasingly recognised potential for theorising, analysing, and describing strategies of power,

expressions of all levels of ideology, and dynamic interactions" (Little 1994:23) between groups of social actors, cultures, or individuals as well as giving a voice to those sections of society overlooked by written history.

However, Little was still forced to describe that potential as "largely untapped" due to methodological problems (Little 1994). The presence of historical documentation opens up the complex issue of how to use both sets of data effectively. It also compels historical archaeologists to confront the inadequacy of archaeological methodology when dealing with fast, complex and wide-ranging social changes.

Social negotiations within a rapidly changing society are fluid and rapid, making it difficult for archaeological methodology to delineate temporal units capable of examining these manifestations of successive negotiations within material culture. This creates a particularly pertinent problem of linking excavated materials to research questions. Such questions often require much finer division of the archaeological database than current methodologies can supply, thus creating a fundamental disconnection between potential and actual ability for many areas of research.

For any research questions or theories to be valid within archaeological research, archaeologists must be able to use the archaeological record, not just the historical record to answer the questions posed. If this cannot be done, then the archaeological record cannot be used to answer key questions, relegating archaeology to a "fill in the gaps in history" role (Deagan 1982:157). Such research would do little to advance historical archaeology as an intellectual discipline in its own right.

Rapid change creates this methodological problem of linking questions to excavated material in many areas for archaeologists. One such problem area is for archaeologists interested in delineating separate households within the archaeological record as shown during a major reanalysis of material excavated at "Little Lon" in Melbourne, Australia.

The research attempted to align excavated material with "some 300 principal tenants" consisting of families, sub-tenants, and owners at 19 locations (Murray and Mayne 2003:91). Only two of the principal tenants were successfully aligned to excavated data and described in publications (Murray and Mayne 2003; Murray 2004). Historical information that a site was occupied by a variety of short term tenants and sub-tenants is then at odds with an archaeological excavation record described as a "depositional palimpsest" (Murray 2004). Faced with documentary evidence of a shifting short-term population and an archaeological record only coarsely dated as pre-1880 (Murray and Mayne 2003:95) the research emphasis had to shift. The stated aim of "recovering the 'lost' community" (Murray and Mayne 2003:89) by linking history with archaeology gave way to a more general one of examining changes within archaeological assemblages with dates of approximately 40–50 years duration (Murray 2004:127).

The problem of being unable to date excavated assemblages to fine enough chronological divisions to apply questions derived from historical information or archaeological theory is not unique to "Little Lon" or even Australia. Other archaeologists grappling with a variety of questions centred on households (Allison 1998; De Cunzo 1987; LeeDecker et al. 1987; Smith 1992) point out "it is extremely difficult to isolate the remains of a single household archaeologically" (Allison 1998:18).

Sometimes this is due to post-depositional factors, but the main problem is that archaeologists cannot date their deposits finely enough to match the requirements of research questions that look at shifting populations or rapidly changing processes.

Colonisation, frontiers, and borderlands are also research areas where the confrontation with this archaeological methodological shortcoming is very acute as the research targets areas and events with shifting populations and rapidly changing processes. Western Australia is no exception. Local histories (De La Rue 1979; Erickson 1978; Fall 1972; Garden 1977, 1979; Sanders 1975; Shann 1926; Staples 1979; Withnell-Taylor 1987) indicate that the time frame that frontier theorists and historical geographers would describe as the frontier period lasted only approximately 30 years in the southwest and approximately 50 years in the northwest. This is a much shorter period of time than that defined for the early American frontier by Lewis (1975) which he declared was "archaeological abrupt" (Lewis 1975:57). To delineate how change is occurring within Western Australia during these periods requires an even finer chronological division of archaeological data compounding the difficulty of the task. The solving of this methodological problem is then a major aim of this research, addressed through the study of excavated data from a store site at Cossack, once the main port of Western Australia's northwest frontier.

In Chapter 7 a methodology is constructed that divides the excavated data into chronological databases of approximately 10 year periods. This allows Chapters 8 and 9 to compare, contrast, and search the material culture of the 1870s, 1880s, and late 1890s for manifestations of social negotiations within the archaeological record.

Think Globally, Dig Locally (Orser 1996:183)

The research on these two Western Australian colonisation events makes clear that although the events, and my research on them, are localised they are part of a system of colonisation and trade which expanded Britain into a world empire. Chapter 9 of this volume sets a local archaeological assemblage within the global context of archaeological research by evaluating it against patterns found within America, an area settled earlier during the push of Northern European societies out across the world, but also with a sweep of colonisation westwards which closely matches the dating of the colonisation of Australia's northwest.

The global process of colonisation and the frontiers it creates has shaped much of the archaeological record studied by historical archaeologists and it therefore formed an important area of research which has languished in recent years.

Australia is very much a product of this global process and the idea of the frontier "is one of the most pervasive, evocative tropes underlying the production of national identity in Australia" (Davis 2005:7). The same is true in America where Turner's (1893) influential work assigned the frontier a leading role in shaping North American culture and in doing so influenced a nation's perception of itself.

This line of thinking sees frontiers as the crucible in which a nation's character is forged and it is enshrined in legends such as the "Wild West" in America and the Australian legend of the "Bush" and the stockmen and swagmen who inhabited it.

These figures are seen as resourceful and rugged countrymen, appearing larger than life when compared to the pale and insipid town dweller. Such perceptions were popularised by the stories and poems of Lawson and Patterson and exemplified by "Clancy of the Overflow" and "The Man from Snowy River" (Patterson 1889, 1890). Views still perpetuated in films such as "Crocodile Dundee".

However, changes in focus in the social sciences in the 1960s and 1970s towards a concern with the ordinary people overlooked by a historical narrative focused on the grand scale led towards a concern with race relations, multiculturalism, ethnic pluralism, and women's rights (Furniss 2005:27). This in turn led to a questioning of terms such as "frontier" (Bhabha 1994, 1996; Fahlander 2007; Faragher 1993; Grossberg 1996; Schortman and Urban 1992; Slotkin 1992; Stein 2002) and a rejection of the term as "being too 'nationalistic', 'racist', and ethnocentric to be useful" (Limerick 1991). In historical archaeology this has led to a decline in research expressly using the term "frontier", although other sub-disciplines in archaeology such as Roman, Chinese, and prehistorical archaeology appear not to have the same conceptual problem with the term. It appears in book and article titles (Hells 2005; Osei Tutu 2006; Sagona and Sagona 2004; Schon and Galety 2006) from these disciplines and the Chinese have at least one department of frontier archaeology.

In Australia the usage of the term frontier among archaeologists and historians studying the colonising system has declined since the 1980s when Birmingham and Jeans (1983) called for a paradigmatic shift to put frontier theory at the top of the research agenda in Australia, sparking off sporadic attempts to pursue frontier research here (Allison 1998; Birmingham et al. 1988; Birmingham and Jeans 1983; Bairstow 1984; Murray 1988; Nayton 1992a, b). Since this time research on the European systems colonising Australia has faltered with only Lawrence's (2003a, b) work on the British colonial society really within the same field, although the use of the term frontier is avoided.

The situation in history and prehistorical contact archaeology is very different. The emergence of the debate termed the "history wars" on the nature of history, historical method, and the meaning given to terms such as "frontier" and "conflict" has changed the emphasis in these areas to one on frontier conflict (Attwood 2005; Attwood and Foster 2003; Cowlishaw 1999; Macintyre 2003; Manne 2003; Reynolds 1982; Rose 1991, 1997; Smith 1980; Windschuttle 2002). Australian contact archaeologists have also followed this broader trend researching the nature of conflict on Australian frontiers through indigenous heritage sites (Barker 2007; Litster 2006; McHarg 2006). Therefore, you have a research situation where an area is a frontier if seen from an indigenous viewpoint, but the "F-word" (Klein 1996) is deemed not appropriate if the colonising society is the one under scrutiny.

This situation has arisen because of the heavy reliance on the concept of "frontier" in the nation building mythology of settler societies springing from the push of Northern European societies out of Europe in the eighteenth and nineteenth centuries and the enthusiastic use of this by historians and archaeologists following the Turnerian (1893) concept of the frontier. Some historians such as Klein (1996), Furniss (2005), and Davis (2005) have now moved to reintroduce the term (defined as a zone of interaction), into analysis partly because simply not using the term does not protect analysis from ethnocentrism (Furniss 2005).

From my own point of view whether you use the term "frontier", "colonisation", or "third space" (Bhabha 1996), you are dealing with the same physical space, a place where a new cultural system is being inserted, often at the expense of a cultural system already occupying the space. This process, and the social dislocation it causes, has been going on long before the terms "colonisation" and "frontier" were coined and value laden.

Historical geographers specialise in studying the patterns produced by human settlement in historical times and they have long realised that this process of settlement and dislocation produces discernable patterns of penetration (Casagrande et al. 1964; Leyburn 1935; Thompson 1970) in the colonising society. In historical times the dislocated indigenous society was often one without a written history making it harder for geographers to discern their patterns of dislocation without the help of archaeologists. Archaeologists, however, also started study of the colonising society first with Lewis (1975) being the first to draw together the results of previous geographical work on the settlement patterns of the penetrating society and apply them to archaeology. As a historical archaeologist my work follows this vein in that it studies the penetration patterning within the colonising society rather than the dislocation patterns within the indigenous society, which in Western Australia would come under the umbrella of prehistorical or contact archaeologists working under the *Aboriginal Heritage Act 1972* rather than historical archaeologists working under the *Heritage of Western Australia Act 1990*.

Many aspects of the work of historical geographers, port geographers, and network theorists are analytically useful for archaeologists studying the spatial patterning of settlement within a colonising society. Economic distance has a strong influence on the spatial patterning of settlement within a region and on the composition of an assemblage of artefacts through its effect on prices. Therefore, concepts which help measure this affect such as central place, bid rent, and networks can be useful tools when analysing change. Chapters 2, 3, 5, and 6 utilise the work of port geographers such as Rimmer (1967), Taafe et al. (1963), and central place and network theorists such as Berry (1967), Christaller (1966), Hall (1966 for Von Thunen 1875 translation), Yuill, and Whebell (summarised in Jeans 1973:79) and Zubrow (1990) and urban locational theorists such as Papageorgiou (1990) to delineate the regional and town site patterns produced by the two Western Australian colonisation events under study.

Australian Historical Archaeology

Despite over 40 years of practice, Lawrence, at the turn of the millennium, could accurately accuse the discipline in Australia of being largely concerned with description and conservation. Stating that "After a decade of excavating urban sites in Sydney, Melbourne, Adelaide, and Hobart ….These excavations have essentially told us nothing about even simple questions like how colonial Australians set their tables" (Lawrence 1998:13). She also states that the field's lack of impact is demonstrated by the lack of

inclusion of archaeological results within major studies of Australian material culture (Isaacs 1987; Maynard 1994; Serle and Lane 1990) and I would add to this of Australian history. The history wars currently being fought within Australian research over the nature of history, method, and meaning within the parameters of Australian colonisation are being waged without any reference to the research of contact period archaeologists and with no input from historical archaeologists. Only two historians, both with unusually strong links to historical archaeology through work on cultural resource management projects, have included archaeology research results as a major component of a written history (Karskens 1997; McGowan 1994, 1996, 2000).

There was, and continues to be, a lack of a tradition within Australia of supporting the significance of Australian historical remains. Murray and Allen (1986:85) saw this as the key to understanding why preservation of heritage within cultural resource management has been the main justification for historical archaeological work. This is still true today with cultural resource management still employing the bulk of Australian archaeologists. This, however, means that most research is linked to short-term cultural resource management objectives, which hinders the disciplines' efforts to impact on a larger stage.

While there are undoubtedly difficulties in pursuing pure research aims within a cultural resource management setting, lack of intellectual justification can be identified as a greater problem. Australian archaeologists have not yet proved to the wider audience the importance of Australian historical archaeological sites to understanding Australia: how it developed, why it developed that way and how people were shaped. The web-based "Archaeology of the Modern City" project (La Trobe University 2005) is the first Australian attempt to overcome this limitation.

To achieve this aim effectively, Australian archaeologists need to demonstrate repeated, significant results which cannot be derived from historical documentation alone. A herculean task, when they have not yet grappled seriously with the methodological problem of linking the bulk of their evidence, excavated artefacts, effectively with the questions generated by historical documentation or problem-oriented research. It is hoped that this research will go some way to alleviating this problem and allow the discipline in Australia to produce the results it needs to make the advances to demonstrate its intellectual worth.

Chapter 2
The Swan River Colony: Settlement of the Southwest

Western Australia is Australia's largest state and the second largest subnational entity in the world. With an area of 2,525,500 km^2 (five times the size of Texas), it occupies the western third of the Australian continent with climate ranging from tropical monsoonal in the far north, Mediterranean in the southwest and semi-arid to desert in the rest. Its capital city of Perth is the most isolated capital city in the world with the nearest large city being Adelaide in South Australia. Perth itself is closer to East Timor and Indonesia than to Sydney and Melbourne, with the distance between Perth and Sydney being akin to that between London and Moscow.

It is a vast and wonderful land with a mining industry that underwrites much of the Australian economy. Yet it sits far from the seat of national federal power and the bulk of the Australian population, 77% of the population reside in the eastern seaboard trio of New South Wales, Queensland and Victoria (Australian Bureau of Statistics 2007). The concentration of the Australian population in one main area leads to a cultural mind stance of "them and us" summed up nicely by Josh Thomas's televised quip "Perth, Adelaide, I knew it was one of those places no-one cares about" (Thomas 2009). The long history of being overlooked or held to be not very important by Federal politicians and other Australians has left Western Australians with a feeling akin to inferiority crystallised in the nickname of "Cinderella State".

It is well known that colonial Australia was founded as a penal colony on a Sydney beach in 1788, yet the Western Australian Swan River Colony was founded only 41 years later in 1829 (Fig. 1.1). It was the first free settlement colony in Australia with only the penal colonies of New South Wales, Moreton Bay (Queensland) and Van Diemen's Land (Tasmania) established before it.

Yet the Cinderella State does not glory in its historical heritage, Western Australians generally do not believe that it has any worth bothering with. The small time difference and the long history of being ignored may have led to this perception of lack of heritage worth, with Western Australians themselves generally perceiving the heritage of the eastern seaboard to be older and more valid. This perception is reflected in the lack of appreciation of the existence and worth of archaeological heritage in Western Australia, even by heritage professionals and political leaders. It is sincerely hoped that this manuscript will help change that perception.

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The Swan River Colony: Settlement of the Southwest

Western Australia is vast, and the environmental conditions faced by colonists were so different that in the northwest a second, separate wave of colonisation was created that was different from the Swan River Colony, although ruled through the latter colony. As environmental conditions are one of the forces which can shape and constrain settlement, some understanding of the physical conditions within settlement areas clarifies the history of settlement and exploration decisions during and after first colonisation.

The first of the colonisation events was the 1829 settlement of the Swan River Colony in the southwest of the state. The vegetation survey of Western Australia (Beard 1981) provides most of the pertinent information on the environmental conditions within the southwest.

Climate

The southwest can be divided into four major Mediterranean climatic types differentiated by the number of dry months in the year. These vary from Moderate Mediterranean with 3–4 dry months in the extreme southwest to Semi-desert Mediterranean in the goldfields with 9–11 dry months.

The region's weather is controlled by high and low-pressure systems which move one after another, eastwards across the state. In summer, the systems move across the Perth region, bringing a succession of hot dry days followed by shorter cool changes. Summers are essentially long, hot and dry with some local rain along the coast and isolated thunderstorms in the interior. Perth temperatures reach around 40°C for short periods during the summer with lower maxima recorded for the extreme southwest.

In winter, the weather systems are further south and have weaker anticyclones which allow the development of cold fronts. In Perth, temperatures rarely fall below 10°C, but the lower southwest and inland can receive light frosts. Most precipitation occurs during winter. There are two rainfall gradients within the area, the west coast and the south coast. The systems overlap along the south coast from Denmark to Cape Leeuwin, and this area receives the highest annual rainfall for the region (1,400-mm). Generally, rainfall decreases from around 1,000 mm per annum near the coast to 250-mm inland in the Goldfields.

Geology

The southwest can be divided into three general regions: the coastal lowlands, the plateau and the plateau margins. The greater part (the plateau and plateau margins) belongs to the Western Shield, an area of old deeply weathered Precambrian rock forming a mix of clay, clay loam, lighter earths and sands, all of which are relatively

infertile. The plateau margin forms a low cliff called the Darling Scarp, and its soils are ironstone gravels.

Between the Darling Scarp and the sea are located the coastal lowlands of the Perth Basin, an area of former beaches which occur as sandy soils arranged as a series of narrow belts running parallel to the coast and the scarp. Closest to the coast are white sandy soils, with a strip of infertile coastal limestone behind containing freshwater lakes. Behind the limestone are older grey sands which contain peaty swamps between the ridges formed by former beach dunes. The most fertile soils are confined to the river valleys and a belt of alluvial soil lying between the grey soils and the scarp. The belt of infertile coastal limestone stretches along the entire western coast of the southwest region to a point just to the north of Bunbury where it peters out allowing the more fertile soils to approach closer to the coast between Bunbury and Busselton.

The area contains several rivers draining west and south from the plateau to the coast. The largest of these rivers is the Swan River, which also has a large tributary called the Canning River. None of the rivers are navigable for any length by sea-going vessels. Flooded estuaries are common features, but bars blocked those on the Swan and Murray. The estuary of the Preston and Collie rivers forms a sheltered harbour as does that of the Blackwood, but the best natural harbour in the southwest is King George Sound at Albany.

Vegetation

While the soils of the southwest are, for the most part, relatively infertile, they supported tall forests and woodlands which to European eyes suggested fertility. In the extreme southwest are tall wet sclerophyll forests of karri, jarrah and marri. Dry sclerophyll forests of jarrah and marri occur on the ironstone soils of the plateau, while woodlands of marri and wandoo are found on the plateau's loamy soils. Tuart and jarrah woodlands form open stands on the coastal limestone from Bunbury northwards with banksia woodlands on the sandy coastal soils. At the time of European settlement, most of the woodlands were open and park like due to regular firing by Aboriginal people.

Further north past Lancelin and inland on the plateau, widespread sand plains are covered with Acacia–Casuarina–Melaleuca thickets. The southern part of the plateau and the coastal region east of Albany carries extensive mallee, mallee scrub and mallee heath. Dryandra–acacia heath occurs inland and along drier coasts with wind-pruned heath being very common all along the coastline. Sedgelands and succulent steppe are found around swamps (sedgelands) and saline lakes (steppe).

Area History

The following outline of southwest history has been gathered from several sources such as general Western Australian histories (Battye 1924; Crowley 1969; Stannage 1981),

local histories (Erickson 1978; Fall 1972; Garden 1977, 1979; Richards 1978; Sanders 1975; Shann 1926; Staples 1979) and works on historical geography (Cameron 1975, 1981; Pitt Morison 1982).

Permanent settlement of Western Australia began in 1829 with the founding of the Swan River Colony. Accidental and purposeful surveying by Dutch, English and French navigators had largely filled in the outline of the coast, but the overall impression was of a barren and waterless land. French interest in the better-watered southwest coast prompted the military settlement of King George Sound (Albany) by the New South Wales colony in 1827. King George Sound was the best natural harbour known on the west coast and already acted as a distress stop for ships on the Great Circle route to Sydney.

Vlamingh noted the presence of the Swan River in 1696. Baudin explored it in 1801, and it was explored again by Captain James Stirling in 1827. Although Stirling explored both the Swan and Canning rivers, exploration was confined to the river valleys with their richer alluvial soils. Stirling's expedition led directly to the founding of the Swan River Colony with Stirling as its governor.

Exploration before settlement had discovered the potential harbours at King George Sound, at the mouths of the Blackwood and Preston rivers, and at Cockburn Sound located to the south of the Swan River. Early exploration after settlement was confined largely to the Swan River area with smaller investigations centred on the harbour at King George Sound and the mouths of the Murray, Preston and Blackwood rivers. One overland trek was also made to connect the settlement at King George Sound to that on the Swan.

The next round of explorations investigated the extent of the Avon valley on the plateau, (the upper stretch of the Swan River was misnamed the Avon, as it was initially thought to be a different river) and searched for land routes along the coast between the harbours. It also explored Cape Leeuwin between Augusta and Busselton and investigated the hinterland of Albany more thoroughly. Exploration after this expanded out from Perth and generally connected up the harbours by land. The more fertile soils in the Bunbury and Busselton hinterlands were fairly intensely explored out to the overland track between Albany and Perth.

Settlement of the region began in the Swan River valley with the choosing of the sites of Fremantle and Perth. Stirling had been instructed to choose a site of the future seat of government by weighing:

> the advantages which may arise from placing it on so secure a situation as may be afforded on various points of the Swan River against those which may follow from establishing it on so fine a port for the reception of shipping as Cockburn Sound is reputed to be. (Sir G Murray HRA. Series 3 vol 6:600 cited Pitt Morrison 1982)

Stirling had to defend his choice of site for Perth to the Under Secretary for the Colonies who wanted to know why it had not been placed on the point of land where the Canning and Swan Rivers met. Stirling listed several reasons for his choice. They were not necessarily listed in order of importance. The reasons were as follows:

1. The site had building materials.
2. The site was at place where the rocky soil of the coast gives place to rich alluvial.
3. If the bar at the river mouth was removed, an excellent harbour would exist from the town to the sea.
4. Because of the river bar, two towns were needed, one at the river mouth and one high enough up the river to have easy communications with the agricultural lands.
5. Although not mentioned by Stirling, the site also possessed freshwater sources without which settlement would have had been impossible.

Building materials could also be found at the site between the two rivers enquired about by those in London, but it lay within the infertile limestone belt. Stirling clearly recognised that the colonists living in Perth would need to grow food to survive, and this factored strongly in his site choice as did transport considerations. The site of Perth is in fact at the head of a drowned estuary, wedged on that part of the river which is past the infertile coastal limestone but before the first serious natural obstacle to lighter traffic on the river, the Herrisson Island mudflats. It is also situated on the same side of the river as the majority of the agricultural land found in Stirling's 1827 survey.

The port of Fremantle was situated in a bay immediately south of the Swan River mouth where a short land isthmus divided it from the waters of the Swan. The bay was partly protected by a limestone cliff from north and north-westerly winds, but was open to southerlies. The land to the north of the river mouth did not offer any bays, being a long sloping curve to Rous Head. To the south of the port lay the waters of Cockburn Sound sheltered by Carnac and Garden islands but with difficult and uncharted approaches.

Fremantle's position puts it on the opposite side of the river to Perth. Transport and communication routes went from the riverside of the isthmus up the river to Perth or crossed the river just east of the isthmus and followed the riverbank to Perth.

When Stirling arrived in Western Australia, the first task he set to his surveyors was to chart the approaches into Cockburn Sound. However, the early arrival of immigrant ships meant that this work was abandoned and the two town sites were chosen and surveyed. By early September, there were 135 settlers and their families. Grants to 21 of these exhausted the previously explored fertile land on the Swan. Land was allocated in thin strips running perpendicular to the river giving each grantee a small section of river frontage, some fertile alluvial soil and a lot of the less fertile soils further from the river (Cameron 1975:19). A secondary pattern was also established based around the freshwater lakes.

Explored land on the Canning River which had already been promised in a large grant to one settler was re-allocated in November and a further 11 families settled. People applying after this were told to settle further south at Port Leschenault (Bunbury). The existence of the sheltered inlet there was already known, and Stirling sent men to explore its three rivers and their surrounds during 1829 after they had explored the Murray River.

Port Leschenault was declared in 1830 and was the first satellite of the main settlement, being declared even before Guildford, the major early settlement on the Upper Swan. Plantagenet County at Albany was thrown open for settlement soon after followed by Guildford, Augusta, York, Northam and Beverly in the Avon valley. An overland route between Perth and King George Sound was explored in early 1831, and the town of Albany was proclaimed. The towns of Kelmscott on the upper Canning and Kingston on Rottnest Island were also proclaimed in 1831.

Land in the Murray district had been granted to Thomas Peel, the settler whose large Canning grant had been re-allocated. He was granted 25 miles of the right bank of the Murray plus the coastline to Point Peron. Peel temporarily settled his people outside his grant in the Cockburn region (Clarence), which was closer to Fremantle (Burke 2007). He also sent some of his people to Point Peron (Rockingham) and to the mouth of the Murray River (Mandurah) to prepare the area for permanent settlement.

The resistance of the southwest Nyungar peoples to this colonisation of their homeland was mainly scattered and sporadic. While relations between the indigenous peoples of the southwest and the new arrivals were initially cordial, the newcomers did not understand indigenous protocols or the idea of reciprocated hospitality, which led to misunderstandings and reprisals including spearing or stealing provisions (HCWA 2007). Indigenous people must have also started to realise that the newcomers were staying this time and they were settling on areas of good water and fertile soil, which were also the areas which supported the indigenous populations. Between 1829 and 1834, farms on the Upper Swan came increasingly under reprisal-type attacks stemming from mistreatment or misunderstandings. These prompted retaliations by settlers including the use of armed force against Fremantle Nyungars, designed to impress fear of the newcomers' superiority of arms on Nyungars (HCWA 2007).

Only in one area did indigenous resistance halt colonisation for any appreciable length of time. This was on the Murray River where resistance successfully confined settlement to a small area around Mandurah for 4 years until the battle of Pinjarra in 1835. The Murray region was fairly densely occupied (for hunter-gatherer densities) by the Bindjareb Nyungar peoples, three indigenous family groups totaling approximately 85–100 people. The men of the Binjareb Nyungar made a name for themselves almost from first settlement as people fiercely resistant to giving up control of their lands (HCWA 2007), and they were thought responsible for the first death of a settler at indigenous hands. This was followed by attacks on Peel's groups of settlers at Clarence and Rockingham in 1830, attacks during which several indigenous men may have died, thus setting up further payback actions.

It did not, however, stop Peel, supported by a small garrison of soldiers, from moving people to Mandurah. The soldiers immediately mounted a serious, if probably unintended, attack on the economic and spiritual life of the Binjareb Nyungar by breaking the stone fish traps which blocked the Murray and Serpentine Rivers. These traps formed the economic basis to support large social gatherings for ceremony and trade which were at the centre of economic and cultural life for the Binjareb Nyungar.

This action led to indigenous attacks on the soldiers barracks, the retaliatory forming of local colonial militia and a worsening of violence. In 1832, a soldier was killed and another severely wounded in separate attacks; a later attack on the barracks by a strong force of warriors was only halted by the arrival of more soldiers from Perth. Peel and his settlers were also threatened, and in 1834 the Binjareb Nyungar were blamed for raiding a mill in South Perth. After this, some of their leaders were captured and publicly flogged, with one being held in prison for 2 months to ensure good behaviour before being flogged again and released in June 1834.

Shortly afterwards in July 1834, Edward Barron, a retired major, who had killed a Nyungar man in a earlier conflict in the Perth area arrived in Mandurah to buy a mare from Peel, only to find that the mare had disappeared into the bush. Binjareb Nyungar men tried to lure both Barron and Peel out into the bush to look for the lost mare but succeeded in only luring Barron and a servant of his, a young man called Hugh Nesbitt. Both were attacked and Nesbitt was killed, becoming the first settler known to be on friendly terms with indigenous peoples to be killed. This prompted a great deal of fear and anger throughout the colony in mid 1834.

Governor Stirling arrived back in August from a trip to England to a fearful colony calling for punitive action. Therefore, in October, Stirling set out to Mandurah with a party of 24 that included twelve soldiers and six mounted police. The party aimed to find a large party of the Binjareb Nyungar that Stirling's sources had told him was camped at the river, at a place which soon afterwards became the town of Pinjarra. Stirling's party camped at Ravenswood just short of Pinjarra and the next morning Stirling sent Captain Ellis, Norbett and three mounted police to scout out the Nyungar camp on the western side of the river. Meanwhile, he positioned the rest of his men at the two fords and along the eastern bank of the river. Ellis's group startled the Nyungar people and pushed them towards the river where they were caught against the steep river banks in a classic military pincer movement.

What happened next is variously known as the Battle of Pinjarra or the Massacre of Pinjarra depending on whether the viewpoint is settler or indigenous. Colonial accounts of numbers killed vary from 15 men to 25–30 men, women and children (HCWA 2007). They also describe the party as a large band of warriors with women and children. The oral histories of the Nyungar suggest that the higher number range is more correct and also that the warriors were elsewhere and the group attacked was the family camp of old men and women. But whatever the true number, sex and age of those killed, what is certain is that the event was catastrophic enough for a small population of only 85–100 to completely disrupt the social fabric of the Murray River tribes and seriously impair their ability to resist the colonisation of their lands. With the Governor having personally removed the obstacle to settlement, the first colonial settlers moved to Pinjarra only months later early in 1835.

The declaration of towns and the number of acres granted in each area of the southwest suggest widespread and dispersed settlement by 1837. However, the actual pattern of land alienated was very clustered, and the importance of the rivers is noticeable, for not only was land alienation centred on the rivers but also all the towns were also on them.

The rivers were important as transport corridors for both water and land routes. This is shown in the shape and placement of grants which were predominantly rectangular, with one short side lying along the river so that the maximum amount of grantees had river access. Rivers were also important as sources of freshwater and fertile soils.

Not all the alluvial land on the rivers was taken up, especially that on the southern rivers. Alienation at Bunbury centred on the navigable parts of the rivers, as at Augusta and around Albany. Alienation on the Murray started at Pinjarra which was the limit of navigation but which also marked the start of fertile lands. At Bunbury and Busselton, fertile lands reached close to the coast, so this limiting factor was not at work there. Alienation at Busselton was constrained by the lack of a river corridor rather then fertile land and was concentrated close to the coast. The bulk of alienated land across the southwest was on soils more fertile than the coastal limestone; however, in Perthshire some of this land was alienated too.

The expansion of alienation within Perthshire appears to have been constrained more by carting costs and the spatial distribution of fertile river soils than by lack of river navigation. However, Guildford, the inland agricultural town on the Swan River, was situated at the limit of lighter navigation and Kelmscott, which was beyond the limits of lighter navigation on the Canning River branch of the Swan River remained for a long time a town in name only.

There were three major areas of settlement beyond the navigable parts of the rivers. The largest of these was the Avon Valley (Upper Swan), which grew wheat and wool and relied on carting its produce to Guildford for lightering down the river to Perth and Fremantle. The second largest was in the upper regions of the Kalgan and Hay rivers beyond the dense wet sclerophyll forest of the lower regions surrounding Albany. To avoid the worst part of the forest, the land route between Albany and Perth also passed through this area, providing a transportation link to both harbours. The third was at the Williams River which was also on the overland route between Albany and Perth. Both these southern inland regions relied on walking stock to market.

In 1850, the free colony of Western Australia became the last of the British Australian convict colonies. The large pastoralists were the main agitators for convict labour. They had a problem not only with the scarcity and high cost of labour but also with the attitude this encouraged. Convicts provided a cheap and subservient underclass, and the pensioner guards who initially guarded the convicts were settled on the land as small farmers in small agricultural village type arrangements.

Gibbs (2001, 2007) has studied the shape and nature of the convict system in Western Australia and compared it to that in the penal colonies along the eastern seaboard. He concludes that the "reformatory, punishment and security elements of the NSW and Tasmanian convict establishments were completely absent" (Gibbs 2007:67) in Western Australia. The aim of Western Australian colonists in accepting convicts, which they demanded be young male minor offenders from rural backgrounds, into their free colony has been categorised as a tripartite aim of "providing cheap labour, providing public works, and encouraging imperial funding" (Gibbs 2007:67).

The Western Australian system was based around a central prison and a system of hiring depots, road and work stations, ticket-of-leave depots and branch establishments with road and work camps where construction was happening (Gibbs 2001). Unlike the early system in the eastern seaboard colonies, where isolation and security played a main role in the location of system elements, in Western Australia the main elements of the system, the prison, hiring depots, road and work stations, were located close to pockets of settlement density. The majority were located within the Perth–Fremantle–Swan valley central region, but a system of regional hiring depots, road and work stations were located in or adjacent to all the major population centres in the southwest. Additionally, a convict hiring station was located at Lynton shortly after the area was opened up for settlement and mining with the intention of aiding the opening up of the area and providing labour for the newly established government mine in the area.

The convicts not only provided a cheap and subservient labour force for the large pastoralists but they also provided the colonial government with the manpower and funding for public works. Not only did they build accommodation for themselves, their guards and administrators but they were also used extensively to build public buildings, roads, bridges, culverts, jetties, river and sea walls and carried out drainage and land filling projects, with much of the work aimed at improving the flow of goods and communications throughout the colony. Trinca (1997) when analysing the patterning of the Western Australian convict system and the development of a Western Australian police force suggested that the convict system also helped the colonial government to establish a security and surveillance network throughout the colony linked by the improved road network to help define the colonial landscape as a series of regulated places.

With the convicts came pensioner guards, retired soldiers who received passage to the colony for themselves and their families, a grant of land, cottage and other benefits in return for guarding convicts on the journey and for a period after they landed. They also had to spend 7 years in the Enrolled Pensioner Force, a reserve civil defence force. The pensioner guards were settled on the land as small farmers in villages close to depots and other centres of convict activity (Gibbs 2001).

The Western Australian convict system was clearly not shaped as a system of punishment, although that obviously occurred. It was overwhelmingly a system to support the production and transport of raw materials from the colony to the British homeland core, and thus the shape of the system is a pattern that have been carved by capitalist forces creating the differences between the earlier punishment regime of New South Wales, Tasmania and Queensland.

Land Regulations

The Swan River colony initially operated a system of land grants. In 1831, the Ripon Regulations were introduced to force granted land into cultivation or to have

it revert back to the government. The regulations also introduced a high price for buying crown land.

The Ripon Regulations for freehold land were still in force after later regulations were introduced for leasing crown land. The government was forced to introduce leasing by the spread of illegal occupation of crown lands by pastoralists during the 1840s. In 1851, crown land was divided up into A and B class land. Class A land was all land within three miles of a town or two miles of the coast or permanent water. Class B land was everything else.

Pastoral leases on Class A land were available on annual lease, while those for Class B were available for 8 year leases. Up to 20,000 acres of either class of land could be leased with a minimum section of 1,000 acres. Class A leaseholders had a pre-emptive right of purchase of the leased land, but limits were placed on the purchase of waterholes.

A system of tillage leases was also put into place. Tillage leases could be located anywhere in the colony and were for 8 years and could be renewed. A tillage lease could be for up to 320 acres.

Agriculture

The evolution of southwest agriculture has been studied extensively by Cameron (1975, 1981:172–174). His research has been drawn on to derive the following outline of the southwest agricultural system and the social system that went with it.

By 1860, the southwest colonists had evolved a mature system of land management with regional specialisations, which is classified by Cameron (1981) as a pastoral-dominant form of mixed farming. The technology and labour demands of raising stock and crops had been blended into a year long system in which each part complimented the other. This system is best documented in the Avon Valley.

Nov–Dec. Breeding flocks sent to outstations with a shepherd and a mobile shepherd's hut (called Cabaroo). Studs and wethers kept near homestead for closer care. All flocks kept in temporary folds at night. Small summer crops of potatoes and maize may be planted near homestead.

April. All flocks returned to homestead for lambing and to collect manure for crops. Sheep kept in temporary folds on land to be ploughed or manure collected from folds and spread over fields. Manure ploughed in, usually with the first rains.

May/June. Seed steeped in strong brine solution to contain smut and to aid germination. Wheat or barley seed was broadcast by hand over manured fields once the rains had started and was then ploughed in. Double harrowing after planting and enclosed with a fence (Ditch and bank, post and rail or brushwood fence).

After planting lambs were tailed and flocks reorganised and sent out to outstations again. Most were sent to nearer outstations but scabby sheep were sent to distance locations for treatment.

Aug. Young crops rolled to promote vigorous growth and compact soil to retain moisture.

Sept. Flocks brought in for shearing before the grass dried and caught in the fleece. Sheep washed 3 days before shearing and dried in a small fold strewn with blackboy rushes. The fleece was cut in one piece and then thrown onto a table where small dirty pieces were removed before it was tightly packed into a bale of similar quality wool.

After shearing, flocks were again divided and cured scabby sheep returned to their flocks and newly infected ones removed and sent to outstations. The rams were put in with the breeding flocks and the previous season's lambs removed and sent to outstations for weaning; wethers were probably castrated during this time.

Oct. All flocks returned to homestead and crop harvested.

Nov. Breeding flocks sent back to outstations.

The seasonal round concentrated on the two major crops of the system, wool and wheat, but the system was more diversified than this suggests. Cattle (both meat and dairy) also formed an important part of the system. Meat from sheep rather than wool was also important, so important that pastoralists had to compromise between market demands by breeding sheep with large carcasses with the best coat possible, instead of smaller sheep with fine wool for the British market alone. This pastoral-dominant form of land management allowed successful occupation of the inland areas of the southwest. It spread from the Avon valley northwards to the Victoria District near Champion Bay (Geraldton) and southwards to Albany and Esperance.

Through the device of operating dispersed pastoral leases, a pastoralist could deploy his stock over a wide area, bringing them back to the homestead for shearing and breeding. Similarly, tillage leases and freehold land were used for crop growing in favourable areas close to transport rather than throughout the region within which a pastoralist operated.

Social System

Southwest pastoralism evolved a social system different to the powerful squattocracy that emerged in eastern Australia. Flocks were smaller than commonly found in the eastern half of the country being 2,000–4,000 rather than over 10,000. Sharing flocks and labour were also common and led to a more complex social system than in the eastern Australian states.

This system consisted of large pastoralists in command of extensive operations, urban share owners of smaller flocks, rural share owners or managers of combined flocks, small agriculturists, high-wage-earning shepherds, labourers and servants, and after 1850, convicts to provide a cheap labour force.

Indigenous Australians were mainly excluded from this social system and pushed to the fringes of the occupied land and early towns. However, at the extreme limits of the southwest colonisation, in areas finally occupied in the early 1870s indigenous labour made up a large part of the pastoral workforce. The settlement around Esperance occurred both after the end of the transportation of convicts to the colony and after the initial phases of northwest colonisation, which had successfully incorporated indigenous people into the pastoral system as the mainstay of the work force. The Esperance settlers found themselves at the same disadvantage as the northwest colonists as no convict hiring stations or ticket-of-leave depots were set up within their region but were able to learn and adapt from the initiatives of their northwest colleagues whose process was reported regularly in the Perth newspapers.

Southwest pastoralists used convicts not only to replace expensive, independent free labour but also to create a landscape that reflected their desired social order. Virtually, all of the large southwest pastoral mansions were built during the 1860s by convict or ticket-of-leave labour.

Gibbs (2007) states that the archaeological evidence of elements of the convict system such as the Lynton Convict Hiring Deport and associated pensioner guard village provides an insight into the social and economic relationships the colonial government and large pastoralists were intent on creating. He concludes that the archaeology suggests "yet another attempt to manifest the yeoman ideal" (Gibbs 2007:66) with the Lynton depot and proposed town, established as they were ahead of major settlement, providing a chance for them to plan settlement to conform to their ideals.

Their ideal appears to have been an underclass of ticket-of-leave men providing agricultural and pastoral labourers easily acquired from a depot located in the middle of the town in close proximity to the intended church, school, police station and core administration building locations. The location of the station within the retail ribbon of the intended town clearly shows its function was economic not penal. The depot also contained an immigrant depot to provide women of suitable class and marriageable age for the labour force to encourage stability and permanence once the ticket-of-leave had expired.

The pensioner guards appear to be the intended second social tier. They were granted small blocks in small villages at the edge of towns, including Lynton suggesting that the ideal cast them in the role of yeoman smallholder and tenant farmers (Gibbs 2007). Gibbs presumes the middle social tier was intended to be the free settlers to the region expected to be working smaller landholdings, working trades, running shops or undertaking mining activities with the large-scale agriculturists/pastoralists and top government administrators at the top of the social order. This suggests that the mindset was little changed from that of the first wave of colonial administrators and large-scale colonists such as Peel who brought with them the ideal of an agricultural landscape based on the British model of landed gentry, middle classes and urban and rural poor providing labour.

Architecture

The first Swan River colonists brought with them ideas about suitable rural architectural styles based on the Georgian style that was still common in rural England. The first shelters were either huts built of local materials or prefabricated homes brought with the colonists. Huts were of timber, thatched and enclosed by brushwood. A widespread design appears from a contemporary drawing to have been the V-hut, which was shaped like a large thatched tent over a central ridge pole (Friend 1830 illustrated in Pitt Morrison and White 1979:513). Prefabricated homes were also in timber with wall panels fitted to pre-cut timber frames; however, no early V-hut or prefabricated homes are extant in Western Australia to compare historical information to physical evidence.

Also little archaeological research has been funded on first settlement sites in Western Australia. Peel's original town site of Clarence (Burke 2007) has been located and is now the only long-term research site in Western Australia. Unfortunately this research is in early stages and only one journal article (Burke 2007) has been published. Burke (2004) also surveyed sites associated with settlement along the upper Swan River from 1829 to 1860. His survey found 123 features such as fences, irrigation channels, standing buildings and building sites. Combining historical and archaeological research, he could identify no difference in construction materials between homestead and worker huts, but he did identify attempts to maintain a class system in the layout and size of buildings.

The homestead complexes he studied had a sequence of first tents or wooden frames covered with hessian, then wattle and daub buildings constructed within 6 months of arrival (1830–1836) followed by buildings of brick, mixes of brick, rammed earth and ironstone or timber, with timber the predominate material (1837–1846). He identified that the wattle and daub house or early brick-based house built for the gentry owner within the first 6 months was still quite substantial, in the order of 39 by 12 m (Burke 2004:120). Between 1847 and 1860, a third larger brick house would have been built on a narrow point of land, visible to visitors with building size and aesthetics, suggestive of an English country farmstead giving "a statement about social standing and the maintenance of power and control" (Burke 2004:334). Worker buildings, although also replaced in brick, were, in contrast, smaller and placed to be out of the sight of visitors and the homestead.

Historical sources such as early census records (1832, 1837) and contemporary descriptions help with defining a pattern of construction materials but are less helpful at defining ideologies frozen into landscape. They suggest that in Perth buildings created from local materials were of wattle and daub, mud brick, split log or limestone walls with lime mortar used to cement and plaster brick and stone buildings. Limestone was burnt and mixed with yellow sand to produce the coarse mortar and limewashes. Roofs were of bush pole framing covered with thatch or wooden shingles. No homes built before 1859 are still standing in the central Perth/Northbridge area to be compared to the scant historical information. There are six later homes dating to between 1859 and the mid 1860s (HCWA 2009). All but the

1859 bishop's residence are small brick homes in the Victorian Georgian style with thick walls, steep hipped roofs and small double hung windows with three described as having a basic four room layout.

Historical information also suggests Fremantle had a larger percentage of limestone buildings due to the availability of the material. Limestone was used in rubble stonework with some government buildings being constructed from cut limestone blocks (Pitt Morison and White 1979:519). Despite being built in the more durable stone, none of the Fremantle residential buildings from the period 1829 to 1849 are extant and available for comparison. However, some later buildings survive. There is one government built terrace of homes constructed in 1851 in the Victorian Georgian style and ten houses built between 1860 and 1880 surviving (HCWA 2009). Two of the three houses with confirmed construction dates of ca. 1860 are described as colonial Georgian in style, being small houses built of limestone with roofs sloping down over the verandah and small paned windows. The other building, originally a shop and residence, was built in the Victorian Georgian style, the style of all five of the other houses, all being built after 1860. All but one of these buildings were limestone, with two being limestone rubble.

There are 24 pre-1840 homes still standing in outlying districts of the southwest which architects can study and compare to historical information. According to historical information, dominant materials in outlying areas varied. In the Murray district, the main early materials were mud brick or wattle and daub (Richards 1978) but only one of these buildings survives, an 1830 old colonial style pise (rammed earth) homestead with a high pitched roof and a broken-back verandah. Two early stone buildings are extant, both in Mandurah (HCWA 2009). Ecott's 1830 two-room stone cottage is described as colonial vernacular with small jarrah framed windows, front verandah, a bagged limewash finish to the rough stone walls, an internal dividing wall which does not reach the ceiling and an ant bed floor covering under jarrah floorboards, which extends out onto the verandah. Hall's 1833 cottage of squared limestone blocks is larger with five rooms, four of which were bedrooms, kitchen, laundry and bathing arrangements being built separate to the house. The style is a simplified old colonial Georgian with a broken-back roof, a central chimney, jarrah floorboards and a verandah around three sides.

There are eleven other early extant places from the Murray region, three of which date to the 1840s. Two of these are of handmade brick with the third being the only surviving cottage in Western Australia built of black gin (Xanthorrhoea, the Australian grass tree). All are small cottages with the architectural style of only one being described in the Western Australian heritage database (HCWA 2009), that being noted as Victorian Georgian. The region also has three handmade brick homesteads built ca. 1850; the architectural style of the two smaller homesteads is not described in their heritage listing but that of the grand homestead at the centre of a homestead "village" is described as simple Victorian Regency. One of the remaining places dating to the 1860s is a Victorian Georgian brick homestead complex also associated with elites, while the other four are smaller homesteads and cottages of old colonial Georgian or Victorian Georgian.

In the Avon Valley historical sources say mud brick, stone or rammed earth (pise) homes were dominant (Garden 1979) and three from the 1830s still survive with

their style described as vernacular (HCWA 2009). In York there is a pise cottage which originally had a grass tree roof with an L shaped plan which includes a kitchen at the short end of the L with a large storeroom taking up much of the long part; beyond the storeroom were a living room and two bedrooms. In Northam, an adobe homestead, one room wide with front and back verandahs, survives as does a stone cottage which might have originally been a shepherds hut associated with an absentee landowner but which by 1836 was the homestead. Northam also has three stone and mud mortar buildings left from the 1840s with the first surviving building from Beverley, a vernacular styled abode homestead also from this period.

In the forested lower southwest historical sources say slab houses or wattle and daub was dominant. Slab houses were built with timber slabs caulked with clay. Chimneys were of timber lined with clay or of stone, and roofs were thatched. Associated huts were often of bark or thatch (Staples 1979). Four wattle and daub homes remain, two are from the 1840s, one from 1850 and one from 1869 (HCWA 2009). All are described in the heritage database as wattle and daub with stone chimneys. One is described as a two roomed farmhouse while the 1850 home is Victorian Georgian in style.

Only three slab homes remain, one in Busselton and two in Harvey, with one dating to 1840 and the others to 1860. One 1860 house is described as old colonial, while the other two are vernacular in style. Of the other surviving pre-1870 houses in the southwest, 17 are of stone, 5 are of adobe or mud brick, 6 are of handmade brick, 11 are of brick, 3 are of weatherboard and one is of a mix of stone and rammed earth. In style, 35.5% are described as Victorian Georgian and 25.5% as vernacular, given that the 31% which do not have a style described in the heritage database are also likely to be vernacular this gives a percentage of up to 56.5%. Both materials used in the surviving houses and the variety encompassed by the term vernacular suggests more variety and less formal style then in the metropolitan areas but unfortunately the descriptions contained in the heritage database are often lacking when describing both style and layout.

Based on the pre-1850 homes which have been preserved and historical information which is mainly pictorial architectural historians suggest ground plans are of two main types, a simple rectangle and a long design often only one room wide (Pitt Morison and White 1979). The rectangle design was often double storeyed and allowed for a simple unbroken hipped roof. The design was Georgian in style with regularly spaced windows and doors. It is suggested that windows were wooden shutters on simpler houses and double sashed square glass panes with glazing bars on the more elaborate. A front, one storey verandah was soon incorporated into this basic design. The long design was usually single storeyed and surrounded by a verandah with rooms opened onto each other or onto the verandah. Before 1850 a third general design can be identified as being present in towns. This design was two storeyed with a verandah and balcony at the front (Pitt Morison and White 1979:520).

The most common homestead design is thought to have been a rectangular cottage with either a hipped or gabled roof over two rooms divided by a central passage or a central room with access to two flanking rooms. Verandahs are thought to have been quickly incorporated into the homestead design. It is thought homesteads grew by adding on separate rooms linked by verandahs and breezeways with kitchens often

moved away from the main house in this process (Molyneux & White 1979:184). However, these identified designs are based on information from a tiny portion of early colonial buildings which have happened to survive and on pictorial information which is also not extensive for the early colonial period. It is clear that archaeological research on early colonial buildings has the potential to overturn this perception of two simple designs possibly to one of variety around two central themes.

The presence of convicts between 1850 and 1868 created a cheap labour force that was used both by the government and the wealthier colonists to improve buildings, communication and transport. The dominant style was still based on Georgian, but ground plans became more elaborate, and roofs often had semi-octagonal bays around which the encircling verandah followed. The verandah roof was usually separate from the main roof with small eaves and decorated brackets, plates, fascias and barges (Pitt Morison and White 1979:528). A common plan was a single storeyed building, square in plan being two rooms wide and two rooms deep with a lean-to behind enclosed by the same roof. A verandah then encircled this on three or four sides (White 1979:174).

The high cost of imported building material such as ironwork, nails, bolts, glass, paint, door and window frames restricted their use to a few government and private buildings (Campbell 1979:91). Bricks were made wherever pockets of clay were found and either sun dried or burnt in small kilns. In Perth, some high-quality bricks were available from a brickworks established to the east of the city. Roof shingles were usually made from casuarina with framing constructed out of jarrah or karri once the difficulties of working jarrah had been mastered. Jarrah was also used for floorboards with joining and moulding the only part of the construction where imported softwoods might dominate (Campbell 1979:91). The colonists quickly learnt that softwoods were easily destroyed by termites.

In country areas, successful pastoralists used convict labour to update their homes. In the Murray district, the typical homestead was built of bricks or limestone with wooden shingles and had wide verandahs, a central passageway, a large cellar and a separate kitchen. On the largest estates, the homesteads were large enough to be called mansions with up to fourteen rooms (Richards 1978). The Avon Valley had also moved up to larger brick built homesteads that were enlarged even further by convict labour (Garden 1979). In the southwest by the 1850s, the homestead had become a timber cottage which was extended with brick using convict labour or replaced entirely with a new house. The better quality homes of the 1860s were of pit sawn timber, local bricks, stone or local limestone with a wooden shingle roof (Staples 1979).

An overall picture of the size of houses and the materials used at the end of the southwest study period can be gained from the 1870 census. These figures show that 73% of buildings had less than four rooms with a further 27% having four to six rooms. The mansions of the large pastoralists and entrepreneurs with their 14 rooms, while dominating the local history information and heritage listings, were in a decided minority. Slate, tile or iron roofing was also in a minority with only one percentage of roofs being in these materials, 66% were shingled and the rest thatched with a larger percentage of thatch being used in the country areas.

In Perth, brick was the dominant building material, with limestone being dominant in Fremantle. Bricks were also found in country areas with good clay deposits such as the Avon and Murray valleys (Pitt Morison & White 1979:48), but timber was the popular all-round building material across all areas of southwest settlement. Unfortunately, the small timber buildings which made up the bulk of the pre-1870s housing stock are less likely to have survived successive waves of development pressures long enough to become heritage listed. Where they were replaced by pre-1950s building stock, archaeological evidence of design and use may still survive. However, unless the replacement building is now heritage listed on the State Register of Heritage Places or on a local government town planning scheme heritage list, evidence is not protected and is very unlikely to be ever excavated and researched.

Chapter 3
Port Systems and Trading Networks

Given the geographical conditions of the new land and the historical particularities of the colonizing system, what cultural patterns did market capitalist forces carve into the landscape of the southwest of Western Australia and how do we delineate them?

The primary tasks of market capitalism are to satisfy supply and demand; therefore, supply and distribution networks are essential to the functioning of a market capitalist system. The new addition to the British capitalist system, Australia, is an island continent and, in the eighteenth and nineteenth centuries, the only way to set up supply and distribution networks to an island was by sea transport. Therefore, all trade outside the Swan River Colony relied on sea transport.

In such a situation, frontier and network studies overlap with studies of port systems. Such studies firmly link the development of hinterland resources with differential transport and port development.

Port Systems and Trading Networks

Notions of distance employed by archaeologists are largely static, defined as the length of space between two points. However, economic distance is a more fluid concept which is better employed when dealing with a supply and distribution network. The economic distance between two points is measured by the cost of getting people or goods between those points. Such costs are of vital concern to a supply and distribution network. Factors such as new sea or land routes, new technology, reducing the cost of risk by acts such as surveying coasts and harbors and the development of a strong demand for either imports or exports can alter the economics of supply and demand between two points, in effect shortening or lengthening the economic distance between them.

A port, which could provide good facilities and good trade possibilities would attract more vessels and cost less for freightage than one that could not. Thus, two ports on the same coast, at an equal physical distance from their main market, could be, in fact, at widely divergent economic distances. Equally, one port could be at different economic distances from its main market during the course of its working lifespan.

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Economic distances within the port hinterlands are equally variable, changing with improved routes and variations within the settlement patterns.

Economic distance, therefore, has a strong influence on the composition of an assemblage of artifacts through its effect on prices. It also affects the spatial patterning of settlement and land use within a region through the costs involved in getting goods to market.

This has been acknowledged by archaeologists by the incorporation of parts of central place theory into areas such as frontier theory (for example Lewis 1975, 1985; Pearson 1981; Rubertone and Thorbahn 1985). However, the possible influence of water-borne transport on the location and material culture of land sites has not been well articulated by archaeologists. The effect of river transport has been acknowledged (Paynter 1982), but the impact of interregional factors such as sea transport on the location of towns and artifact composition within a region is less considered.

However, there are geographers and archaeologists who do specialize in studying both port systems and the development of networks within their hinterlands. Pioneering work by Bird (1971, 1980), Rimmer (1967), and Taaffe et al. (1963) still inform models within this field today (see Barke 1986; Hayuth 1981, 1988; Kuby & Reid 1992; Lago et al. 2001; McCalla 1999; Notteboom 1997; Rodrigue & Notteboom 2006).

Rimmer's model (1967) is particularly useful when studying the development of supply and demand networks, as it links hinterland development with the development of sea transport routes. In the first phase of his model, an occasional ship services a series of tiny ports, each with its own inland penetration route. In the second phase, some of the ports have inland centers serviced by major route ways with smaller feeder routes edging into the hinterland of their neighbors. These ports grow at the expense of the ports next to them and consequently are visited more often by ships that overlook the smaller ports. In the third phase, the hinterland of some ports grow faster than others and more inland centers are established. These ports are also connected to other ports by land links that help feed the bigger ports at the expense of their neighbors. Sea routes have also developed a hierarchy, with major routes centering on the larger ports, and secondary and tertiary routes servicing smaller ports. By the fourth phase, one major port and one secondary port have overcome all the other ports and are the focus of both the land and sea routes. Later research has not invalidated this model but rather expanded it by adding the processes resulting from the recent rise of traffic in containerised cargoes (Rodrigue & Notteboom 2006).

Gould (1966) followed up the pioneering work by Taaffe, Morrill and Gould (1963) with a complementary exploratory behavioral model of transport development based on game theory with exploration first aimed at covering great areas of space. This was followed by settlement and transport route growth that was aimed at organizing the explored region for further development. His pattern is based on a penetration route perpendicular to the coast or frontier similar to the early stages of the Rimmer model and frontier penetration models such as Lewis (1975), but it suggests the role exploration and knowledge accumulation play in development of a new region.

Southwest Maritime Trading Patterns

The history of settlement in the southwest shows that the overall port development pattern did mainly follow Rimmer's model with many small ports, each with an inland penetration route (a river) along which secondary settlements grew. The first of these secondary settlements were located at the end of river navigation.

However, as Rimmer's model starts with several small ports, it does not fully cover the situation in the southwest. Here, only one port was established first. By 1837, more land was alienated in the Perth–York area than anywhere else and the region also contained the bulk of the colonial population. Contrary to the picture painted by the acres of land alienated and the number of towns declared, the population was in fact clustered around Perth, Fremantle and Guildford with only small numbers in the satellite regions. Population pressure in the core area appears to have led to expansion into the Avon Valley and onto the coastal limestone. Both these areas were marginal areas for settlement in different ways, the limestone because of soil infertility and the Avon Valley because of distance from the navigable part of the river. Within the first 8 years of settlement, the original landing place through which the region was colonized had become the Port of Fremantle with an established major land route to secondary settlements within its hinterland.

Fremantle as the port for this heavily settled core region had a major advantage over the other ports from its inception. This distorts Rimmer's basic model into one that starts with one major port and several small ports. The battle of hinterland theft and dominance is then weighted on the side of Fremantle. The effect of the process of hinterland theft can be seen very early on in the districts just south of the Fremantle–Perth hub. Mandurah and Rockingham were the ports for these districts and as early as 1838 (9 years after first landing) the Murray district was linked to the Fremantle–Perth hub via the Rockingham district by both coastal and inland roads. Stock from Murray and Rockingham were walked to Perth and Fremantle rather than going through the Mandurah or Rockingham ports. Wheat, however, went down the river to Mandurah and timber to Rockingham. Both the ports functioned as small regional ports but never progressed beyond this level.

Early in the colonization process, the Perth–Fremantle hub was also linked by land route to Albany and later by stock route to Esperance. The stock route between Esperance and Perth meant that the major crops of the region, lamb/mutton and wool, did not go to the Perth or London markets via the port of Esperance, definitely lessening Esperance's use as a port. The Albany road may have also acted in the same way to prevent the seat of government having to shift south to Albany to remain in communication with the British homeland.

The emergence of Albany as the second major port in the southwest system can be explained by two factors; it was the best natural harbor on the coast, and it was the first Australian port of call for vessels sailing the Great Circle route to China. For these vessels to call in at Fremantle, they had to detour northwards out of the southern westerly winds and then make their way back down a coast with prevailing onshore winds and around the difficult Cape Leeuwin to continue their trip.

Until Fremantle could provide a safe harbor and a profitable reason for calling there, it made more sense for the captains of these vessels to drop cargo and mail for Perth at Albany. These were then conveyed by land or coastal vessel to their destination however much this inconvenienced the Perthshire population.

Henderson (1977) has modeled the type and direction of Western Australian world trade. In the 1860s, Western Australia was something of a backwater in terms of world trade. It had a small, fairly poor population, and its main port was not well situated on a major world trade route. Direct trade via the Cape of Good Hope route to Britain, Western Australia's largest trading partner, was highly seasonal, and a large proportion of British goods reached Fremantle indirectly via the eastern seaboard Australian ports. Fremantle was on average 96 sailing days away from England in 1870 (Henderson 1977:10), which led to high freight rates. Steam transport brought Fremantle within 49 days of London and improved freight rates, but they were still relatively high compared to that of eastern seaboard Australian ports. Western Australian exports went mainly to Britain and the Africa-Asian region.

The Western Australian trade pattern was for imports to reach the southwest ports such as Bunbury via Fremantle, but exports generally went overseas directly from the regional ports. The effect of a similar regional export pattern in New England was found by Paynter (1982) to be a weak zonation of people, wealth and structures, with densities of all the three receding with distance from the port.

Western Australian exports were based on staples that could stand the high cost of transport to market. In the 1860s, the most important of these were wool, wheat, timber and stock. Timber, although sought after, could only be cut where it was fairly close to the coast or a navigable river because of the difficulty of transporting it by land. It is significant that the first railways in Western Australia were private lines built by timber companies so they could exploit forests further away from water transport routes. A localized resource such as timber or metal ores forces settlement near the resource, but the resource can only be exploited if production and transport costs are less than the eventual market price of the commodity.

While the export pattern for the most part focused on the regional ports, this was not always so. Augusta, Albany and Esperance were not well located for the Cape of Good Hope route to Britain, which for ships from these ports meant rounding Cape Leeuwin and beating up the coast towards Fremantle before heading for South Africa. Although they were situated on the Great Circle route, they were on the incoming leg to Sydney rather than the outgoing leg to Britain. For these ports, the decision was whether to risk Cape Leeuwin, take the longer route via the eastern seaboard ports and China to Britain, or to take the goods overland to Fremantle. Esperance farmers in particular developed a pattern of walking stock to runs in the Avon Valley for shearing, then carting and lightering the wool to Fremantle (Erickson 1978).

Henderson (1977) also investigated the nature of the sea routes and vessels servicing the southwest ports. When he examined the tonnage and passengers traveling in coastal shipping between 1865 and 1870, the picture that emerged was very similar to Rimmer's model. The figures emphasized the importance of Fremantle as a port of call and the minor role played by Rockingham and Mandurah

and also showed an almost complete lack of coastal trade between Albany and Fremantle. The southern ports of Esperance and Augusta were of such minor importance to Western Australian trade that they were not even mentioned in the historic data. The small role these ports played in the coastal trade was due to the barrier formed by Cape Leeuwin as sailing vessels could not combat the heavy seas and head winds they encountered trying to round the Cape, especially in winter. Coastal trading with Fremantle was, therefore, largely confined to the Bunbury–Vasse (Busselton) area and Champion Bay (Geraldton) where ore from the lead mines formed a large part of the cargo.

This situation was partly addressed with the start of a coastal steamer service. P&O steamers began taking mail between Albany, Sydney, Melbourne and London regularly from 1859. In 1873, the *SS Georgette* was contracted to run a monthly mail service from Albany to Fremantle, then on to Champion Bay (Geraldton). Although the *Georgette*, being only a small vessel of 211 tons, still found the passage around Cape Leeuwin difficult, it was fast and efficient compared to the sailing vessels and soon captured most of the coastal trade (Henderson 1977:182). It, however, only called at those ports already established as being reasonable important, which were Albany, Bunbury, Fremantle and Champion Bay. This follows Rimmer's model illustrating the first to third phases with its hierarchy of sea routes.

The placing of ports on a coast is affected by natural features as well as the resources located in the hinterland. To be successful, a port needs three main assets: water deep enough for the vessels using it to float, shelter from prevailing storm winds and access to its hinterland. Bird's *Anyport* model (1971, 1980) is a scheme of development that any port may be expected to go through, which is still valid for earlier stages of port development. The site of *Anyport* is taken by the model to be an estuary head with a tidal range of 5 m. The reason for this choice is taken to be self-evident, and this assumption emphasizes just how often ports are associated with a river mouth. It is the exact siting of the port within the estuary that is thought to need explanation, not its location on an estuary. In the case of *Anyport*, the primitive port is said to start at a point where a more accessible and therefore busier place for a harbor can be located. The suggestion is far enough up the river to avoid coastal marshes and near a tributary mouth with an embayment surrounded by slightly higher ground.

The emphasis on placing ports in or at river mouths is followed closely in the southwest with all ports situated on major rivers except Busselton, which was situated on a river with only a short navigable section of waterway that nonetheless reached the fertile hinterland adjacent to the coast. Further inland penetration of the Busselton hinterland relied on the river valleys to provide a place to forge a track inland.

Maritime transport, both coastal shipping and river lighter, was also essential within a new land with virtually no road system, and until as late as the 1870s all movement within the southwest was based on river lighter, dray cart and horseback riding. While horseback riding could move individuals, goods were restricted to maritime transport and dray cart, and this affected the economic distances at which a particular export staple became unviable.

Southwest Export Trading Patterns

Central place theories such as Von Thunen's (see Hall 1966 for translation) zonation model of land use, which was revitalized in the 1960s to be more dynamic (Berry 1967; Christaller 1966; Garner 1966; Hall 1966), have been an important research area in geography since the 1960s (Elgar 1997; Mukhopadhyay 1995; Murphy 2007) with, over time, a particular emphasis on urban planning emerging (Buris 1997).

The central concept of Von Thunen's model is that of economic rent, which states that there is a certain distance from a central place beyond which it becomes uneconomical to carry out a certain land use. Von Thunen created rings of land use around a central city in an isolated state. When the perfect evenness of his landscape was disturbed by a route, such as a canal, allowing faster transport, the ring was distorted into wedge shapes along the transport route (see Hall 1966). All studies of differential development along transport routes begin with the premise that the route would cause differences in economic rent within the region, thus allowing differences in land uses. Paynter (1982) found that a navigable river distorted the weak zonation within his region, allowing clustering to occur along the river. As Paynter pointed out, such zonation should be reflected not only in land use but also in the zonation of people, wealth and structures (1982).

Since the Swan River colony was part of a market capitalist supply and distribution network, economic rent, in the form of the dynamics of the available transport technologies, such as cost per ton-mile, environmental limitations and labor requirements, should therefore be able to be demonstrated to have affected land use and trade patterns in the southwest, shaping in vital ways the developmental history of the state.

While southwest overseas exports were based on staples which could stand the high cost of transport to market, a severe constraint even on staples such as wheat and wool was the cost of transporting goods to the export port within the colony itself. In 1841, carting from Fremantle to York cost 25 pounds a ton (Garden 1979:39), dearer than shipping the same goods from Fremantle to London. In response, a system evolved where wheat was ground into flour at the homestead, then sent by cart to Guildford and then by river lighter to Fremantle. However, settlers estimated that transport costs were still effectively a tax of one shilling and six pence a bushel on Avon flour, making that shipped from South Australia cheaper for Perth consumers (Garden 1979:110). Garden's research shows that nearly a third of the cost of growing and marketing one acre of wheat in the Avon Valley is in transportation.

Within the Avon area, only those parts of the runs closest to the road to Guildford were put into wheat production, while the more distant parts of the runs were used for sheep (Garden 1979). While stock grazing could occupy the outermost edges of settlement, sheep were brought closer to transport routes before shearing.

The colonists originally brought a British-based form of mixed farming to the new colony. During the early settlement period, colonists were struggling with adapting this system to a new environment and the high transport costs to and from primitive ports on an unsurveyed coast. The system they brought could not stand the high costs, and they searched desperately for alternative viable staples.

They ended up with wool and wheat in a pastoral dominant mixed farming system, but in the process they also tried other resources. The only other resource which had a major impact on exports was whale oil.

Colonial shore-based whaling stations were established at various bays around the coast which took advantage of the migration routes of whales past the coast. Between 1838 and 1844, whale oil constituted between 20 and 80% of total exports for the fledgling colony (Gibbs 1998), although after this time it dropped significantly in importance. Gibbs documents the complicated role American whalers played within the colony. The American whalers were both a serious competition to the colonial whalers as they systematically fished out the local whale stocks and conversely were providers of temporary skilled labor and cheap specialized equipment when they became stranded on the coast. They were also an important immediate market to isolated regional settlements as they brought fresh provisions locally without the transport costs involved with sending produce to market.

Gibbs also explored exactly who the colonial whalers were, with some surprising results showing that whaling was one industry where Aboriginal men were treated and paid equally to other workers within the industry (Gibbs 1998:40). Initially, the costs involved with importing the specialized equipment meant that most entrepreneurs within the colony were involved in whaling as owners of joint ventures. However, as American whaling increased along the coast and their cast off equipment became available, the situation moved to a rapid turnover of single owners or small partnerships. The industry then moved into long-term ownership by merchants with coastal trading ventures along the west coast and by single-owner operators on the south coast. Gibbs notes that these areas were so separate that there was no overlap of owners or workers between the two coasts without explaining why that might have come about (Gibbs 1998:40).

He also correlates an expansion of whaling activity north of Fremantle and east of Albany with the timing of the expansion of pastoral activities within these areas, noting that coastal traders who were also owners of whaling stations used the voyages of their coastal vessels to set up new stations as their coastal trading links expanded. He also found that there was considerable involvement in whaling as an off-season activity by pastoralists getting established within new areas and searching for viable staples for that area.

When exports are plotted by region, a zonation of land use becomes clear (Fig. 3.1) and may in fact have been stronger in Western Australia than that found by Paynter (1982) in New England. While localized factors such as soil fertility, rainfall and forests had some effect, the pattern was mainly determined by transport differences. Sea transport was faster and cheaper than carting overland, with river transport lying between the two extremes.

Overlying and distorting this export-based pattern was a pattern generated by supplying the needs of the local population. Such patterns have been the subject of numerous papers, and the general tenets of classical central place theory as proposed by Christaller (1966) and Losch (1954) are well known. The regional network of central places is hierarchical and focused on the largest central place, which also enjoyed the largest sphere of influence. For Western Australia, this was the capital city, Perth.

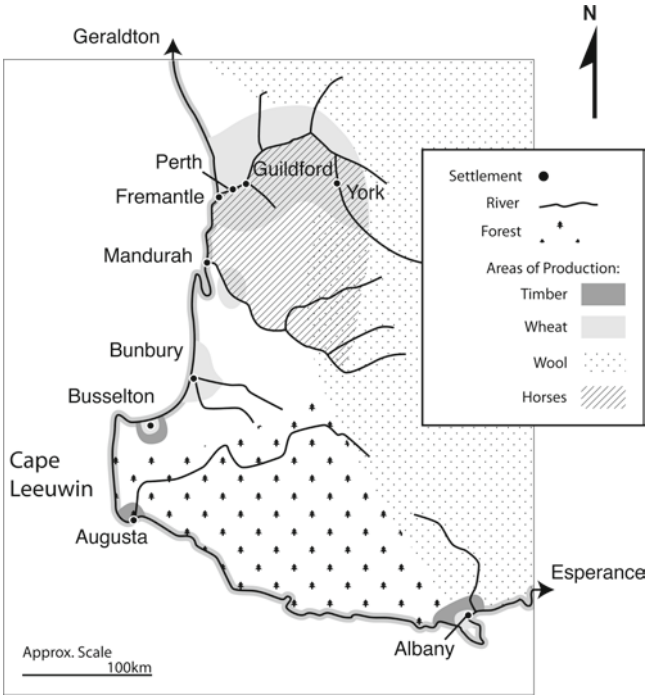

Fig. 3.1 Southwest exports mapped by region grown

Mapping what each district exported to the Perth market (Fig. 3.2) can quite easily show Perth's influence. Overall, the pattern is a distorted set of Von Thunen rings, with extreme distortion noticeably where sea transport was viable setting up smaller sets of rings based on the regional ports. Again, transport considerations played a central role with towns such as York in the Avon Valley, which had to rely on carting to Guildford and then on river transport to Perth, finding themselves economically further from Perth than Bunbury and Busselton, both of which had access to sea transport.

The advantages of sea links to Perth faded rapidly once inland from the coast. This can be seen most clearly in the Bunbury–Busselton area, the only area in Western Australia where fertile land extends all the way from the hills to the coast. Potatoes were grown for the Perth market only at those homesteads close to the ports; cheese production extended further inland, but the dairies were located close to the navigable parts of the rivers. Further inland, runs held stock only.

Through the device of operating dispersed pastoral leases, a pastoralist could deploy his stock over a wide area bringing them back to the homestead only for shearing and breeding. Similarly, tillage leases and freehold land were used for crop growing in favorable areas close to transport rather than throughout the region within which a pastoralist operated. These strategies allowed the picture of regional specialization shown in Figs. 3.2 and 3.3 to develop, graphically showing that specialization was based on economic distance, even though each pastoralist could easily be operating across several regional and specialization boundaries.

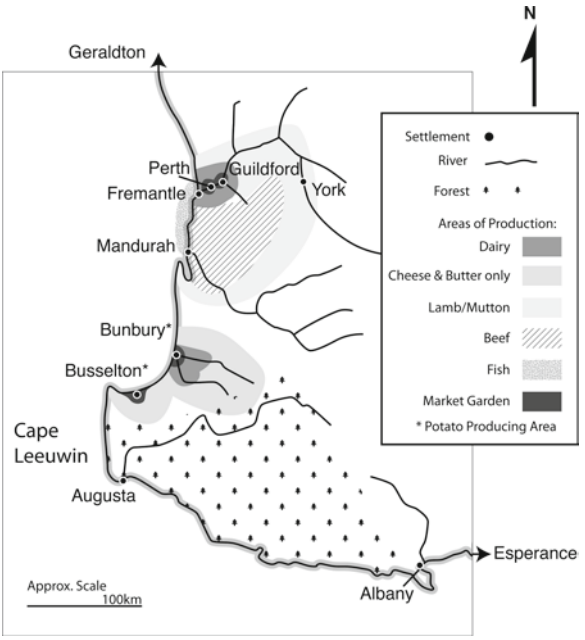

Fig. 3.2 Southwest produce exported for consumption in Perth mapped by region grown

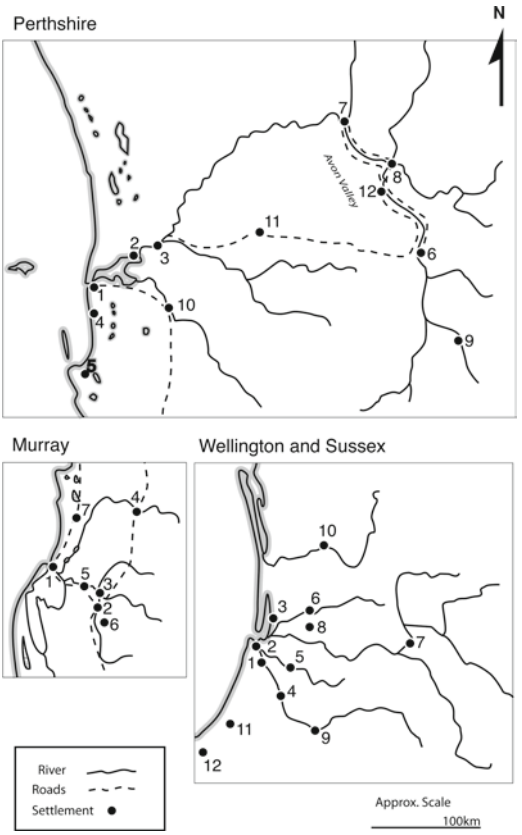

Fig. 3.3 Southwest central place K networks

The coastal area involved in supplying Perth's needs ended abruptly at Busselton. Cape Leeuwin to the south proved to be a major obstacle to sailing ships, leaving Augusta, Albany and Esperance virtually off the economic map as far as Perth was concerned. These towns did not participate in supplying Perth to any extent, and trade with Adelaide was more important to them (Garden 1977; Erickson 1978). The same barrier would appear to have affected the usually mobile whaling industry effectively splitting it into two industries.

To the north of Perth, Geraldton was also excluded from supplying Perth's needs except for the occasional overlanding of stock. This was because the distance between the two towns was too great to be economical even for sea transport.

Southwest Settlement Patterns

Yuill and Whebell both suggest that settlement within a region is affected by the presence of barriers and corridors (summarized in Jeans 1973:79). Barriers may be physical or cultural such as the presence of thick forest or hostile indigenous people and either prevent settlement or deflect it elsewhere. Natural features such as valleys and mountain gaps may force colonization into narrow corridors with few feeder routes between corridors. Zubrow (1990) demonstrated that New York State was colonized using the rivers as corridors, which allowed easier inland penetration.

These models suggest that as well as the location of resources, the presence of rivers, valleys, mountains, forests, swamps and other natural features affect hinterland penetration and spread. In the southwest, the pattern of exploration suggests that the triangle of dense tall wet sclerophyll forests of karri, jarrah and marri between Augusta and Albany acted as a major barrier to movement and agriculture with this area shown blank on both Figs. 3.2 and 3.3. The forests on the ironstone soils of the plateau were also avoided except where it was necessary to cross them to investigate the land beyond as was done to reach the Avon Valley.

Figures 3.1 and 3.2 also demonstrate that the rivers acted as corridors. Early exploration was centered on the lower reaches of the rivers where small lighters could be used, and the production and export of staples was heavily influenced by the presence of navigable river systems. The battle/massacre of Pinjarra also illustrates that an actively hostile indigenous population could also act as a barrier to settlement. Until 1834, the fertile Murray River system could not be colonized, but within months of the military action, which broke the resistance of the Murray River tribes, colonization of this region was underway. Town and shire local histories (such as Garden 1979; Richards 1978; and Staples 1979) contain enough detail to establish an overview of settlement patterns. A close look at settlement and population location within these regions (Fig. 3.3 note numbering shows order of town formation) suggests that in the southwest, the first population center did not always form at the port owing to physical constraints such as soil infertility. However, it was always sited close by and on a navigable part of a river.

Secondary towns were later established inland, usually at the head of navigation if it was beyond the first town, and they were also located at crossroads, particularly those involving a change of transportation type. If the first town had not formed at the harbor, a port was established as part of the establishment of secondary central places.

An anomaly from the general pattern of settlement is planned settlements. Five such settlements occurred in the southwest, Perth, Clarence, Old Rockingham, Australind and Lynton. A high urban population density from first settlement, a degree of settlement planning and some control over the population itself characterized all of these settlements except Lynton, a town planned by the government ahead of settlement which never really eventuated.

Perth, a government-planned settlement, is also not completely comparable to the other three that were the result of group settlements. Of the five towns, only Perth and Australind were ultimately successful. Australind achieved this, not as the result of planning, but by the town adapting itself to its position within the region after the loss of most of its original population. Perth and the adjusted Australind fitted within what was emerging as the successful pattern for southwest regional networks. Clarence and Old Rockingham were oddities as they were not located on river or land routes and did not take advantage of fertile hinterlands. This failure to fit into the embryonic regional network accounts for the decline of these settlements.

It also accounts for the failure of Lynton. Lynton was planned as a port for the export of ore from a government mine and a newly opened settlement area. However, it was not located on a fertile hinterland suitable for agriculture and agricultural settlement shifted further south to the Greenough Flats. The port of Geraldton was established to service Greenough, and export of ore from mines in the area also switched to this port near the denser area of settlement, leaving Lynton to fail before free settlement to the town really started.

The historical pattern of southwest settlement as a whole suggests first penetration via the river valleys followed by a linking of known places usually by coastal routes and then a filling in pattern. The network of southwest towns falls into a pattern similar to Christaller's (1966) K-4 network with towns nesting in fours. This pattern is for one larger central place with three smaller centers within its hinterland arranged according to a traffic principle that in areas of high transport costs allows "as many important places as possible to lie on one traffic route between larger towns" (Berry and Pred 1961:16). Examples in the southwest are York, Northam, Toodyay and Beverley in the Avon Valley, all connected by road to York and Bunbury, Picton, Dardanup and Boyanup at Leschenaultia (Fig. 3.3), all connected by river to Bunbury. With expanding populations, these centers grew and had their own smaller centers nested around them in their own smaller K-4 networks.

The routes associated with these nesting networks are primarily hinterland penetration routes based on the rivers serviced by coastal shipping, river lighters and cart routes feeding into the river route. Feeder routes penetrating into the hinterland of other ports do not seem to have followed the same nesting pattern. This may be due to lack of population among regions. Towns on these routes appear to have grown first

where the land route crossed a major river. Secondary centers sprang up not around these first towns, but where the route passed through areas of closer settlement. This pattern more closely follows Christaller's (1966) K-7 administrative lattice in which connections are made between a given order of central place and all six of the immediately lower central places, in this case Perth and the largest central place in each sub-region.

Census information also shows that population levels within each region were quite low and not normally what would be expected to sustain a town. Town populations were even lower, more in line with English hamlets than major network centers. However, frontier researchers such as Wade (1959) have shown that although newly colonized areas have a low population, towns rise quickly and contain functions normally associated with greater levels of population. Population is not, therefore, a useful measure of centrality in these circumstances – a better measure is the number and type of central place functions.

Using this measure, it can be discerned that by the 1860s four levels of central places had developed in the southwest (Table 3.1). The most basic level was not a town, but rather a clustering of services within a focal area. This level equates loosely with the settlement type described by Casagrande et al. (1964) as semi-nucleated. The store and/or hotel were usually the first services to move into a defined town area, followed quickly by some form of government representation. Town sites were often declared at this stage and the embryonic settlement formed the first, most basic town in the newly colonized area. This level of settlement is not described by Casagrande et al. (1964) and falls somewhere between a semi-nucleated settlement with its lack of trade facilities and a nucleated settlement with its municipal government. Level three towns could be termed nucleated settlements, but they also often fulfill Casagrande's criteria for frontier towns in having been the terminus of the transportation network and the focal point of social, political, economic and religious life within the region.

Casagrande's frontier town is a distinctive settlement within his frontier landscape. It serves as a supply center for the surrounding area, receiving goods from the entrepôt but with a more restricted range of goods entering its region than the entrepôt which is the main connection to the frontier homeland. It serves as a jumping-off point for new colonists entering the area, and it is the terminus of the area's transportation network and the focal point of social, economic, political and religious activity.

Each of the river based sub-areas within the southwest function as new areas of colonization with a frontier town linked to the Perth–Fremantle entrepôt for Western Australia by a sea link. However, in Western Australia, no one town fulfills all the functions of a classic frontier town. The social, economic, political and religious functions are contained in the central place which coalesced first on agricultural land within the area but the terminus of the area's transportation network was the port. These two towns, with port on the coast and administrative center on the nearest fertile land reachable along the river, always appeared as the first two settlements within the region. The geographical conditions of infertile soils close to the coast within the southwest, therefore, appear to have split Casagrande's

Table 3.1 Level of town development of central place functions

Function	Physical expression
Pre town	*Centralizing functions scattered across neighboring homesteads in focal area*
Law and order	Police Quarter's or
	Solder's barracks or
	Resident Magistrate's homestead
Trade	Store (hotel/store may be combined)
	Semi or fully licensed hotel
Essential services	Blacksmith
	Wheelwright
	Carpenter
Religion	Services held at homesteads
Embryonic town	*Trade and Law and Order functions move into defined town site. Essential services and religion still outside town*
Port functions in embryonic port/towns	Small jetty
	Warehousing (may be within store or hotel)
Nucleated settlement/frontier town	*Have previous services plus*
Law and order	Gaol
	Police Quarter's
	Resident Magistrate
Trade	More than one store, some variety of type
	More than one hotel
Essential services	Previous functions move within town boundary
	Doctor
Religion	Church or Meeting Hall
Communications	Post Office
Accommodation	Some domestic only housing
	Accommodation for transients in hotel or boarding houses
Port functions in nucleated settlement/frontier town	Customs house and bond store
	Reasonable jetty or wharf
	Ship's stores
	Modified harbor approaches/warning lights
Full town or frontier town	*Have previous services plus*
Law and order	Courthouse
Trade	Grocer, baker, barber, draper, newsagent, fancy goods.
Essential services	Sanitation services
	Hospital
Religion	Churches of different domination's
Communications	Newspaper
Accommodation	Large permanent urban population.
	More provision for transient population
Port functions in frontier town	Large jetties or wharves
	Several warehouses
	Cargo handling facilities
	A distinct port area
	A variety of shops selling ships supplies
	Good harbor approaches
	Good warning light system with harbor lights and light houses

frontier town into two closely connected sister towns which together contain all the functions of a frontier town.

The same process split the Western Australian entrepôt into the capital city of Perth and its port Fremantle. Stirling, when he founded Perth on the closest fertile land to the coast, actually envisioned it as a major sheltered port, as the site is at the head of a drowned estuary with twelve kilometers of wide, deep sheltered waterway between it and the coast. Fremantle was a less desirable position for a port, as it was only partially sheltered with an infertile hinterland. But access to the Perth estuary was cut off by a bar across the river mouth which turned out to be a substantial bar of rock. It was not until Western Australia became a self-governing state within a new nation that the vision and money required to remove the bar and extend the port into the safety of the river became available. By that time, the settlement pattern was set, and geographical inertia ensured that the administration center and port did not merge at Perth.

Each of these central places offered services to their town and hinterland populations. Berry (1967) has correlated central place functions with the population size necessary to sustain them for Snohomish County, Washington. A total of 254 people were needed to sustain a food store, while 1,083 were needed for a department store. These figures were calculated by dividing the total population of the county by the number of food stores or department stores. While these figures may not be the result of sophisticated calculations, they are simple to do and provide a rough index of the population necessary for different central place functions to appear within a central place. Such an index applied to the southwest gives an indication of when central functions of different orders appeared and helps define the shape and nature of the settlement system.

Table 3.2 correlates the interplay between land use, settlement patterns, central place functions and population levels articulated in Chapters 2 and 3 to delineate a succession of four landscapes which appeared successively in the southwest, each with its own characteristic patterns of settlement density, town location, agricultural density and architectural status.

Southwest Urban Development

The same basic economic rent approach that underlies regional studies has allowed urban geographers and urban economists to explain the spatial location of land use within cities. As Papageorgiou (1990:3) states, “Von Thunen provides the conceptual foundation for the entire new urban economics,” and Buris, 1997, notes that by the later 1990s there was a strong use of central place tenets in reference to the pattern of service and market locations within urban centers. A key concept is that of the bid rent (Papageargiou 1990) with the three major uses of urban land, retailing, industry and residential having different capacities to pay to use a particular location, with retailing being able to afford the highest bid rents and residential having the lowest bidding capacity.

Table 3.2 Basic settlement pattern changes in the southwest

Landscape type	Description
Frontier landscape Population: Ca 100–150 Time: Ca 1830s–1840s	Land grants, many not taken up and most of the land uncleared. Houses close to water, clustering occurring near fords and limit of river navigation. Great distances between settlement nodes connected by river transport or dirt roads. Greatest clustering in a focal area close to harbor
Pastoral landscape Population: Ca 1000–1500 Time: Ca 1850s	Large pastoral runs with a homestead complex like a small village. The homestead is larger, generally on higher ground in those areas subject to river flooding, and facing access route to town. Some smaller runs which tend to cluster near route or town. More settlement nodes midway between previous ones. First nodes growing into low order towns. Largest town in focal area close to harbor, town is either a port or closely connected to a port
Settled landscape Population: Ca 1500–2000 Time: Ca 1860s	Large and small runs with low order towns growing near concentrations of small runs. Homesteads of large runs attaining mansion status. Hierarchy of towns emerging in a $K=4$ network with an improved access network between them. Larger population in both region and towns
Well settled landscape Population: >2,000 Time: Ca 1870s	Provision of railway and domination of town receiving it. Spurt of growth of both the railway town and the region. Slower growth of other towns and creation of new low order towns at important railway junctions. Some towns further from railway suffer reduction of population. Breaking of larger estates into farms creating new low order towns near the new population concentrations. Railway terminus becomes the dominant town within its region with a large urban population and the town houses of successful farming elites

Bid-rent values tend to decrease in value away from the town center, creating circular zones. However, accessibility is greatest along major routes and at major crossroads, increasing their value and distorting the rings out along these routes. Urban centers can also have sectors and clusters with factors indicating socioeconomic status tending to form sectors and ethnic status tending to form clusters within the sectors and zones (Papageorgiou 1990). High-status residential areas in particular extend in sectors, often continuously from the city center and are usually cushioned on either side by middle-class areas, while low-class or ethnic areas are located on the opposite side of the city. The high-status areas tend to grow outward along major transport routes, towards higher ground and the homes of community leaders.

A major modern city would have several different types of commercial development. Ribbon developments and retail nucleations are the two most likely developments in smaller centers. Ribbon developments are associated with transport routes. The traditional shopping street is a ribbon development and contains the lowest

order of services, those that are required on a day-to-day basis such as food stores. Retail nucleations often occur at intersections. They fall into a hierarchy of sizes with smaller ones providing low-order services and the larger high-order services.

A higher-order urban center might also have urban arterial ribbons. These consist of groups of businesses along major routes that use up too much space to compete for land in the central business district. They may also have highway-orientated ribbons of higher order services which are not needed on a day-to-day basis but which are not large-space users. Banks fall into this category.

All this urban economic research has been carried out on cities of various sizes; no one has yet investigated whether the same economic and social factors were at work in historic frontier towns.

Western Australian local histories often do not contain the geographical information necessary to gain a picture of the spatial development of towns. The development histories of Northam and Albany (Garden 1977, 1979), however, do contain sufficient information to see similarities. Also, the conservation plan for Blandstown in York contains enough historical and archaeological information to picture development (Bush 2007). Some information can be gained from the Guildford Conservation Policy (Shire of Swan, 1992) and Conservation Study, Stirling Square (Richards 1989), regarding how the town was planned to develop, but neither document demonstrates how the town did actually develop over time. However, an 1842 survey (De Chauncy 1842) of the town allows a snapshot view of town layout at that time.

In all three of the other towns, the information is sufficient to determine that the shopping street developed first and formed the center of the town. It contained services such as hotels, general stores and small businesses such as blacksmiths, but unlike similar areas in cities, these areas often combined domestic functions with business functions, either within the same lot or within the same building. As the town matured, successful business people moved their homes away from their shops and into outer areas of predominantly domestic housing.

Both Northam and Blandstown illustrate the importance of transport routes to the location of the shopping street. In Northam, the first nucleus of the shopping street began to form to the east of the surveyed town site on the York to Toodyay road, close to a permanent pool in the Avon River. When a new bridge was built over the Avon in 1859 (Garden 1979) connecting the town to Guildford and Perth, the retail functions of the town shifted to Fitzgerald Street alongside the Avon (Fig. 3.4). This area was the center of activity on the crossroads formed by the new bridge, and the move emphasizes the centrality conferred by crossroads. Non-commercial functions such as churches, schools and halls were located in a secondary ribbon development behind Fitzgerald Street, on Wellington Street. The non-retail but space-taking nature of these functions suggests that Wellington Street was what urban geographers call an urban arterial ribbon (Papageorgiou 1990).

Bush's (2007) historical research on building location and archaeological survey of surviving heritage buildings in the area now known as Blandstown shows that settlement in York started with a government farm on one side of the river and a proposed town on the other (Bush 2007). Initial settlement in the 1830s was of scattered farms with the government precinct of farm, barracks and resident

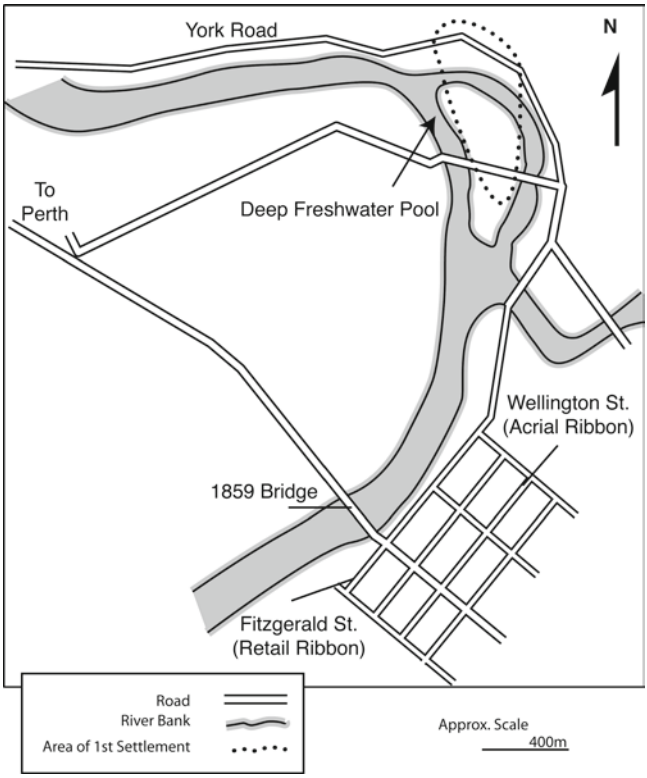

Fig. 3.4 Town layout: Northam

magistrate's house clustered near the farms. Urban settlement started in the 1840s, not in the proposed town site, but south of the government farm around two fords. There was a similar ford, usable in summer, to the north of the government farm connecting it to the proposed township of York but (Bush 2007) states that South Street at the southern base of the government enclave is shown as the major east west road (presumably the route to Perth) on an 1849 map of York. However, South Street is not where non-government settlement coalesced.

It coalesced around two fords, one of which formed the route through which a settlement further inland, Beverley, accessed Perth through the York area. Bush's heritage precinct plan when combined with her historical research on early settlement shows that this route, called the Avon Terrace through Blandstown, was the shopping street for Blandstown during the 1840s through the 1870s with a church, two hotels, blacksmiths, bakeries, a butcher, wheelwrights, a builder and a coach maker. The precinct also developed a collection of cottages, becoming a well-defined village centered on the Avon Terrace. This village flourished as the York settlement until 1885 when the eastern railway was extended to York with a station within the official government town site of York. The route from Beverley was also

shifted to link with the railway in 1886, leaving Blandstown as a backwater suburb of a new town center centering on the government town site.

Albany also shows a shopping street development, but as the town was also a port, the *Anyport* model states that a T-shaped configuration should develop. The model states that the port will develop in a lineal fashion along the waterfront until halted by a natural feature or the port's defenses (Bird 1971, 1980). Transit sheds would line the quays with warehouses for longer storage behind them, and a bridge might separate riverine and sea-going traffic. A transverse road would lead out of the port town, connecting it to its hinterland and forming a T shape with the waterfront. Therefore, following the *Anyport* model, the main transport route for Albany was not the overland route to Perth, but the sea routes centering on the beach.

Stirling Street, the main retail ribbon development in Albany, is located along the waterfront and contained the same functions as at Northam, together with port functions such as warehouses, customs, shipping agents, ships stores and the center of government control. Port facilities such as jetties, boatsheds and some warehouses were located at either end of the terrace and along the waterline.

Occupation of the town started in Parade Street using the abandoned buildings of the short-lived New South Wales military occupation. The first hotel was on the corner of this street and Duke Street, whilst the first jetty was subsequently built some distance away near a fresh water spring. The shopping-street ribbon development (Stirling Street) took place between these two extremes, with the densest development on the crossroads formed by York and Stirling streets and Spencer and Stirling streets (Fig. 3.5) after the building of a second town jetty.

A separate government complex of hospital, jail, barracks and commissariat was built near the first jetty, but other public buildings such as an Anglican Church and Mechanics institute as well as at least one other hotel appear to have been on or near York Street. York Street passed over the saddle between two large hills and formed the main land route out of Albany to Perth.

After the building of a second town jetty at the end of Spencer Street, development along Spencer Street intensified. Another hotel was built; a large combined bond store/post office/customs house/court house/police station and meeting hall, a flour mill and a P&O workers cooperative store were also built in the area. This development formed a second arterial ribbon but one which was dominated by larger-scale industry and warehousing functions.

The building of mansions by successful Albany pioneers occurred largely in a sector development that moved uphill. By the 1850s, Albany was a small town of about 50 houses spreading along the beach (Stirling Street) and up the slope of the two large hills to the east and west of the town (Garden, 1977). The slopes of Mt Melville to the west developed into a high-status sector with four of the six large mansions mentioned by Garden, being built on its slopes. One of the two other mansions was built in a location which allowed the manager of the P&O depot to overlook the depot, and the last was built within the Stirling Terrace retail ribbon development. The location of laborers' houses or ethnic groups are not mentioned by Garden, except to note that a Catholic school was located on the slopes of the opposite hill which was closer to the P&O depot and the coaling yards. A school

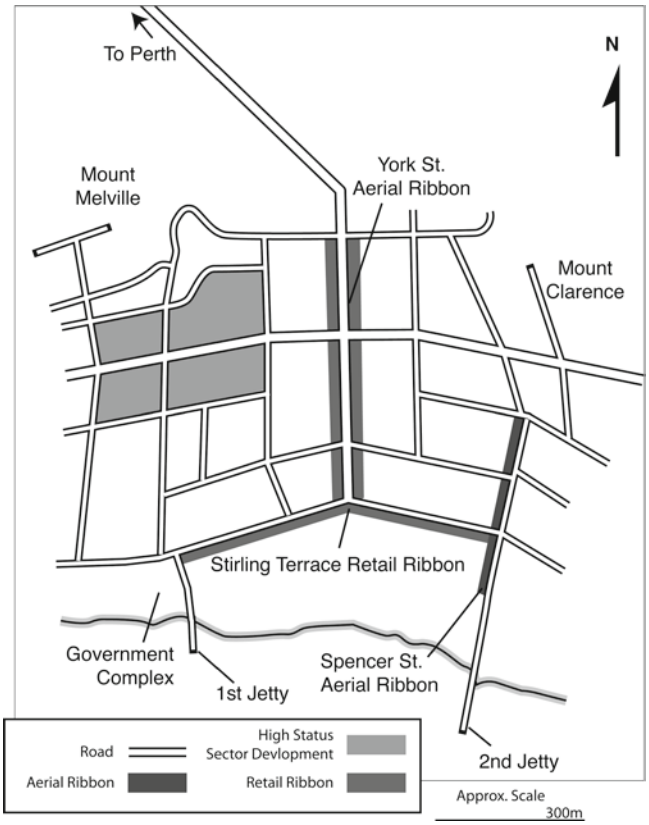

Fig. 3.5 Town layout: Albany

for Aboriginal children, which was operated as a showcase of its type, was also located on the outskirts of town at the end of York Street.

Guildford was a river port planned to be a substantial village located on the peninsula between two branches of the river and situated around a large village green with a church in the middle. This did not eventuate with Chauncey's 1849 survey of the town showing the large central square having been subdivided into a smaller area and unofficially cut through diagonally by the road from Toodyay to Perth via Guildford which crossed the Helena River at a crossing on Johnson Street. Evidence of this unofficial road was found archaeologically in 1998 (Cooper & Nayton 1998).

The first bridge in the colony was built at Drummond's Landing in 1834 and is visible on both Chauncey's 1849 and 1842 surveys of the town crossing the Helena River at a street which no longer exists to the east of Johnson Street and its bridge built later in 1842. The 1842 map shows a crossroads at Meadow Street formed between land and river routes. The main land route through the town from the Avon Valley to Perth ran into the town from the east down Swan Street and then moved

south down Meadow Street before crossing to the 1834 bridge. The public river landing was at the northern end of Meadow Street with a trail joining it to the crossroads on Meadow Street and a trail run west from the crossroads to the Swan River ferry at Bridge Street. After the 1842 bridge was built at Johnston Street, the southern leg of the crossroads moved slightly to the west to run down Johnston Street. Chauncey's 1842 survey shows the location of buildings in Guildford with a line of buildings shown on the road running at right angles to the ferry crossing and another along the river bank from Meadow Street to Swan Street, but these appear to be all farmsteads or cottages except for Devenish's "Royal Hotel" in Mangles Street adjacent to the brick-making sheds.

Most centralizing functions appear to focused on Meadow Street and Swan Street crossroads with two hotels, a warehouse, a lock-up and two cottages. The church was originally placed on the land route to the Avon Valley, not in the center of the central square as planned, but in 1858 a church was built near the western boundary of the reduced square. In the 1840s, Meadow Street consolidated as the administrative and retail center of the town until centralizing functions moved south onto James Street with the coming of the railway.

In central place-based frontier studies such as Lewis (1985), central place functions and densest occupation are on the route through the town which connected it to the outside world. In the *Anyport* model, central place functions would be split between the transverse road and the road parallel to the waterfront, with a distinct zonation occurring between the locations of generalized town central place functions and those linked directly to port function.

Where the location of the shopping street can be determined for West Australian towns, they do show a difference in the layout of the shopping street and non-commercial arterial ribbons. In Northam, the shopping ribbon was on the main transport route through the town and the non-commercial arterial ribbon lay parallel and adjacent to the main transport route through the town which was occupied by high-bid retail functions. The town layout conforms to the expectations of Lewis's model. Blandstown is similar with the shopping ribbon developing near a ford on a route through the settlement to Perth from a town further inland, but there is not enough information to determine non-commercial arterial ribbons.

In Albany, Stirling Street forms the shopping ribbon which includes the customs, shipping agents and warehousing functions of the waterfront. It lies across the main access route through the town formed by York Street and the sea routes into the port. The first non-commercial arterial ribbon actually lay along the access route through town which was clearly a lower-bid rent space than the high density of Stirling Street. High-status sector development is also indicated especially up the slopes of Mt Melville. The grouping of these functions in Albany, which unlike Northam, is a port, agrees well with the *Anyport* model. In Guildford, Meadow Street crossroads lay on both the land and river routes. There is not enough information on retail outlet locations other than hotels, but the indications are that the northern part of Meadow Street and Swan Street formed a T-shaped development which extended into an + shape by the length of the convict deport running south down Meadow Street from the crossroads.

Site-Based Patterning

As stated in Chapter 2, little archaeological research has been funded on early settlement sites in Western Australia reflecting the bias within the Western Australian heritage industry towards listing and conserving standing buildings. In practice, the "intent that there should be compiled a comprehensive register of the heritage" *(*Heritage of Western Australia Act 1990: Part 5, Division 2. Clause 47) of Western Australia has been unintentionally subverted, and an inspection of the Register shows that it has largely become a reflection of the survival rate of Federation and Inter-War building stock (Fig. 3.6). As the bulk of archaeological work carried out within Australia falls within the realm of cultural heritage management, such a situation

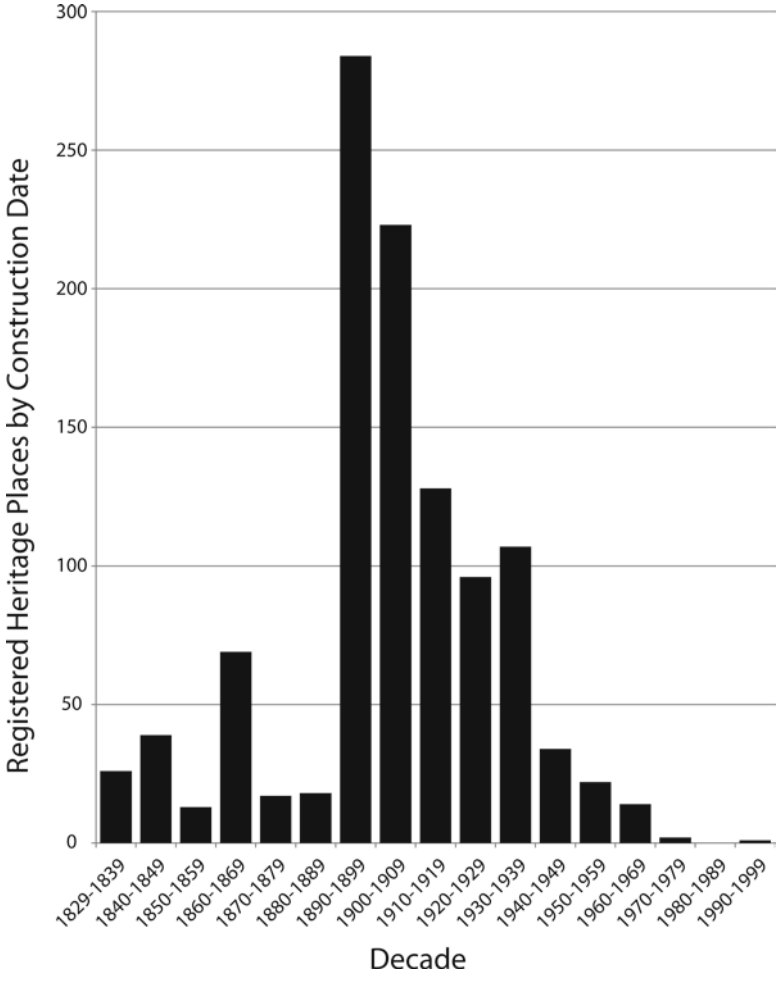

Fig. 3.6 Registered heritage places by date of construction

bodes ill for the archaeological heritage of this state. Indeed, after 18 years of the author working within cultural heritage management in Western Australia, a search through her past excavations revealed only two which sampled 1850s and 1860s household layers.

This bias extends through to archaeological survey work associated with cultural resource management. After over 150 projects by the author, only two surveys were on early settlement sites. During these surveys, aerial analysis and site survey were used to locate ten 1830/1840 farm complexes and a later farm worker/ticket of leave settlement along the Bayswater foreshore (Nayton 2004) and to identify the archaeological features of early farm complexes in and around Pinjarra (Bosworth et al. 1996).

Most of the Bayswater farm complexes were on the Maylands Peninsula, the site of the first successful farming venture in the colony. They belonged to a short-lived group settlement by a group of Wesleyan farmers which quickly became the Tranby Farm operated by just one of the original settlers. Aerial analysis supported by evidence from reticulation trenches identified seven clusters of rectangular foundations of mud brick, unfired clay brick or rammed earth buildings on the brick clay rich peninsula. Four of the clusters were in a mainly linear arrangement with three in an arrangement more suggestive of a group of buildings around a central yard. Neither arrangement had an easily identified homestead that was larger than other structures or on which the patterning clearly centered.

Further up the Swan River, academic-based survey research by Burke, (2004), found 123 features such as fences, irrigation channels, buildings and building sites associated with settlement along the upper Swan River from 1829 to 1860. Utilizing both historic and archaeological survey information, he identified that farm layouts from the 1832–1844 period were generally located on flat ground with timber, earth, rammed earth or composite buildings of rammed earth, low fired brick and ironstone nodules buildings for homestead, workers and outbuildings. The homestead, barn, stables and sheds were arranged around a spacious yard with crops growing on nearby river flats, a pattern he identified as being based on the British mixed farm model (Burke 2004:117).

During the later 1847–1860 period, these mainly timber buildings were replaced by brick buildings arranged so that the smaller workers cottages were placed out of view from the main house and approaches to it. Burke found one elite homestead from this period which was aesthetically modeled on English country farmsteads and was built on a narrow point of land, facing away from the farm work area but with the façade very visible to visitors approaching the house (Burke 2004:334). He found that most of later homesteads faced the river and faced away from work areas.

The evidence suggests a difference between the early (1830–1842) site layout and display on the Maylands Peninsula and the Upper Swan farms. The Upper Swan farms were all identified as being based around a farmyard with one site clearly bigger than other structures other than the barn. The Maylands sites were both clustered and linear with no structures clearly bigger than the others in the cluster. This difference may be one of ideology. The Maylands settlers were all Wesleyans led by the Clarkson and Hardey families. They were a cohesive group

of settlers together with their indentured servants who owned their own piece of the peninsula but nonetheless worked together to settle the area. The indentured servants appear to have been given early opportunity to purchase land within the group's holdings with Marmaduke Hutton owning Chase Farm by 1841, suggesting that social divisions within the original group may not have been as wide and strictly enforced as the religious divide between the group and other settlers. However, Oliver's Farm (Nayton 2004) located outside the Tranby holdings and not part of the Wesleyan group was also linear without any clearly defined larger structure, suggesting that perhaps religion was not the overriding factor at work.

There has been some other archaeological survey work undertaken as part of cultural resource management and archaeological public outreach on later homesteads. All of which were first within their area, therefore, on the fringes of the expanding frontier of their time. The earliest of these is the Pinjarra area which contains archaeological evidence from the mid 1830s to 1840s and archaeological and structural evidence from the mid 1850s (Bosworth et al. 1996).

Historical research and aerial analysis of circa 1835–1842 homestead sites in the region for a poster display by the author indicates a pattern of enclosures with barns and outbuildings in separate enclosures to the homestead and a second pattern of single cottages or in the case of Oakley a 1830s cottage behind an 1841 Inn. John McLarty, an employee of Singleton also built a cottage and obtained an alcoholic license in 1841, which was probably run by one of his sons, as John himself stayed working at Dandalup. Oakley, Bouglas and McLarty all started farming on behalf of other people or leased someone else's land. They were indentured servants, laborers and then small holders rather than elites.

This pattern emerged on one side of the river because Peel owned all the land, and in 1839 Singleton purchased 10,000 acres of Peel's Pinjarra holdings, ensuring the continued influence of elites on land holdings. Singleton established his indentured servants and interested small holders as tenant farmers on small holdings with river frontage within his estate in a system similar to his native Ireland. On the other side of the river, J. Cooper had a substantial holding with a homestead complex of barn in a barnyard, a fenced crop area and an L-shaped homestead outside of the cropped area. Bates had a small holding with a barn close to the river but with two other widely spaced structures well back from the river arranged along his boundary line.

The first large resident landowners in the area were, therefore, Singleton and Cooper. Singleton had brought a number of settlers and servants to Australia with him, and therefore, his farm contained most of the early population of the area and could almost be described as a small village. Historical maps show Singleton's farm by circa 1842 divided into various areas by walls (Bosworth et al. 1996). The homestead and garden are in their own enclosures bounded on three sides by river and on the fourth by a wall. Another wall forms a larger enclosure containing a barn and horse mill within a yard near the boundary furthest from the homestead. The historical plans do not give an indication of where the estate workers who had not taken up small holdings along the Dandalup River lived, but archaeological aerial analysis suggests the location of several structures along the same boundary wall as the barn and mill.

In the 1850s, several large estate homes were built using convict and ticket-of-leave labor. John McLarty purchased land close to Pinjarra and in 1856 built Blythewood in the old colonial Georgian style as a farm, hotel and staging post for the coach service from Albany to Perth. Blythewood is arranged loosely around a large yard with the homestead facing into the yard but located forty meters from the stables at the side of the yard and approximately sixty meters from the blacksmiths forge and workers rooms, which were all part of the same building forming the back of the yard area.

In 1874, his son brought Liveringa on the banks of the Murray River next to the bridge. Liveringa is an old colonial Georgian farmhouse thought to have been built in the mid 1860s and enlarged in 1874 by Edward McLarty. By 1888, after the convict era, Edward built Edenvale, a Victorian Regency style house, twenty-three meters closer to the bridge and within Liveringa's outbuilding area, in fact, incorporating one of the outbuildings as a wing of the house. This, and the location of two extant sheds, suggests Liveringa was also built around a spacious farmyard and faced in towards the farmyard. McLarty run a butchers shop from a building in the yard between Edenvale and Liveringa and a shop out of one of the rooms in the house, and, it is suggested from local knowledge, stabled the coaching horse. His new house clearly functioned as an urban central place rather than a farm, although McLarty also kept up farming interests on other properties.

In 1856, the partnership of Cornish (a brick maker and builder) and Paterson (a shipwright), who together formed a successful wide ranging entrepreneur business, bought Singleton's property. Cornish moved to Dandalup and built a new house called Creaton Hall. The homestead was a long building in the Victorian Regency style, contained twelve rooms facing the road which included an attached store, a gallon license outlet, smoke house and adjacent dairy. There are also the remains of an extremely long line of barns and outbuildings located parallel to the rear of the homestead at a distance of 100 m. Across the estate, the complex included homes for fourteen tenants and labors and a large hotel. It also contained extensive orchards and vineyards and a summer house by the river.

Pinjarra Park was developed in the Victorian colonial style by Theodore Fawcett with imported marble fireplaces, chandeliers and a gilt mirror to reflect the social status of the family within the house (Bosworth et al. 1996). Fawcett had large landholdings in both the Murray and Boddington districts with homesteads in each area. At Pinjarra Park, he established a flour mill, orchards and vineyards from which he produced wine and raisins. The four known Pinjarra Park buildings were arranged in a long line behind the house with the block forming the mill, winding room, hay barn, blacksmiths and workers rooms 54 m to the rear and orientated at right angles to the homestead and other structures with the stables being the closest structure being located ten meters away and slightly to one side.

Research so far indicates a degree of variety within farm layouts across the southwest but there has been insufficient work on a regional basis to delineate regional patterns.

Delineating Southwest Patterns

Our original question for this chapter was "what cultural patterns did market capitalist forces carve into the landscape of the southwest of Western Australia?" The evidence in Chapters 2 and 3 show that the demands of the market capitalist supply and distribution network based on Britain did affect the shape of the production and trading systems and settlement location within the new territory.

Transport networks, land use and the location of central places in Western Australia were clearly set up to efficiently direct regional resources into the British supply and distribution network. Such a pattern has been previously recognized as a dendritic draining pattern focused on supplying an overseas market and furnished with a central place K-4 regional settlement lattice and a K-7 interregional lattice. With a dendritic pattern:

> Peasant-produced goods flow directly from rural areas to urban centers or major ports and in the process leave the domestic or peasant economy poorly serviced and undersupplied. (Smith 1976:34 quoted in Paynter 1982:140)

Kelley (1976) articulates the characteristics of a dendritic system as follows:

- A settlement system demonstrating a colonization gradient
- With a large number of low-level places
- Only one higher-level place
- Drainage of hinterland surpluses through the higher-level place
- Concentration of elites in higher-level towns bordering the frontier

Paynter argues that this pattern "combines the concentrated surplus and unequal transport aspects of the central place transport and administrative principles" (Paynter 1982;140) and that what is described above is in fact the spatial status of lower-order places in $K=4$ and $K=7$ lattices. These are central place lattices which have been identified as being ordered in a way which minimizes transport problems and maximizes the political control of elite's at the heart of the supply and distribution system, which in the Western Australian case are British-based entrepreneurs and political parties.

It is clear that the southwest demonstrated a colonization gradient with towns in the southwest markedly different from towns within Britain offering a similar level of central place functions. Within Britain, southwest towns would not even be viewed as villages with the closest equitable level of settlement being the British hamlet which may be similar in population size but which did not offer similar central place functions. It also had only one higher-level place, the colonial entrepôt of Perth–Fremantle, and elites were concentrated within the entrepôt and the regional frontier towns.

However, while the system is clearly a drainage system which over time became more centralized on the port of Fremantle, even today Fremantle does not handle all Western Australian exports. In a situation where sea transport is vastly cheaper than river or land transport, minimizing transport problems and costs for British-based

entrepreneurs involved draining the colony from several points and avoiding the additional costs of coastal shipping, which was in colonial, not British, hands, resulting in the Rimmer model like pattern of southwest port trade.

Paynter (1982:235) associates dendritic patterns with peripheral areas within a world system of cores, semiperipheries and peripheries (Wallerstein 1980). Paytner (1982: 235) argued that a change from a peripheral area to a more core-like one could be detected by shifts within the regional settlement pattern. These shifts were characterized as follows:

- A shift in the pattern of concentration with increased commercial and industrial activity leading to people, wealth and surplus accumulating at a much higher rate in associated areas.
- The nature of the regional settlement pattern should change from the very convex pattern of the periphery to a less convex pattern.
- A steepening areal land use gradient.

At the end of the study period, southwest Western Australia clearly had a peripheral status and its associated dendritic system. It could be argued that Western Australia has never achieved core status and probably not even semiperipheral status within the world global system. While it is now a rich state, these riches are based on mining royalties to a large extent. Raw materials are removed efficiently from WA by multinational companies who pay only a fraction of their worth to the Australian and state governments. Value adding processes are largely done overseas, and the Western Australian built landscape is still shaped as a drainage system, drained through specialist mineral ports and the central Fremantle–Perth entrepôt.

Once all roads were said to lead to Rome, but in Western Australia they all lead to Perth. Even within the sprawling metropolitan area, which now stretches from the Darling Scarp to Fremantle and a 100 km up and down the coastal plain, all major transport routes lead into the CBD, and it is quicker to go into Perth and out again to get to a neighboring suburb by public transport than to try and cross the suburb. The drainage pattern to the CBD is still extreme and simply grows with the city. That a dendritic system still has a firm grip on Western Australia (WA) can be gleaned from the status of Perth as the city with the largest log normal matrix in the world, meaning WA has one large city where the bulk of the population live and a scattering of towns most of which still would not contain the population of an English village.

The regional pattern for the southwest dendritic system gleaned from the evidence in Chapters 2 and 3 is summarized below as:

- A pattern of colonization which conforms largely to Rimmer's model of hinterland penetration from a series of small ports on river systems with the modification that the system was biased from the start in favor of the Fremantle–Perth entrepôt.
- Rivers and river valleys formed movement corridors, while forests, infertile soils, pockets of indigenous resistance and dangerous sections of coast formed barriers.

- The shape of the new colony was directly affected by cost of transport, which had a direct and measurable impact on land use, trade and where people lived within the colony.
- Land use was based on two distorted sets of Von Thunen rings based on exporting staples from regional ports and supplying the needs of the Fremantle–Perth entrepôt.
- Settlement within river system hinterlands was eventually nested in a k-4 transport pattern, while connections between regions formed a k-7 administration pattern.
- Planned settlements were only successful where they fitted into the embryonic k-4 or k-7 pattern.
- Towns within the region had a low population level but a high level of central place services, the provision of which was linked to hinterland population size, creating a settlement hierarchy of four levels of central places.

Urban patterning within southwest towns followed distinctive patterning which can be summarized as:

- After initial colonization, low-level central place functions coalesced within a focal region rather than a town site. The region was focused on the navigable part of the river.
- The first central place functions to move into a defined town site was the store and hotel, which relocated into the town site on the main transport route connecting the town to the outside world. Religious functions were also an early low-order function.
- Ports developed jetties and simple warehousing along with these first centralizing functions.
- Bid rent relationships affected the placement of retail, non-commercial, industrial and domestic functions from the beginning of the town's development with the main transport route, crossroads and secondary routes settled first with retail functions on the highest bid rent sites. Overall development conformed to Lewis' town development model for inland towns and ports conformed to the early port development shown in the *Anyport* model.
- Development of a non-commercial ribbon development did not occur until a hinterland had sufficient population for level-three services. The placement of this development varied between inland towns and ports.
- Some sorting of the urban population by wealth and status was discernable in higher-level towns.

Chapter 4
The North District: Settlement of the Northwest

The North District: Settlement of the Northwest

By the 1860s, the southwest of Western Australia had developed a pastoral dominant agricultural system, which had spread across the southwest from Geraldton almost to Esperance. Colonization then jumped over 1,200 km up the coast (Fig. 1.1) to a completely new environment in the northwest, one of semidesert and desert conditions, cyclones, monsoonal tropics, and mangrove mud flats with huge tidal ranges.

This chapter introduces the northwest, in particular its geography and history and provides a general framework within which to delineate the geographical spread of colonization within the area and to illustrate the very different environmental conditions faced.

The historical northern district does not coincide with the present-day political or statistical divisions defined by the Western Australian state government. It originally included all the land above the Murchison District and therefore included the northern two thirds of the state. Even within this smaller division of the state, environmental conditions varied from semiarid to desert and through to tropical monsoonal. Conditions are so varied that in the sections below different information is given for the Pilbara and Kimberly regions.

Information of the area geography is taken from the vegetation survey of Western Australia, for the Pilbara (Beard 1975) and Kimberley (Beard 1979).

Climate

The northwest lies within the tropics but the Pilbara is characterized by arid conditions and summer rainfall. Not all of the Pilbara was successfully colonized during the period under study and even today the inland regions remain largely unpopulated. The successfully colonized area contained all the major Pilbara rivers and is classified as semidesert but it is ringed by both the Great Sandy Desert and the Gibson Desert. Average annual rainfall varies from 180 to 300 mm and is delivered mainly through summer cyclones. The cyclones normally form over the sea north

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of Australia but swing southeast to cross the Pilbara coast bringing heavy rainfall and high winds. The temperature range is large with maximum temperatures often reaching as high as 48°C for long periods but with occasional light frosts inland.

The Great Sandy Desert also lies between this core area of the Pilbara and the Kimberley region to the north with the desert reaching the sea in an area known as the Eighty Mile Beach. Above this the Kimberley area is far enough north to be affected by monsoonal activity. Summer rainfall is 400–800 mm per annum delivered by thunderstorms and cyclones. Temperatures are lowest in July and highest just prior to the wet season in September with daily maxima of over 38°C. Humidity is also high during the wet season.

Geology

The area successfully colonized within the Pilbara lies between the sedimentary basins of Carnarvon and the Canning (the Great Sandy Desert) where it consists of the Pilbara block and part of the Western Australian continental shield of Proterozoic and Archean rocks. The Pilbara coast is low-lying and muddy with extreme tidal ranges exposing extensive mud flats at low tide. Large areas of mangrove swamps and marshes exist between the mud flats and dry inland soils, except between Cape Preston and Cape Lambert where Proterozoic rocks form a rocky coastline and off shore islands.

A granite plain lies behind the coast broken by granite tors and dykes of basic or Archean rock. The plain is crossed by the braided flood channels of the Pilbara rivers, which except for occasional pools, are dry for most of the year. The Chichester and Hamersley Ranges terminate the plain and contain the headwaters of the main rivers. Permanent springs in the Millstream Valley are thought to be fed from run-off from the ranges feeding into an aquifer. There are also rugged low mountain ranges that form a belt between the Ashburton Valley and the Gascoyne to the south.

The central Kimberley area also contains rugged high plateaus but the area successfully colonized by the colonization event under study was the western Kimberley centering on the Roebuck Plains in the southwest corner and the Fitzroy River running down from the King Leopold Ranges. The Roebuck Plains area is mostly Quaternary sand plains and alluvium with some rugged outcrops of sandstone and reef limestone. Like the Pilbara the coast is low-lying, muddy, subject to extreme tidal ranges and contains extensive mangrove flats.

Vegetation

The Pilbara coastal fringes are predominantly salt flats, tidal swamps, and coastal sand dunes carrying mangrove as the dominant vegetation. Acacia shrub savanna dominates the granite plain behind the coast with a scattered shrub steppe of spinifex interspersed with widely spaced shrubs. The banks of major watercourses hold woodlands of Eucalyptus and Melaleuca that become more extensive on flood plains

with open plains of grass or mixed grass and spinifex characterizing the alluvial soils. Open grass plains are extensive around Roebourne and the De Grey River.

The Chichester Plateau carries Acacia shrub steppe with grass savanna on the lower areas and the Hamersley Plateau carries tree steppe of Eucalyptus and spinifex with mulga woodland in the valleys and mulga and spinifex on the basalt hills around Tom Price. The Fortescue Valley between the two plateaus has sand plains carrying a spinifex shrub steppe formation, valley plains with Acacia woodland and flood zones of Eucalyptus tree savanna with a cover of grasses. The Stuart Hills between the Ashburton Valley and Onslow is a poor stony country with a sparse shrub steppe of spinifex and Acacia. Completely different from the rest of the Pilbara region is the Millstream oasis which boasts permanent water and is lined with Eucalyptus, Melaleuca, and Acacia and is the only location of the ancient palm *Livistonia alfredii*.

The Roebuck Plains carry tall grass savanna surrounded by an extensive stretch of pindan on the sand plains to the south and east. The peninsula between Roebuck Bay and King Sound carries pindan woodland on sand plains.

Cossack is the port through which the northwest was colonized and the physical environment is different to inland areas. Information on the physical environment of Cossack is taken largely from Lewis (1984) and Carey (1878).

The town site is situated on a peninsula at Butcher Inlet, the estuary of the Harding River and is located on a low-lying coastal flat containing some coastal dunes and outcrops of basalt rocks. These outcrops form Nanny Goat Hill, Long Hill, Mount Beach, and Reader's Head. At the high tide mark a lime cemented beach conglomerate, commonly called beach stone, occurs along the northeastern part of Butcher Inlet. The coastal flat consists of an older buff colored shell rich sand covered with grasses and shrubs and a younger white shell rich sand that forms the present beach and sand dunes.

The town site is surrounded by tidal mud flats, Samphire flats, and tidal mangrove swamps. Lewis believed that the mangroves were foreign to the area and had colonized Butcher Inlet since the town was abandoned. This was due to former resident Chris Thompson's (n.d.) claim that the mangroves did not exist along the Cossack beach during the heyday of the town. While the mangroves may have been cut back during the period of Thompson's childhood the earliest historical map of the area shows them occupying the same locations as the present day (Fig. 4.1).

The inlet is generally shallow, fringed with mangroves, and with extensive mud flats exposed at low tide. A small deep pool of water exists on the southeastern side of the inlet. The mouth of the channel is guarded by Jarman Island, which protects the channel from northeast winds and swell.

Land Regulations

The land regulations current in the southwest were applied to the northwest with some important modifications. The northwest was divided into Class A and C lands. Class A land included the coast and all the islands as well as permanent

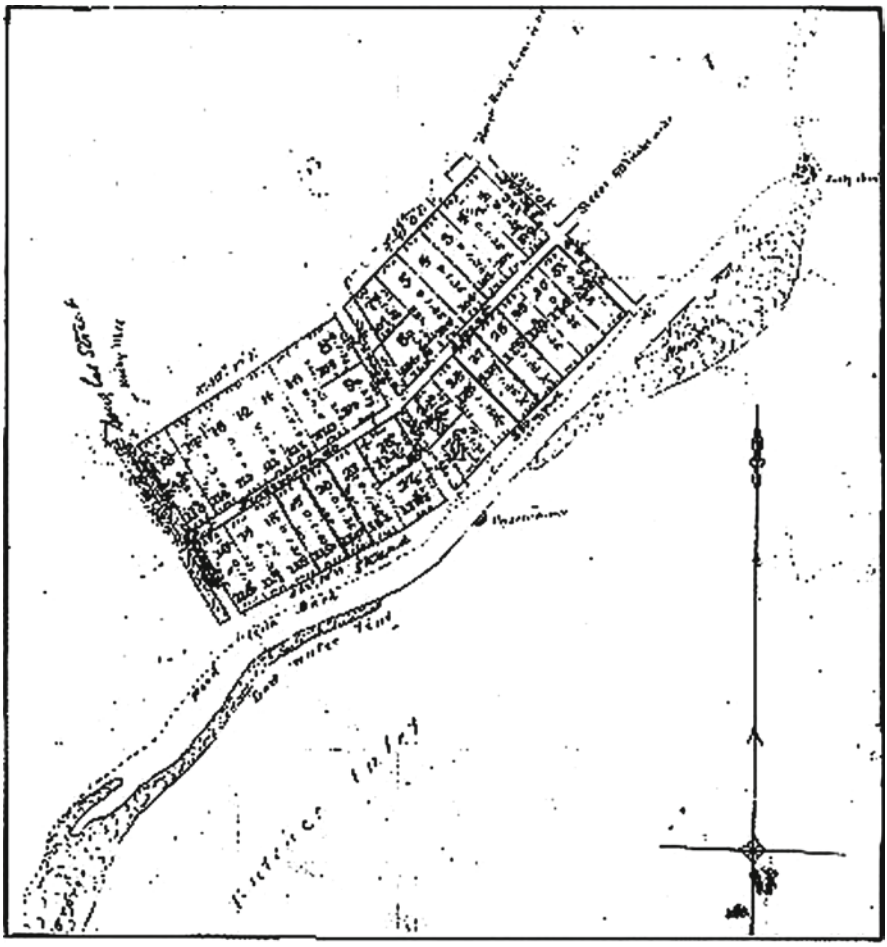

Fig. 4.1 Suburban Roebourne (Cossack) 1870. *Source*: Taylor (1870)

waterholes and land around towns. It could be leased for 1 year in the same manner as Class A land in the Southwest.

The rest of the land was classed as C. This could be held on a pastoral lease of up to 100,000 acres in 20,000-acre blocks for 8 years. Free pasturage was given for a year allowing the settler to move his stock to the northwest before selecting a suitable lease. Once the lease was selected it was rent-free for the first 3 years giving a total of 4 years free grazing for the colonists to establish themselves (De La Rue 1979:11; Withnell-Taylor 1987:22). After this period the land was leased in 8 year leases in the same manner as Class B lands in the southwest.

Tillage leases operated in the same way as in the southwest except that during the free occupation of a run and the first year of a lease the colonists had the right to cultivate without a tillage lease (Sturkey 1957, Appendix A).

Area History

Settlement of the northwest began after favorable reports by the Gregory expedition in 1861. The government allowed 4 free years of stock grazing and 2 years of cultivation to settlers of the new North District. The first to take up land in the northwest was Walter Padbury who leased land near the De Grey River. The cutter *Mystery* was sent ahead to find a suitable landing place, however Breaker Inlet and what is now Port Hedland were deemed unsuitable for landing stock. Hearson's Cove was also ruled out due to difficulties encountered by Gregory when landing his horses. Sailing north from Hearson's Cove, Captain Hedland decided to stop at the first decent landing place they found north of Nichol Bay that was close to known water. Butcher Inlet at the mouth of the Harding River was found and the barque *Tien-Tsin* landed Padbury's stock there in April 1863. Padbury's brother-in-law and station manager Charlie Nairn first moved the stock 20 km inland to the Harding River pools, then eventually overland to a pastoral run at the De Grey River chosen before they had left Perth. This pattern of landing in Butcher Inlet, moving to the Harding River, than spreading out to other parts of the new frontier was followed by most of the settlers who came after this first flock.

Butcher Inlet was used as a landing place for people and stock from Padbury's first landing, but the first permanent occupation of the future town site was not until 1867. Some temporary occupation did occur. Shakespeare Hall, John Wellard's stock manager, built a temporary stockman's hut there in 1863 while he explored the area for a safe route through the marshes and a good permanent camp on Wellard's Harding River lease. The temporary hut was removed to the lease once the flock had been taken there (Hall 1865).

John Wellard was the second Swan River entrepreneur to take up land. His manager Shakespeare Hall, like Nairn, had been a member of Gregory's expedition and so had seen the country before. Wellard came with Hall to view the land before returning to Perth and selecting land around one of Gregory's camping sites on the Harding River.

The first woman in the northwest arrived with her husband in April 1864. Shakespeare Hall helped get the Withnells and their sheep to water and the woman and children stayed with him until the men had settled in and built a place for them at the Mt Welcome station (Roebourne). This type of help and hospitality became very much a part of northwest culture. Emma Whitnell herself became known as the "Mother of the North West" through her own hospitality towards fellow settlers (Withnell-Taylor 1987) and the centrality of her homestead on the Harding River pools.

These early pioneers brought white labor with them but their work force soon expanded to include Aboriginal labor. Such labor cost half the food rations of white labor with no additional moneyed wages and it became the mainstay of the pastoral industry.

The year 1864 also saw some settlement in Shark Bay and the Murchison. A. and K. Brown took up occupation leases in Freycenet Harbour, Shark Bay, and Von Bibra settled on the Murchison (Pastoral and Tillage Lease Book: 15) where he was the only settler for a long time as the Murchison was not included in the generous new land regulations.

The Camden Harbor Association also settled Camden Harbor in the Kimberleys, in 1864. This association was formed in Melbourne and consisted of many small shareholders who leased the land from the association. The choice of site was governed by a convict's report of gold and grasslands in the area rather then by informed knowledge and the area proved unsuitable for the new colonists. Many people and most of their stock died; a large proportion of the small shareholders could not afford passage home and the government had to step in and rescue them.

The Roebuck Bay Pastoral and Agricultural Association, which was organized along the same lines as the Camden Harbor Association was formed at Swan River in 1864. They took up land around the future site of Broome. This venture also failed but settlement lasted until 1866 when Shakespeare Hall brought the last of the stock back to Roebourne.

The third large group settlement was the Denison Plains Association, which settled Nichol Bay in 1865 after having been warned about the Camden Harbor disaster. Being closer to other settlers did not save this venture from failure and most of its people had left the area by 1866.

The rush of settlement in the northwest prompted the government to send a representative to the area. However, Government Resident Sholl was not sent to the Harding River but to Camden Harbor. On arrival Sholl disbanded the settlement and helped many of the settlers leave the northwest, although some only moved as far as the Harding area and these stayers, along with others from the Roebuck and Denison Plains associations, became important to the history of the northwest. Sholl himself moved to Roebourne in 1865, which began to coalesce into a town after his arrival.

The early pioneers had to absorb high stock losses from the sea voyage, which were then increased by landing weakened stock on a waterless beach with 12 miles of salt marsh to negotiate before water was reached. Fresh water had still not been found by 24/1/1866 when Treverton Sholl records John Withnell sinking a stock well at the landing only to find saltwater (Sholl 1866). Under these conditions it is not surprising that the feasibility of an overland stock route was investigated and that E.T. Hooley was treated as a hero after he successfully opened up an overland route in 1866 (Sholl 1866). Freshwater was eventually found at the port allowing urban settlement of the area to start.

Early colonization attempts at Camden Harbor, Roebuck Bay, the De Grey River, and the Ashburton River were unsuccessful and the colonized area contracted back to the Fortescue, Maitland, Harding, and Sherlock rivers (Fig. 4.2). The De Grey and Ashburton rivers were later successfully recolonized by pastoralists. The sparse settlement at the De Grey can be considered as the fringe of the original colonization area as only one pastoralist settled there, and while this pastoralist later withdrew he was replaced by another after a break of only a few years. The Ashburton settlement however, was not attempted until 1866 and abandoned soon afterwards. The re-colonization of the area by a fresh wave of pastoralists in 1879 can therefore be considered the first move out of the original area of successful settlement.

A pearling industry started in 1869 at Cossack and began to move northwards and southwards as the pearl beds near the town became depleted while Broome started as a resting place for the pearlers working in the northern pearl beds. Beagle Bay and the Fitzroy River were explored in 1879, with the first settlers moving back

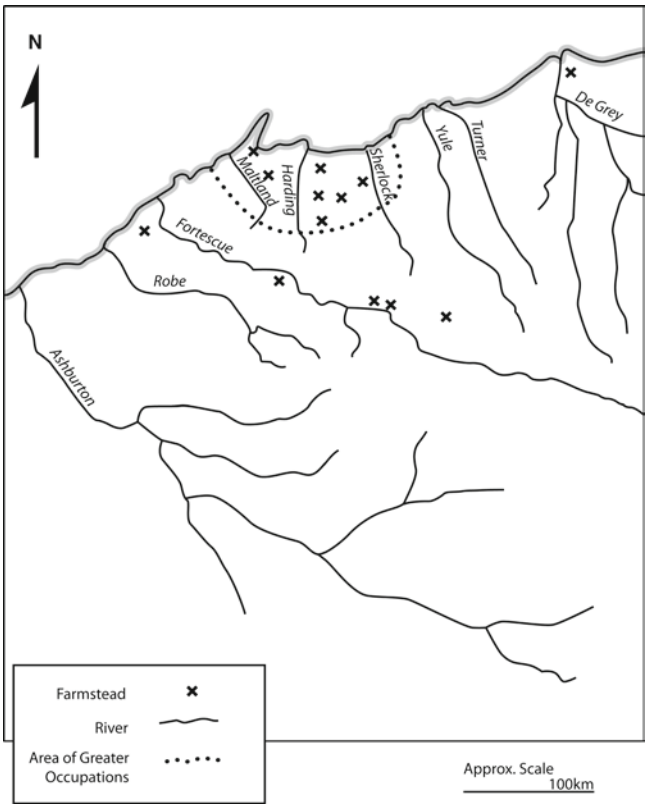

Fig. 4.2 Pastoral areas settled by 1868

into the Broome area in 1881 and the Fitzroy being settled soon after. In 1883, Broome and Derby were named and surveyed and the steamer service extended to Beagle Bay. The new port of Broome soon became Cossack's first serious rival.

The Ashburton area also had pearlshell beds along the coast and off the many small islands and within Exmouth Gulf. These southern pearl beds were being exploited when pastoralists recolonized the area in 1879 and in 1883 the occupation of the township of Onslow was started with a store and nearby owners house.

Carnarvon at the mouth of the Gascoyne River was also declared in 1883 to service a rapidly growing pastoral industry. Some settlement of the area began in 1867 with the arrival of the Morrissey's and the Mongers (Pastoral and Tillage Lease Book: 19) and by 1891 the area was the first part of the original north district excised and administered separately.

The Gascoyne sits between the 1870 extent of the southwest settlement at Geraldton and the 1879 extension of the northwest frontier into the Ashburton. Both the Gascoyne pastoral industry and the population origins were very similar to the north district. The pastoral industry was dominated by sheep with secondary trade in cattle and horses (Fig. 4.3), while the population statistics (Fig. 4.4) contain

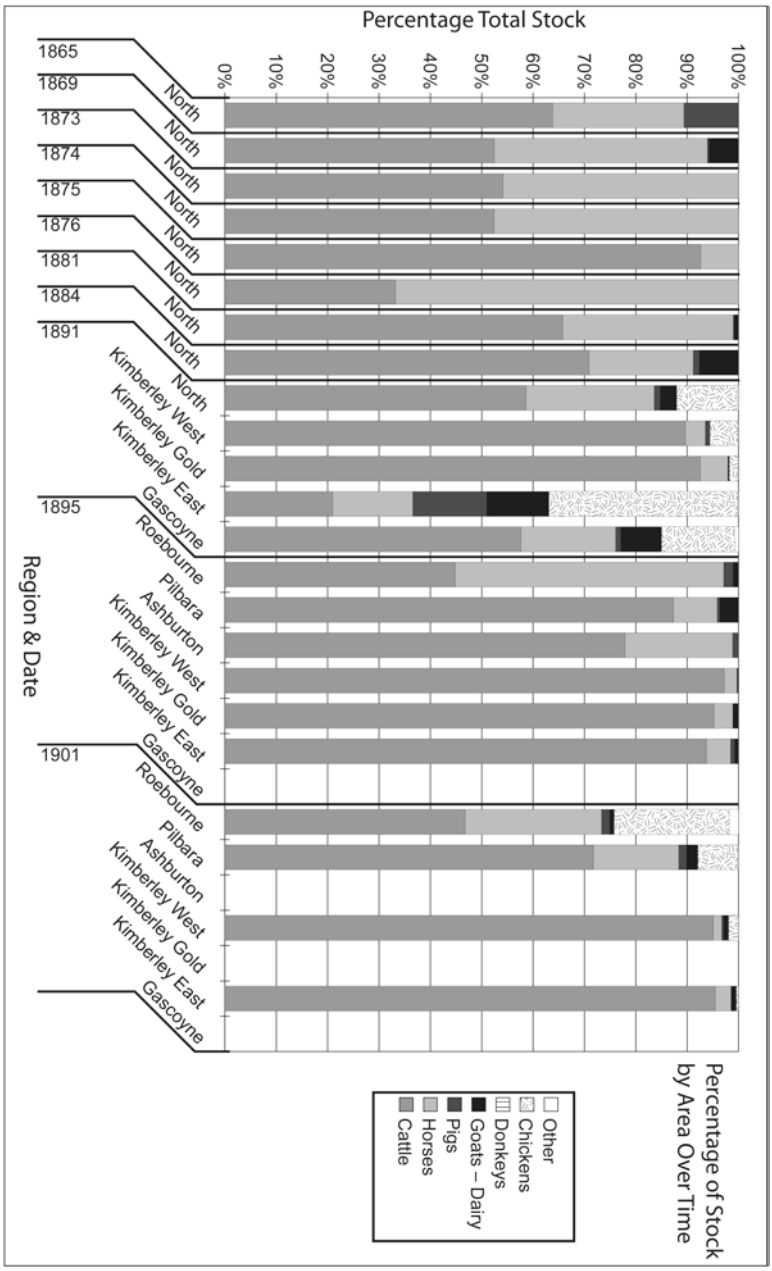

Fig 4.3 Percentage stock by area

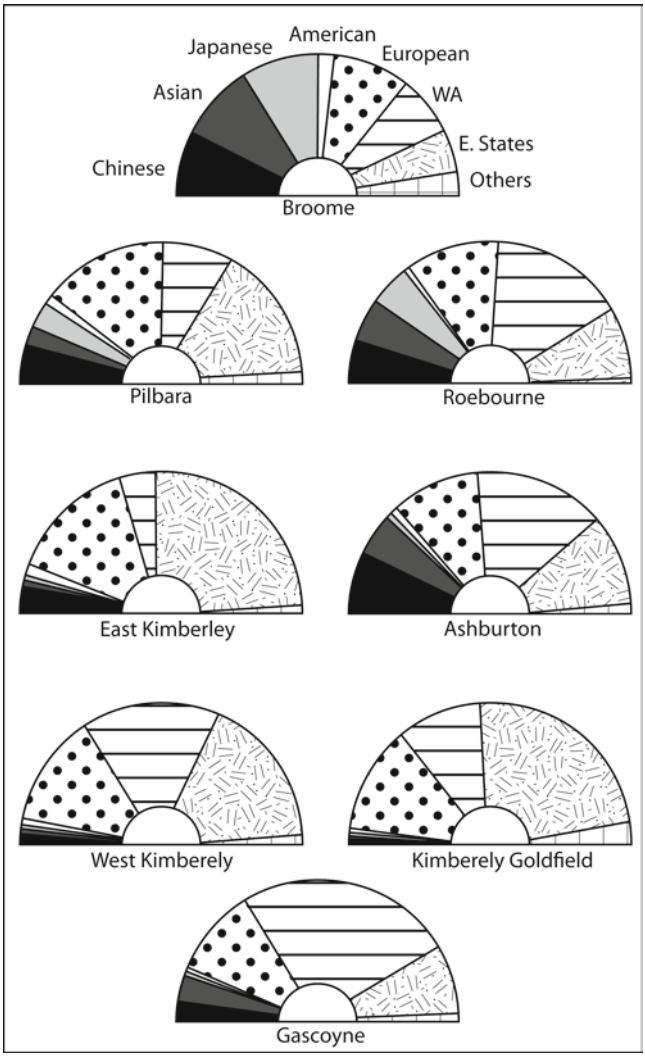

Fig 4.4 Population origin by area

about the same percentages of people from the eastern states of Australia and Europe. However, the Gascoyne profile is different by having a larger percentage of WA-born people and less Asiatic people, who were largely associated with the northern pearling industry, and by having slightly less variety in the pastoral industry, traits it shared with the southwest. The region appears to have been one where the northwest and southwest colonization events overlapped slightly but the northwest pattern was dominant.

The Kimberley goldfields were discovered in 1884 with miners coming into the goldfields through Derby and Wyndham. The area around Wyndham, however, was

first colonized from the eastern seaboard of Australia not Western Australia. The extent of what was essentially a Queensland frontier can be seen by comparing the 1891 Kimberley population and stock profiles to those from the North district and the Gascoyne (Figs. 4.3 and 4.4). Both the Kimberley Goldfields and Kimberley East profiles are markedly different from the North district and the Gascoyne. They had large percentages of people from eastern Australia with relatively low percentages of Western Australians. The West Kimberley also had a high percentage of people born in eastern Australia, but it had almost as many West Australians. This same mixing can be seem in the stock records with the Kimberley East and Kimberley Goldfields industries being dominated by cattle and the West Kimberleys having a larger percentage of cattle than other Northwest areas.

The second Western Australian colonization event therefore can be characterized as a tropical but semidesert frontier which started at the Harding River in 1863 and spread southwards to meet and marginally mix with the southwest colonization event in the Carnarvon region. Northwards it spread into the West Kimberley region where it mixed with a Queensland-based colonization wave moving overland across Australia's north.

Colonists' Expectations

The Swan River colonists brought to Australia a mixed farming regime familiar to them from their British homeland. In settling the southern regions of Australia they learnt hard lessons, and in the southwest the mixed farming regime became pastoral dominant. In Victoria it changed to a system of large sheep runs with large flocks kept in permanent folds on land outside of the officially released area. Such runs were called squatters runs as they squatted on land which they did not own or lease.

The first colonists in the North district knew very little about this new region yet they arrived prepared to farm and settle. They would have based their decisions on the best way to go about this on what was known about the land and on what they had learnt from their parents experiences. These factors would have influenced the skills, knowledge, and equipment chosen to be taken to the new area and their decisions on suitable land uses and the ideal social system to support that land use.

Prior Knowledge

The first colonists arrived in the northwest in 1863 following Francis T. Gregory's exploratory expedition in 1861. In 1860 manufacturers in the British textile industry pressured their government to sanction settlement in the northwest. According to environmental theories current at the time, they expected this area to be ideal for cotton plantations, which would provide a source of supply, not threatened by the American Civil War. Hence, both the British Government and the Western Australian Colonial Government financed the Gregory's 1861 expedition (De La Rue 1979:6).

Table 4.1 Hall's diary comments on land during Gregory's expedition to the northwest

Hearson Cove	Sandy cove, rocky hills, two miles of salt marsh. Extensive plains beyond with feed in patches by watercourse
Maitland	Fine pool, plenty of good grass, large plains with rocky ranges beyond
Fortescue	Large watercourse 150 yd wide, river dry, traveled up riverbed, hills too rocky for travel. Tall trees and some grass on river. Near large tributary from south water and fine land more frequent. Southwest branch better than this one
Millstream	Plain at foot of Hamersley Ranges has excellent soil with good feed on the ranges. River is a fine stream with extraordinary palms; bucketful's of fish and fine soil
Chichester Downs	Lains gave out. Found wild plums and melons. Ground steep, no water, some isolated good grazing
Sherlock River	River large with extensive pool, lots wild fowl, fish, and a new type of nut tree. Extensive grassy plains but stony
Harding Camp 49	(12 miles up river from Harding Pool) – On river considerable size, one branch leads up river to granite pool
Harding Pool	(Near mouth of river) – Large pool, abundant wildlife
Yule River	Round large pool, country beyond Sherlock generally poor
De Grey	Finest river in these parts, luxuriant feed, and wildlife. Extensive loam plains with fine grass before and in delta
Oakover River	(Tributary of De Grey) – Plenty of feed and water. Good country, plenty of pools, and good feed. Bad sandy country beyond turned back
Shaw River	(Tributary of De Grey) – Still good country with extensive feed and water

Previous knowledge of the northwest, confined to the coast and islands, had given an overall impression of barrenness; Gregory went inland finding all the major Pilbara rivers. Shakespeare Hall was a member of Gregory's party and his diary records where they found good soils, freshwater, grass, and game, and conversely where the country was poor (Table 4.1). This knowledge was available to colonists both through talking to expedition members and through Gregory's published journal. Gregory's experience and opinions of the northwest country, summarized below, was the only guide, apart from talking to expedition members, on which the early settlers could base their expectations.

Gregory's Opinions

Aboriginals: Not warlike and should not prove particularly troublesome. They are not numerous and appear willing to take employment under Europeans.
Country: 3,000,000 acres good grazing land and 200,000 acres of agricultural land.
Rivers: All fresh with a lot of fish. Some lined with bamboos, mangoes, wild fig, plums, and date trees. The Fortesque also had palm trees at Millstream.
Game: Plentiful kangaroos, emus, ducks, pigeons, and Cockatoos.

Minerals: Only iron, no gold, and coal is unlikely.
Harbors: Nickol Bay and Rosemary Island anchorage second only to King George Sound (Albany) which was the best harbor in the colony. Tides averaged 16 ft but went up to 21 ft.
Climate: Mostly fine during the 5 months with two showers of rain. Temperatures varied between 54 and 92°F.
Natural production: Pearling. Found beds of pearl oysters in Nichol Bay with easily gathered and valuable pearlshell and some pearls.
Sandalwood: Present but highly scattered.
Tobacco: Grows in small quantities. The Aboriginals chewed it.
Flowers: Many new and beautiful flowers for natural history collections.
Wool: Not considered a good country for wool, as it was inter-tropical. Agriculture. Wheat and barley could be grown.
Cotton: Most of the agricultural land suitable for cotton.
Source: Modified from Withnell-Taylor (1987):16–22.

Northwest colonists came from both the Swan River colony and Victoria. The Victorians were familiar with large squatting runs. Their large shepherded flocks were kept in permanent folds on land outside the official boundary of settled lands on ground they did not own or lease. In the Southwest, the land management system concentrated on wool, wheat, and meat with small shepherded flocks moved around and kept in temporary folds.

Most colonists did not have first-hand knowledge of the northwest before their actual settlement attempt. However, both the absentee owners of the first two stations in the northwest, used members of Gregory's expedition, Nairn and Hall as managers but even these two men paid less heed to Gregory's recommendations for the region than to their prior experience as farmers in the southwest. They both, for instance, took sheep to the north and kept them in temporary folds, which were moved around the run in a systematic way.

Initial Northwest Land Use

Government papers and settlers' diaries can be used to establish what colonists took to the northwest. Information contained in the early colonial Blue Book returns is sketchy and only deals with totals for the entire region. However, colonists had to fulfill government stock requirements to obtain occupation leases; therefore, there is a traceable record of northwest stock and the number of men at individual stations (Legislative Council 1863–1867; Pastoral and Tillage Lease Books 15–19).

The occupation lease data for the first 6 years of settlement confirms that sheep-dominated pastoralism was taken to the northwest. The sheep percentage of total stock on any station (except Miller's) never fell below 92%. During this period 56 occupation leases and 1 tillage lease were taken out, and the overall picture presented by the lease information is that most stations were

sheep-oriented with horses used as transport. Some stations had cattle that would have been intended to form a supplementary economic role similar to the position they held in the southwest. Only one small station did not have sheep and instead invested in cattle and horses.

The lease information does not however, give a complete picture. In addition to sheep, cattle, dairy cows, and horses, the colonial Blue Book for 1865 records 50 pigs. Comparing the lease information with settler's diaries also shows discrepancies. Since partners could each claim a lease and some claimed more than one as they moved from area to area, often only the minimum requirements were recorded. In fact, 34 of 56 leases claimed to have had exactly 200 sheep (the minimum requirement), and 28 of those recorded no horses to work the sheep or provide transport. It was realized at the time that the regulations were being abused, resulting in Resident Magistrate Sholl complaining to Perth (Sturkey 1957:11).

Additional information does not exist for all the pioneer stations. However, the managers of the first two established stations kept diaries (Hall 1865; Nairn 1863–1864), and family records exist for the third (Withnell-Taylor 1987). Letters home (McRae family letters, Stewart family letters) often also mentioned the arrival of new people and their stock, and some pioneers lived to write memoirs (Richardson 1914).

It is clear from extracts of these more personal records that most pioneers tried to start a kitchen garden where vegetables such as cabbage, radish, pumpkins, beans, lettuce, peas, turnips, carrots, and potatoes were grown for home consumption. Experimentation in this area continued with different vegetables including watermelons and tropical vegetables being tried at Millstream station (McRae 1869). The kitchen garden was also the place where possible cultigens were first tried out. Nairn tried growing tobacco, maize, and holeus in his garden with an eye to the future growing of crops (Nairn 1863), and McRae trialed cotton (McRae 1869) after he became established at Millstream Station.

The early station manager's methods varied widely in what they attempted to establish. Withnell tried to take the same system, minus the pigs, that he was used to on his southwest farm, see below.

Withnell's Northwest Outfit
10 tons flour
12 month sugar supply
12 month stores supply
Firearms
Tools
Farming machinery including plough
Seed wheat and maize
Harness
Household requirements
Boots
Timber

Clothing
Reading materials
Toys
Medicine chest
650 sheep
Drought horses
One saddle horse
Cows
Clydesdale stallion
Poultry
Sheep dogs

Source: Modified from Withnell-Taylor (1987):33.

He also took seed wheat and maize with him although he gave them to Shakespeare Hall in return for Hall's help with stock losses (Hall 1864). In addition to this rather opportunistic planting of these familiar cultigens, Hall, who did not bring either ploughs or cultigens to the frontier, tried a mixed stock regime with sheep, cattle (6% of stock including draft bullocks and milk cows), and pigs. Dairy farming and pigs were both important within his system. Hall had churns to make butter, and he constructed a dairy before building his permanent kitchen and soon after built a pigsty (Hall 1863). Nairn also had pigs but they roamed free to raid his garden where he trialed exotic crops such as tobacco and maize (Nairn 1864). Otherwise he focused on sheep-dominated mixed farming.

In summary, Nairn and Withnell attempted to establish a sheep-dominated mixed farming regime similar to that in the Avon Valley, although Nairn also experimented with some exotic crops thought to suit the climate. Hall tried to establish a stock regime similar to that in the Murray and Bunbury regions, but he was willing to experiment with cultivation when the opportunity arose. Neither Withnell nor the two members of Gregory's expedition experimented with cotton, even though Gregory had strongly recommended it, and the colonial government was offering seeds at low prices (Government Gazette 1863). The only mention of cotton experimentation was that of former Victorian Alex McRae in 1869 after he settled at Millstream station, the only station in the Pilbara with abundant perennial water.

Other colonists, many of whom arrived as part of land associations, closely followed the first three groups of colonists to the northwest. The associations brought both people and stock to the frontier. There is some weak evidence of embryonic intentions to cultivate. The only large land association formed in the southwest was The Roebuck Bay Pastoral and Agricultural Association, which included the word "Agricultural" in its name. However, only the shipment of stock, which shows a heavy emphasis on sheep, can be traced in the historical documentation (Pastoral and Tillage Lease Books 15–19).

From its prospectus, Victoria's "Camden Harbour Pastoral Association" may also have had tentative plans to cultivate as they intended to "settle the very superior well-watered pastoral and agricultural country around Camden Harbour" (Withnell-Taylor 1987:55). The settlers took machinery with them, but whether agricultural

or not is not identified (Sholl 1866). What is clear is that wool was obviously intended as a staple as the stock landed by the *Calliance* and *Helvetia* included 4,500 pure merino ewes bred for their wool (Withnell-Taylor 1987:57).

The intention of other associations formed in Victoria to focus on sheep is clear. The Denison Plains Association landed 2,100 sheep but took only 40 horses and 17 head of cattle. The seven partners within the Portland Squatting Company took 1,600 ewes and eight horses to the northwest with the explicit intention of setting up a sheep station based on Victorian models (Richardson 1914:9). Cultivation of any sort, except the planting of a kitchen garden, was never mooted. From Richardson's (1914) scattered accounts of his neighbor Mr. Mount, Mount's party also intended a sheep station based on the Victorian model.

There were clear differences between the sheep brought to the northwest by Victorians and those by the West Australians. The Victorian sheep were smaller, less hardy, and contained a large proportion of pure and nearly pure merinos, bred for the quality of their wool. In contrast the southwest colonists brought along sheep that had been bred to provide the biggest carcass combined with the best coat possible. Both parties had alternative options, as the Western Australians could have chosen wool sheep from among those still in the southwest, or purchased them from South Australia or Victoria, while the Victorians could have purchased West Australian sheep in Fremantle.

The type of sheep taken shows the expected staple. The Victorians intended selling fine wool on the London market, while the West Australians intended selling coarser wool to London, and selling meat to the established southwest market and to a smaller northwest market whose establishment they anticipated following colonization. Possibly they were also thinking of markets in India and Southeast Asia, which were relatively close to the northwest.

Flocks in the northwest were clearly smaller than those in the southwest or Victoria at that time. Initial size was largely determined by the government's minimum stocking requirements. Seven of the first eight individual settlers in the Pilbara had flocks of more than 300 but between 1865 and 1867 few individual settlers appear to have taken more than the 200. Where origins can be identified most of these settlers were from the southwest and came as individuals rather than with associations, whereas Victorians appear to have largely arrived in organized groups.

The southwest practice of separating flocks into several functional groups such as breeding flocks, studs, and wethers appears not to have been used on the first stations. Instead, stock was divided into species with horses, cattle, and sheep being kept on separate runs (Hall 1865; Nairn 1863). During lambing and shearing sheep were brought closer to the homestead, and put into stable folds but they were otherwise shepherded in temporary folds across the run.

Horses and cattle were grazed in herds under the care of a permanent drover. These herds appear not to have been divided according to the multiple functions they served, as would have been the practice in the southwest. Cattle herds were a mixture of dairy cows, working bullocks, bullocks for meat, and stud bulls. Horses were kept closer to the homestead to be available as saddle horses and to pull drays.

Their uses are consistent with practices in the southwest, so the difference in stock handling may be attributable to the small number of available drovers rather than to an intention to use the stock in a different manner.

The material culture taken to the northwest should, to a large extent, reflect the colonist's plans. Articles needed for subsistence and pastoralism, with less investment in agricultural items, and no items of a manufacturing nature should therefore have dominated it. Information on material culture in the historical records is scanty and leaves one arguing mainly on the basis of the broad picture, i.e., the colonists must have brought essential equipment for their kitchen gardens and pastoralism, as they set up stations and most apparently tried to start up a garden. The early colonists must also have brought the means to defend themselves, hunt for food, and fish, as there are scattered accounts of individuals engaging in these activities. Hunting and fishing seems to have usefully combined necessity and leisure (Sholl 1866).

The information contained in historical sources is sufficient to establish with reasonable clarity the land use systems the early colonists intended to establish. Arguably then, archeological research in this area might be largely restricted to confirming information gained through historical research. However, archeological research could throw a clearer light on any intentions to cultivate or to manufacture. Because such intentions, if they existed, never crystallized into production systems, therefore historical information may be inadequately representing expectations as opposed to eventual realities.

The Initial Northwest Social System

It is quite clear that the new colonists did not intend setting up cotton and tobacco plantations despite popular theories about environmental suitability and Gregory's recommendations for the area. The Victorians tried to establish fine wool sheep runs and the West Australians, pastoral-dominated mixed farming. Both groups intended to create a largely pastoral landscape of large stations focused around the homestead with pastoralists forming the social elite. This intention would have affected the material culture and social distinctions brought to the frontier.

Northwest settlers were prevented by law from taking convicts or ticket of leave men to the north, removing that source of cheap labor so useful in the south. Colonists therefore had to rely on their own or hired (white) labor. The first settlers also had one or two Swan River Aboriginals with them as trackers and interpreters (even though the Nyungar people did not speak the same language as the northwest groups).

The occupation leases record the manpower on each lease. The information is confined to males, women's presence as part of the work force is not recorded. The picture is somewhat clouded because partners took out different leases which they worked simultaneously, resulting in an overestimation as they cited their total manpower as if it were available at each lease.

However, manpower at the stations opened in 1863 was generally higher than at later stations. Both Nairn and Hall, who were managers for absentee owners,

oversaw several men. Hall appears to have started with a shepherd, a cattle drover, a horse drover, a bullock teamster, a carpenter, and a general laborer, although the last three did general laboring as needed (Hall 1865). Nairn was not as specific about his laborers but he did have two full-time shepherds (Nairn 1863).

Although Nairn, Hall, and Withnell worked alongside their men, levels of status within the work force are identifiable. Managers and owners visited the runs where the stock was kept but did not live on them as the shepherds and drovers did. In addition, owners and managers lived in separate buildings from the men on the station (Withnell-Taylor 1987:41; Hall 1864; Nairn 1863). The homestead was erected first, as the dwelling place for the owner or manager, and was then followed by stockyards and folds, and a shed for stores. Permanent accommodation for the workers appears to have been a long way down the list.

Status is also visible in wages, which were high for the time, with the managers being the most highly paid. Withnell paid his men 25–30 shillings a month with rations and Wellard's men were paid £ 3 a month plus rations (Withnell-Taylor 1987:51). The workers were paid different amounts, depending on their skills. Green as a shepherd was paid more than Laing who was a laborer (Hall 1864), giving the skilled worker status. Swan River Aborigines and the local Aboriginal people, once they were incorporated into the system, were only paid in kind, receiving half rations (McRae 1869).

Withnell's party consisted of his wife and children, his brother, his wife's brother, and three male servants who helped build the homestead and tended to the stock (Withnell-Taylor 1987:33). Two to four men appear to be the general number of workers on most stations, but this could include the owner or partners, as with the Portland Squatting Association which recorded seven men, five of whom were partners. The large associations appear to have been a little different. Sholl reporting that the people of Camden Bay were all equal as shareholders – "there are no servants, everyone is master" (cited Withnell-Taylor 1987:59) – saw this as one reason for their failure. The Denison Plains Association also consisted mostly of members, although they did have some hired help.

The diary of Treverton Sholl (1866) indicates who was deemed respectable enough to associate with the Resident Magistrate and his son. They dined and otherwise socialized with the masters of passing ships, settlers with professional qualifications such as doctors, the more prominent settlers such as Broadhurst and Hall who managed several laborers, or who had families. Ex-Camden Harbour Association members, such as Alex McRae, also qualified as a "better class of men" (R.J. Sholl, cited in Withnell-Taylor 1987:59). They did not associate with hired help whether station hands, sailors, government labourers, police constables or pensioner guards, nor with Swan River Aboriginals such as Sholl's personal servants, whose duties were to cook, clean, and run messages.

The above historical information suggests that the social systems supporting the two land use systems were a little different. The Victorians intended running their stations with large groups of partners or family members, along with some hired help. There were status differences between senior and junior partners or between managers and normal shareholders in the large associations, while hired help was a

position of lower status. However, junior partners or normal shareholders were respectable enough to associate with the Resident Magistrate and his son.

The West Australian system had more tiers starting with absentee owners who could afford to own stations in both the northwest and the southwest. Below them, owners who worked their northwest stations and station managers for absentee landlords were on a similar footing. Further down were graded levels of hired help ending in the Swan River Aboriginal servants who were paid only rations.

The material culture found at the homesteads therefore should reflect the desire of the owners and managers to establish themselves as pastoral elite. Information on domestic material culture is more or less restricted to snippets of information concerning Emma Withnell's household. The following extract details Emma's reaction to the news that the Denison Plains Association had landed women and children. It shows that not only did the homestead material culture include some luxury items but, more importantly, status signifiers were carefully stored to be brought out only when needed to establish social status.

> Hurriedly unpacking a tin trunk, out came her best green silk crinoline and lace collar, so carefully packed for some special occasion. Out came the children's best clothes. The flat irons were put upon the stove. Her precious china tea set and silver teapot, with the warmer beneath, was [sic] set upon the beautifully hand embroidered tea cloth which belonged to her glory box. The teaspoons and teapot were polished until they reflected her gaiety. Baking was done, the house tidied, and table set. Her excitement was almost uncontrollable as she sat in John's old worn and faded armchair, of which she was utterly ashamed, and waited for ages and ages (Withnell-Taylor 1987:73).

The poignancy of this description cannot compensate for the total lack of context that other relevant records would provide. Clearly homestead material culture is an area where archeological research can make a significant contribution.

Chapter 5
Northwest Adaptations

If the patterns delineated at the end of Chapter 3 are the patterns market capitalism carved into the southwest then the question arises; how would these patterns be affected by being translated to the tropical but arid northwest?

In the southwest, a dendritic pattern emerged based on the regional ports and the entrepôt with a weak zonation of towns, people, wealth, and surplus based on them. A similar dendritic pattern is likely to have also emerged in the northwest and would not have changed unless the region achieved a shift to a more core-like pattern. But given Casagrande's et al. (1964) concept of the colonization gradient which states that settlements will vary in complexity and similarity to the metropolitan area according to their distance from the focus it is conceivable that the system, particularly initially, would be more extreme.

Northwest Adaptations

Settlement of the northwest initiated a rapid process of learning which quickly affected the expectations of later colonists. The early settlers suffered huge stock losses; the Camden Harbor Association's foray into the Kimberley resulted in the financial ruin of most involved when the land proved to be unsuitable. Pilbara settlers also suffered, the Roebuck Bay Association lost half of their original flock and Withnell nearly all of his on the sea voyage, while Nairn and others lost stock to the sea marshes. News of these losses had reached Perth by early 1865 and prospective settlers were told of them. The losses resulted in caution, with establishment flocks becoming smaller after 1864 (Pastoral and Tillage Lease Books 15–19).

A revision of ideas about which parts of the northwest were suitable for settlement is also visible. The Denison Plains Association changed their intention to settle in the Kimberleys after hearing about the fate of the Camden Harbor Association, choosing instead to settle close to the more successful Harding River settlement (Withnell-Taylor 1987:72). Settlement of the Kimberleys was not attempted again until 1881.

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These early disasters may have also affected expectations about using agricultural products as a subsidiary to wool. No fields of crops were recorded for the northwest in the nineteenth century Western Australian Blue Books and the northwest pastoral and tillage books record only one temporary tillage lease, taken out in the Ashburton region in 1867. Such evidence as we have of embryonic intentions to cultivate is otherwise all confined to 1863–1864. After the initial 2 years, even reports of experiments with cultigens in kitchen gardens are confined to McRae's Millstream station, the only area of the Pilbara with abundant surface water. Even early attempts at growing kitchen gardens were quickly abandoned; the WA Blue Books recorded no kitchen gardens in the North District until Chinese market gardens were established in 1881.

Trade

The northwest frontier was an outflung node in the Western Australian trading network outlined in Chapter 3. As shown in Chapter 4, the northwest colonists took staples to the northwest whose success in coping with distance from overseas markets had already been proved in the southwest and Victoria. The northwest was, however, beyond their experience of distance. Freight rates indicate just how far economically, the northwest pastoral frontier was from the rest of the trade network (Fig. 5.1). Until 1877 all exports from the northwest went via Fremantle

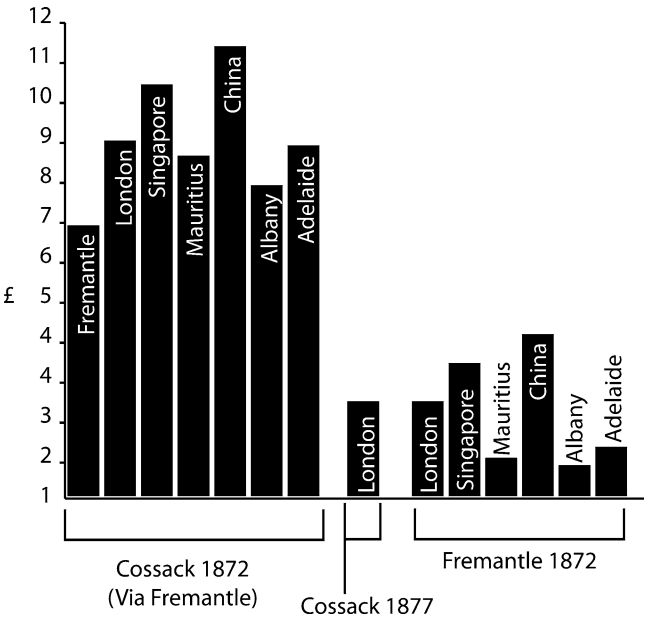

Fig. 5.1 WA freight rates

utilizing small coastal vessels on the coastal leg and London-based wool ships from Fremantle to London.

However, the cost of shipping wool from Cossack to Fremantle, £ 7 a ton, exceeded the cost of shipping produce from Fremantle to the main destinations shown in Fig. 6.2, meaning that freight costs in the northwest were at least twice what they were for producers near Fremantle. It cost a northwest pastoralist about the same amount to freight a ton of wool to London, via Fremantle, as he was paid for it (McRae 1868a, b; Blue Books 1874). It would have been to the northwest pastoralists' great advantage if they could ship directly from Cossack to their overseas markets but their wool was not valuable enough to tempt the London wool ships up a long dangerous coast.

Clearly, northwest woolgrowers could only break even at best. To cut transport costs woolgrowers could own or have shares in a coastal vessel. The latter option involved a reasonably large capital outlay and a great deal of risk. The Western Australian coast was a dangerous one for shipping and the northwest section was uncharted and virtually unknown.

The 1863–1867 harbor master records for Port Walcott (Cossack) record 23 different vessels having called at the port. Several of these were charters taking colonists to the frontier; however, eight vessels were coasters carrying guano, wool, and pearl shell to Fremantle and supplies back. Of these the *Mystery*, owned by Padbury, was used as a supply vessel for his station and the northwest generally. Padbury, with Withnell, also owned the short-lived *Emma*.

It was not until 1867 that other vessels came up the coast. The *Favorite* and *Wild Wave* (both owned by Bateman, Fremantle) and *The Brothers* (southwest owned) went on coasting trips to Cossack. The *Mary Ann* (originally Fremantle owned) also went north in 1867, where it engaged in some pearling before shipping wool and pearl shell back to Fremantle in August 1868. Howlett, a Roebourne storekeeper owned it, when it was wrecked collecting guano in 1869. The cutter *Albert* shipped wool and pearlshell to Fremantle in November 1867 in what appears to have been the first successful shipment of pearlshell from Cossack (CSO 1867:591). The vessel continued operating along the northwest coast, and Knight and Shenton brought shares in it which passed on to McRae and Co who owned the vessel outright when it was wrecked in 1880.

Several points emerge from this listing of vessels and owners. Firstly, until 1867, Padbury, (a wealthy absentee landowner with a station at stake in the northwest) owned the only vessels regularly engaged in the northwest coasting trade. Secondly, pastoralists working on their northwest stations appear not to have been in a position to even have shares in coasting vessels, only Withnell, who had a share in the *Emma* when she wrecked in 1867 tried this option. Thirdly, northwest storekeepers (Howlett, Knight and Shenton, McRae and Co) saw value in owning a coaster either partially or outright. Even if the coastal trade promised healthy profits, the initial capital outlay and/or the operational risks appear to have effectively barred all but a handful of northwest operators, and by the early 1870s the coasting trade was firmly in Fremantle hands. The rates shown in Fig. 6.1 were then established, and remained high until the advent of the regular steamer service in 1883.

The pastoral industry did not have the wealth to provide its own infrastructure to rationalize shipping costs. Land transport costs were also high; Owen (1933) reports that dray rates between Cossack and Roebourne were 25 shillings a ton in 1887, despite the short distance between the towns. In these circumstances a concentration near the port area as shown in Fig. 4.3 was virtually inevitable even for pastoralism, traditionally the most expansive land use. However unoptional this concentration was from the viewpoint of land management patterns, it still did not provide a densely populated hinterland from which normal central place processes could produce growth in the servicing node. Unable to provide what they needed themselves, pastoralists increasingly looked to the government to supply the necessary services. The early CSO records are peppered with complaints and requests centering on this issue (CSO 1864–1870).

The economics of the pearlshell industry was completely different. Pearlshell is heavy and compact, making it useful as paying ballast (a cargo which doubles as ballast leaving more room in the hold for other cargoes). The coastal shipping charged only £ 2 10 shillings per ton to take it to Fremantle, where it cost the same again to ship it to London where a ton fetched £ 180–200 (McRae 1868a, b; Blue Books 1874). The pearling industry also eventually placed sizable vessels in northwest hands that coasted to Fremantle, distributed supplies to the small landing places along the coast and collected wool to take to Cossack. As the pearling fleet also regularly visited Asia to collect workers, some supplying of the district may have come from this region. All this activity provided competition to the Fremantle-controlled fleet that had been the sole provider of these services.

The capital costs involved in pearling were less than those of wool growing, so were less of a barrier to new participants, whilst the gathering methods were labor intensive. Both factors combined to produce population growth. As pearling was a maritime industry, this growth concentrated on the coast near the pearling grounds, coalescing in Cossack. A larger population, accumulation of profits, and the accompanying acceleration of government revenue collection simulated growth in port facilities.

By the end of the second substantial pearling season (1869/1870) Cossack was transformed from an empty beach to a small port with a jetty, bond store and water police, all facilities provided by the government, plus a general store, a liquor outlet and a semi-permanent population. These services were all improvements the pastoralists had been asking for since 1864. By 1877, the port had been surveyed, a causeway built over the marshes and the coast charted (all at government expense), and the London wool ships were coming to the port to load wool and pearlshell for direct shipping to London (De La Rue 1979:67). The pastoral industry had suddenly taken a great step forward economically, for the price of shipping their wool to London plummeted from over £ 7 per ton to £ 2 10 shillings. The pastoral frontier soon started to expand and the Roebourne area began to take on characteristics that indicate it had entered into a more mature settlement phase.

By 1877 Cossack was the center for a fleet of pearling vessels of similar size to the Fremantle coasting fleet. Fremantle entrepreneurs had voiced fears that the emerging pastoral and pearling industries in the northwest, inadequately serviced by the Fremantle sailing fleet, would make their own arrangements and that

"northern settlements would become virtually separate from the south by dealing exclusively with Asia" (Henderson1977:38). That their fears were not unfounded is apparent from letters from vessel-owning northwesters such as the McRae's, who mention themselves and others undertaking coasting voyages to Southeast Asia for reasons other than simply picking up and returning labor. Freight rates are not available for the vessels operating out of Cossack, but India and East Asia are significantly closer to Cossack than Fremantle, giving Cossack-based vessels an advantage over their Fremantle rivals for trade between the northwest and these areas.

The WA Blue Books show that Singapore and Java supplied food products such as sugar, tea, coffee, and rice to Western Australia, while Singapore received sandalwood and horses. Some pearlshell is also recorded as being exported to Singapore, but the bulk of the pearlshell and all of the recorded pearls went to Britain, with Victoria also taking some shell. Mauritius took horses and provisions whilst being the major supplier of sugar, and Ceylon took horses and supplied tea. In addition, imports of British goods could also come into Western Australia from all the above ports. Wool went to South Australia and Victoria as well as Britain.

The trade northwest vessels would have been able to undertake with India, Ceylon, Singapore, and Java would have been a subset of this larger trade pattern. As Henderson (1977:52) has pointed out most of Western Australia's export revenue paid for imported food and beverages, especially sugar, tea, flour, and beer. Most of these items could be imported directly to Cossack from the Asian region, either as products of the region or as part of the trading link with Britain. A northwest trade not shown in the Blue Books is that in labor. Asia was an important supplier of labor for the pearling industry. From 1872, pearling vessels regularly visited the region to pick up and return Asian divers.

In return, the Blue Books indicate that the northwest could export stock, especially horses and some pearlshell to this region, northwest wool being taken directly to Britain by the London fleet. Other government records, in particular the industry's official export records up to 1901 (Fig. 5.2) suggest an unofficial (and illegal) export in pearls.

The export figures for pearlshell totals show the jagged profile that would be expected from an exploratory, extractive industry, but the plateau profile for pearls must be an artifice. It is extremely unlikely that the same total value of pearls was found for years on end. These figures suggest that the government continuously had to resort to estimating the value of the small, easily hidden pearls shipped out. While it can be argued that the government could not know the value of the pearls until they were sold in London, these prices would have been progressively available to update records. That they were not used suggests that the government was not convinced all the pearls were being cleared through customs. That the colonial government felt, whether rightly or wrongly, that it was missing out on rightful revenue is evident in the number of acts passed to try to regulate the industry. No less than 19 acts, sets of regulations and reports, were generated between 1869 and 1905. Whaling, another maritime industry, required only one, as did the pastoral industry.

That the pearlshell industry was very lucrative was soon apparent. The colonial government decreed a special Northwest Revenue Act in 1873 which required

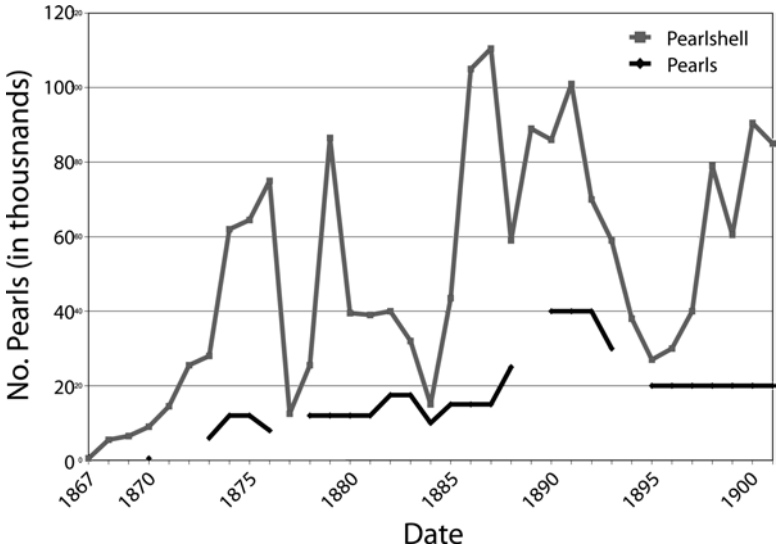

Fig. 5.2 Graph of pearlshell and pearls exported source: created from information contained in Government Statistical Register 1900

pearlers to pay licenses and an export duty of £ 4 a ton on pearlshell, and to deposit their ships papers at Cossack (Vic. No. 10). Before this date, Resident Magistrate Sholl gave the colonial administers in Perth what appears to be detailed information on the number and size of vessels, the size of the catch and expected income each year. By 1876, 3 years after the Northwest Revenue Act, he was finding this task much more difficult. This was partly due to the physical spread of the industry, with pearling vessels depositing their papers and catch at Geraldton and Fremantle as well as Cossack. However, the colonial government also appears to have found it hard to keep track of the industry, as shown in their numerous acts and regulations (many of which covered the same ground again and again) and in the continuous use of estimates for pearls. The pearl value estimates in Fig. 5.2 in fact show graphically the total inability of the colonial government to monitor this side of the industry even by 1901.

The issue of control is of major significance. In the nineteenth century, the northwest was administered from Perth, which in turn was administered from London. This administration had ramifications for the control of trade. Chapter 3 shows that in the southwest trading patterns were arranged first for the benefit of London-based shipping and second for Fremantle-based shipping. London ultimately dominated Perth's imports except for the more perishable items. Perth through Fremantle in its turn dominated the outer ports, supplying not only the London-derived goods but also the perishable items imported mainly from British Empire ports in the African-Asian region. The Cossack-based fleet, geographically closer to England's Asian possessions and with its saleable goods of pearls, pearlshell, and stock (particularly horses) threatened not London's domination of the northwest but Perth's.

The threat was in two forms, the first in lost trade for Perth and Fremantle entrepreneurs, and the second in lost revenue for the colonial government. The industry, far from being tightly regulated and controlled, developed into a powerful lobby group which successfully resisted moves by the colonial government which threatened its profits. This can be seen in 1887, when the Broome pearlers held up the granting of responsible government to Western Australia by sending a petition to London protesting their treatment by Western Australian authorities and asking for the north to be separated from the `impoverished' south (De La Rue 1979:81). The bone of contention was that the colonial government was trying to collect revenue from the pearling vessels, many of which by then operated outside state waters. The pearlers won the day and the colonial government retreated.

The industry again showed its collective power by resisting the Federal colonial government's White Australia Policy. The policy would have severely affected the industry which was dependent on imported labor, a dependency the industry rationalized with the argument that the Japanese and Malays were closer to nature and thus better able to find pearlshell. The government spiritedly disputed this line of argument but it lost its battle and pearling became the only industry exempted from the policy. It was affected by some regulations but as these were all aimed at containing and restricting the rights of imported labor they served to tighten the control of the white pearling masters over their workers.

On the surface, in the terms used by Paynter (1982, 1985, 1989) to describe social relations, the northwest regional elite appear to have developed into a powerful force, which should be reflected in the landscape and material culture of the frontier. However, who had true control of the northwest pearling industry?

The pearling industry went through several stages of physical and technological development forced by degradation of the resource. These changes allow the industry to be divided up into several phases.

1. 1865–1868 Beach combing and wading for shell on beaches close to Cossack.
2. 1868–1883 Naked diving from small coasting vessels, initially eighty miles either side of Cossack then in King Sound after 1879
3. 1884–1914 Hard hat diving of deep reefs using mother ship system. From Monto Bello islands to Admiralty Gulf.
4. 1915–1939 Hard hat diving using Japeanese tender system. From Monto Bello islands to Admiralty Gulf
5. 1946–1969 Decline of pearling industry. Hard hat diving using white and Japanese tender system. From Monto Bello islands to Admiralty Gulf

Each of these phases had different capital and running costs. Each new phase offered a challenge to the web of elite and primary producer relationships that resulted in change within the industry. Phase one had very low capital and running costs for people who were already in the Northwest. The situation can be likened to that of the very first gold prospectors striking it rich. The riches are confined to those already in the area but served to attract the attention of outsiders.

Phase two has higher capital costs requiring passage to the northwest, a small boat and the services of divers. However, these costs are much lower than those

involved with setting up a sheep station and would be within the reach of a greater proportion of the white population. The situation can be likened to a gold rush with a sudden rise in population of mostly males in a two tiered but otherwise fairly egalitarian setting. As further and deeper beds are worked however, some sorting of the white population into elite and non elites can be seen as the costs rose too high for the more unsuccessful pearlers. Phase three saw a sudden steep rise in capital costs. A fleet of small vessels and one large one was needed along with special equipment and skilled labor to work it. In 1884 the *Lily* and *Emma* were using hard hat diving dress (De La Rue 1979:79) By 1885 the fleet consisted of 44 vessels, 9 of which used diving dress (Shepherd 1975:99). Broome was the center for most of the hard hat diving vessels, which grew in numbers to dominate the pearling fleet.

In phase one, the beachcombing stage, it was local pastoralists and people stranded by the breakdown of the planned settlement schemes that went pearling. During phase two, naked diving, an elite core of local pearlers had emerged by 1875, while the periphery consisted of local pearling pastoralists and migratory pearlers from the southwest. Between 1883 and 1886, the higher costs involved with hard hat diving marginalized most northwest pearlers and London-based pearlers such as Streeters came to dominate the industry, working through local managers in Broome and to some extent Cossack (Shepherd 1975:111). The petition urging separation of the north in 1887 was clearly the inspiration of these outside interests. The petition argued that the system of locally owned boats using naked divers, the industry standard 2 years before, was now largely redundant as mainly non residents in foreign licensed vessels using diving dress (De La Rue 1979:81) carried out pearling.

Sturkey (1957:24) also documents the same shift of resources out of northwest hands within the pastoral industry. From the late 1880s ownership progressively moved out of northwest hands to the point where in 1898 the land in the Gascoyne and Northwest districts was monopolized by fifteen (mainly Perthshire) owners (Table 5.1).

The coasting trade also followed this trend. The advent of the regular steamship service connecting Fremantle, the northwest and London via Singapore in 1883 effectively channeled a large part of Fremantle's and Cossack's trade with London through Singapore, which became Western Australia's second largest trading partner. This trade was dominated by the West Australian Shipping Association, which was

Table 5.1 Lease owners in the Northwest and Gascoyne by order of number of acres leased (names grouped by order of magnitude into large, medium and small operators)

Large	Medium	Small
Dalgety and Co	Monger and forest	Sholl and Co
W.A. Mortgage and A, Co	Darlot Bros	Hooley and new
Union Bank	Forest and Bert	Bush and Campbell
	Forrest, Burt and Co	Forest A, and D, and Burt
	T. Burges	R. Bush
	W.A. Bank	

established in 1886. Despite its name, shareholders were mainly British, with Bateman and Shenton having smaller interests (Henderson 1977:164).

These changing trade relations throw up a number of interesting questions. For example, did the short-lived northwest owned pearling fleet affect the northwest's balance of trade with Asia enough to make the material culture of the northwest different to that of the southwest? How did the dramatic change in trade relations associated with the regular steamship service (Henderson 1977) affect the material culture of both Perthshire and Cossack?

Did the northwest regional elites of the 1870s and early 1880s manage to accumulate surplus in the frontier in the form of infrastructure and wealth accumulation? Were they affecting the dendritic pattern expected from the study of the southwest changing it to a more core-like pattern? Did their loss of control of the pastoral, pearling and shipping industries affect the patterns market capitalism carved into the northwest or was that loss of control one of the patterns that might be expected?

The Production System

Local Sustenance

Early archaeological research on colonization and frontiers were based on the American eastern seaboard (Balandier 1966; Honerkamp 1980; Lewis 1975, 1977, 1985; Leyburn 1935; Osborne 1977). These studies pointed to the role of isolation and adapting to new things like plant food sources in forming a new material cultural identity. An idea brought to the fore by Deetz (1977) in his book *In Small Things Forgotten.* But did isolation and the new environment play such a vital role in later colonization events like that of the northwest?

The colonists certainly hunted and fished local resources but they were able to focus on wild life with which they had already become familiar in the southwest and Victoria (Sholl 1866). Aboriginal techniques of hunting and fishing were not adopted in either the southwest or the northwest as guns, fishing lines and nets were adequate to the task. Although the colonists recorded Aboriginal use of plants the northwest colonists do not appear to have incorporated these plants in their diet. The early colonists suffered serious vitamin deficiencies through lack of vegetables, this area being one where their strategy of kitchen gardens was inferior to the Aboriginal gathering strategy. As John Withnell's son (1901:22 cited in Withnell-Taylor 1987:92) stated "It must not be thought that their food is limited, for it is quite the contrary. They have a variety of roots, berries, and vegetable leaves" yet despite this, and the close rapport John Withnell established with the local Aboriginals, he suffered badly from "black leg," a severe deficiency disease (Withnell-Taylor 1987:92).

Reciprocal trade with Aboriginal people also occurred early on at the local sustenance level; the Resident Magistrate records at least two instances where Aboriginal people traded fish for tobacco (CSO 194:1866). Subsequently, the fondness they developed for flour, sugar and tobacco was used to draw them into

the production system. However, it is extremely difficult to determine how important hunting and fishing were to subsistence through the historical record alone, and impossible to disprove a limited use of local plants. Future archaeological research on the faunal and botanical refuse from colonial sites and colonial items from Aboriginal contact sites is required.

Cash-Based Production System

As shown in Chapter 4, fine wool production and sheep-dominated mixed farming were the cash-based production systems tried in the northwest. Pastoralists from both the southwest and Victoria used shepherds and sheep dogs to look after their flocks. Victorians were used to keeping larger flocks in permanent folds while those from the southwest generally had a system of smaller flocks kept in temporary folds (Cameron 1975). Wool was sent to London via Fremantle until 1877 when the first wool ships arrived at Cossack.

The first part of the northwest production system to change was the labor arrangements, which initially involved either partners or hired white males. However, white labor was not only scarce on the frontier; it was costly (Withnell-Taylor 1987:51; Hall 1864). The occupation lease data show that manpower at northwest stations generally decreased after 1863. Employees quickly realized the power their rarity gave them and used it to bargain for better wages and conditions (for examples see Hall 1865). This was worsened for absentee employers as their managers could become established and start up their own stations. Both Hall and McRae (who managed the Roebuck Bay Association's leases after he arrived in the Pilbara) became station owners and Nairn at the time of his death was running both his own and Padbury's station. This echoes the preconvict situation within the southwest with its high labor costs, independent labor and high rate of laborers becoming owners of small stations or sheep flocks. But in the northwest the situation was not rectified by a sudden supply of convicts, as convicts, by law, were prevented from going to the northwest.

Long-term settlers of the northwest still boast of a tradition of neighborliness and free and open hospitality exemplified by Emma Withnell and her `mother of the Northwest' role (Withnell-Taylor 1987). Hall's diary and Richardson's memoirs are filled with accounts of settlers helping each other. Hall and Withnell assisted most new arrivals with landing stock, watering stock and their initial few days' accommodation. However, this popular cultural image of a northwest "family" masks the economic exchanges that were taking place. Consider, for example, the case when Hall helped McCourt look after Nairn's sheep and bullocks while they were left at the Harding River, he even looked after McCourt himself while he was ill (Hall 1865). In return, McCourt became Hall's right hand man, fetching the plough from Withnell and helping Hall plough and sow the field, and assisting with shearing, building sheds and running errands. Similarly, when Taylor stayed with Hall he did the cooking in return (Hall 1865), and the many other settlers who initially stayed with Hall at Wellard's Andover Station later assisted each other with shearing

and other laborious jobs. The diaries and memoirs of northwest colonists record such instances as a common part of life, and indicate a clear expectation that such help would be reciprocated in full when needed. The tradition functioned as an adaptation to a situation where paid white labor was rare and costly. Within the northwest, the southwest system of contract labor was transmuted into a system of labor bartering in which very little cash changed hands.

The local Aboriginals were also incorporated into the northwest production system to a much greater extent than in the southwest (Cameron 1981; Erickson 1978; Garden 1977, 1979; Richards 1978; Sanders 1975), and surprisingly quickly. This is particularly true of the peaceable Ngalooma people who lived around the Harding River (Withnell-Taylor 1987:42). Emma Withnell, who arrived in April 1864, had, by October of the same year, taken on two of the local Aboriginal women as household servants. Richardson records that Hall sent an Aboriginal man to Pyramid station with fresh beef in December 1865 (Richardson 1914:32) and recalls that from early on Aboriginal men were used to fetch water, light fires, and carry wood and messages (Richardson 1914:21). R.J. Sholl, by 1866, felt able to say that "the natives are a fine lot of men, their conduct is good and from the first settlement until now, have been able to help the settlers" (CSO 581:1866)

Hall's diary records who did what, each day, and so tracks the process of incorporation of local Aboriginal labor. Hall started with two Swan River Aboriginals but he sent them back after 3 months. Initially he was suspicious of the local Aborigines, especially when they gathered in large numbers near his stock (Nov. 1863), but in June 1864 he first mentioned that he had an Aboriginal looking after the lambs. He trusted one Aboriginal sufficiently to find a lost gun, but still viewed the general population with suspicion and required that all his people go armed. The trusted Aboriginals helped with the lambs under the supervision of shepherds but they were only partly integrated into the system and could wander away (June 1864). In July 1864 Hall let all but two of his hired help return to Swan River, and by August, Aboriginals were his shepherds, under the supervision of one white shepherd. By December one of the Aboriginals was trusted enough to be allowed to use a gun and Hall's diary makes two references to his shooting ducks.

Richardson (1914:21) makes it clear that the Aboriginal people were originally paid in rations only and, moreover, they received only half the rations given to a white laborer (McRae 1869a, b). Richardson also firmly believed that the Aboriginals were later turned into idle insubordinate vagabonds when the government insisted on cash payment (Richardson 1914:62). His views reflect prevalent attitudes among the frontier pastoralists. He believed the white colonists were a "strong and masterful race" in contact with "an inferior, ignorant and savage race." However, as long as the Aboriginals were, "employed on the stations, engaged in station occupations and personally supervised and under the control of the station owner or manager, things were right enough" (Richardson 1914:62). The introduction of cash payments of course weakened this control.

With control came a degree of paternalism, very evident in some cases such as Withnell and Treverton Sholl (Withnell-Taylor 1987), and a sense of ownership. The McRaes' often wrote of one or other of the brothers being away "hunting

[rounding] up his natives" (e.g., McRae 1877a, b). Legal control was also instituted so that although the Aborigines were paid in kind rather than cash, they were considered to be employed under the Master–Servant Act, which subjected them to punishment for running away.

By 1878 employment had progressed to a formal system of indenturing, with Aboriginals indentured for 1 year and Chinese workers for two (Sturkey 1957:31). Formalizing labor relations was apparently not so critical in the pastoral industry, which the government saw as having a paternal stance toward Aboriginals, but it quickly became an issue in pearling. Acts were passed, not to prevent the pearlers from contracting laborers who could not read the contracts they were signing, but in an attempt to avoid the outright abuses which offended the government's notions of justice.

That the Aboriginal people were at a disadvantage within the legal system can be demonstrated by their regular use in prisoner road gangs. "Roads were constructed by prisoners, mostly Aborigines. The Aboriginal prisoners worked on the roads in pairs, hitched or yoked together and chained by twelve feet of light mesh chain: one end was fitted by a leather band of leather around his neck, then linked at the end of the chain to his workmates chain" (Withnell-Taylor 1987:101). Such a sight was a familiar one around Cossack and Roebourne until at least the 1920s (H M Wilson pers. comm.).

In summary, the government's refusal to allow cheap convict labor left the colonists with high transport and labor costs. As already demonstrated, there was little they could do about transport costs and white labor exploited its scarcity to demand higher wages. They therefore turned to Aboriginal laborers, who could be paid in food, and labor bartering between themselves, as the only available means of cutting costs.

The natural environment also prompted changes in the pastoral industry. In the early years the hot and drought-prone environment worried the stockowners until their sheep prospered during a severe drought in 1865 and 1866. Sholl wrote "In no part of Australia would stock be in the condition they are in this district after so protracted a dry season" (cited in De La Rue 1979:63). This encouraged colonists to persist in the hope that the transport situation would improve. The climate did however have an unforeseen ramification; the hot dry conditions and variable rainfall affected the fleece which grew coarse and uneven, making it unsuitable for the London fine wool market where the highest prices were obtained.

The lack of water, and the difficulties experienced in washing the red dust out of the fleece before shearing also forced a change to exporting "greasy" wool (De La Rue 1979:65; Richardson 1914:31). Greasy wool fetched a lower price and cost more to export as it weighed more. This development represents a simplification of the production system as the product was exported one step closer to its raw state then it was in either the southwest or Victoria.

Finally, manpower problems, combined with the shortage of building materials, and the abandonment of the practice of manuring fields for cropping, led to the disappearance of the use of folds. The Victorians had more trouble with this change than the West Australians as it took 2 years for their stock to get used to being outside folds (De La Rue 1979:64).

Nonetheless sheep were never challenged as the major stock species for the Pilbara region, but changes did occur in the supplementary systems. Blue books

Table 5.2 Stock percentages 1865–1895

District	Date	Total# stock	% sheep	% cattle	% horse	% pigs	% goat	% dairy	% chicken
North	1865	16,470	97.00	1.82	0.7	0.3	–	–	–
North	1869	50,352	98.3	0.87	0.69	0.005	0.09	–	–
North	1873	74,545	97.2	1.48	1.2	–	–	–	–
North	1874	93,113	97.2	1.48	1.3	–	–	–	–
North	1876	1,37,710	97.6	0.76	1.53	–	–	–	–
North	1884	4,95,248	95.6	3.08	0.88	0.05	0.33	–	–
North	1891	8,50,948	95.76	2.4	1.03	0.04	0.13	0.09	0.48
Roeborne	1895	3,74,683	96.5	1.56	1.82	0.06	0.04	–	–
Pilbara	1895	1,02,267	86.5	11.76	1.14	0.07	0.48	–	–
Ashb	1895	2,90,695	97.8	1.54	0.58	0.02	–	–	–

records can be used to establish stock numbers (Table 5.2), but some caution is necessary. The figures are based on owners estimating how much stock they were running, so therefore are open to error. Also there are variations in what was recorded, with dairy cattle and chickens being recorded only for the 1891 census. Some discrepancies such as cattle increasing by twenty thousand in 1875 and decreasing by the same number in 1876 and a similar occurrence for both cattle and horse numbers in 1881 are likely to be recording errors rather than wild fluctuations in stock numbers. If these more obvious deviations are ignored some trends are visible.

Stock in the first few years of settlement was more varied with pigs and goats forming a small part of the system and cattle forming 1.82% of total stock. In the 1870s stock variability shrunk to the three staples of sheep cattle and horses. Horses grew to a steady 1.2–1.53% of stock as a result of an export trade to the Indian army but dropped back in 1881 when the army began to breed its own remounts (De La Rue 1979:69). Cattle numbers remained mainly steady at 1.48% of stock. In the 1880s and 1890s small numbers of pigs, goats, and kitchen or market gardens were added. Regional variation is visible by 1895 with a rise in importance of cattle in the inland Pilbara that supplied beef to gold miners and a pattern in the Ashburton very similar to the 1860s initial settlement of the Hardy River area.

The above outline demonstrates that a satisfactory supplementary staple, of equal importance to wheat in the southwest, was never established. Cattle, and for a short time horses, provided some economic return but did not fill the void left by the Pilbara's unsuitability for wheat. De La Rue suggests that "without the income derived from pearling, it is probable that far fewer squatters would have survived those difficult early years" (De La Rue 1979:70). Pearling appears to have filled the role played in the southwest by wheat. Initially pearling was carried out during September to April, after shearing and before lambing. Although largely determined by the warmth of the water for naked divers, this timing neatly corresponded to the season for wheat harvesting in the southwest.

Although known as pearling, the industry based at Cossack and later Broome was primarily concerned with mother-of-pearl (M.O.P.). The northwest coast boasts the biggest and best M.O.P. in the world, *Pinctada maxima*. Pearlshell was exported with only the removal of the oyster meat being undertaken in the northwest. Only in the

treatment of pearls were any value added manufacturing stages carried out. Pearls and pearl blisters were peeled to remove blemishes and reveal pleasing shapes. This was a skilled task and if carried out successfully could double the value of the object.

A separate industry was based at Shark Bay and exploited a smaller oyster which yielded numerous yellow pearls. Unlike the Cossack industry the primary concern of Shark Bay pearlers was these unusual pearls. Although some pearlers working Shark Bay were from Cossack most of the prominent pearlers and pastoralists who settled in the area came from further south (McGann 1999).

During the industry's early days the M.O.P. divers exploited pearl beds on either side of Nichol Bay up to a distance of eighty miles using small boats and teams of Aboriginal skin divers (McRae 1874a, b). Reports of pearlers' kidnapping Aborigines begin as early as February 1869 (CSO 646 and 153) prompting government attempts to regulate the use of Aboriginal labor. Laws were passed in 1871 and 1873 that were designed to protect Aboriginal labor and prevent the use of Aboriginal women as divers (Vic. No. 14 and 10). Also from 1873 pearling vessels had to deposit their papers at Cossack for the duration of the season. Licences were £ 2 a vessel and there was an export duty of £ 4 a ton imposed on mother of pearl (Vic. No 10). As well as providing income for the government the revenue paid for a pearl fisheries inspector and a revenue boat to police the act. This was the beginning of many government attempts to control the pearling industry and the revenue it represented.

Government regulations led to more use of Malay labor. ("Malays" was a generic term for a variety of indigenous people from the islands and coastal regions of Asia that was used by both the government and the pearlers. The term has been kept here because it is no longer possible to distinguish individual peoples from the historical documentation). The Inquirer (10/4/1872) reported that Captain Cadell was bringing in about 30 Malays making a total of about 50 working in the industry at that time. By October of the same year this total had jumped to about 130 (Inquirer 27/10/1872). Employment of Malays increased and by 1875 there were 989 Malays and 493 Aboriginals employed in 57 vessels licensed at Cossack. Combined with those in vessels licensed in other ports it was estimated there were as many as 1,800 Malays and 228 Europeans working in the industry (Sholl 1881). During this early period pearlers appeared to have gone to South East Asia and made their own arrangements for workers. Farquhar McRae even hired Port Essington Aboriginals from the Macassar slave market (Inquirer 6/10/1875).

The death rate among the Malay divers was high and promoted action by both the Dutch and Australian governments. The Australian government passed stricter laws regulating the recruitment and treatment of labor and the Dutch East Indies government required pearlers to pay a bond of 200 florins per Malay diver which was forfeited if he died or was not returned to his home port. The Dutch East Indies government also fixed a minimum wage level that the pearlers thought was too high. As a result the level of Malay divers dropped from 989 in 1875 to 9 in 1876. Although this number improved during the following years Malays did not again threaten the Aboriginal divers' central importance to the industry until the widespread adoption of the diving dress.

It appears nearly all pastoralists were involved in pearling in some way, either out on the boats themselves supervising divers or through owning shares in boats.

In 1875, 22 of the 47 licensed boat owners were northwest residents (Government Gazette 1875). Most owners with more than one boat resided in the south but Alex McRae, Broadhurst and Von Bibra (from the Murchison) also had between 2 and 4 boats each. In 1877, during a slump in the industry caused by the depletion of the nearer beds, only 4 out of the 19 owners lived in the northwest (Government Gazette 1877). By 1880 the beds in King Sound had been located and the pearling rush was on again.

Table 5.3 lists identified northwest settlers (up to 1880) who combined pearling with some other activity, compared to those who appear to have been solely pearlers, and pearlers who were not resident in the northwest. The most common activity

Table 5.3 Northwest pearlers

N/W pearlers who combined other activities	N/W pearlers	Fremantle-based pearlers
Eaton	Paterson	Reid
Mcraes	Williams	Robinson
Mcleans	Seda (Malay)	Payne
Chapmans	Ericksons	Harwood and Co
Mckenzie Grant	Ellery	Rankelda
Stewarts	Ramsamys	Craigg
Withnell	Thompson	Scott
Broadhurst	Mccarty	Kerr
Sholls	Brown	Watson
Hall	Riddell	Marmian
Simpson	Larkham	Bickly
Couch and Howlett	Clarkson	Cadell
Edgar		Thomas
Harper		Brennan
Anderson		Smith
Price		Graham
Forrest		Hoyh
Mckays		Hill
Hilliard		Harris
Spencer		Long
Taylor		Smith
Fisher		O'grady
Von Bibra		Annais
Brown		Ravenkeld
		O'dell
		Barnan
		Turner
		Edwards
		Reonas
		Haywood
		Asendroph
		Mountain
		Thompson
		Duff

to be combined with pearling was pastoralism, followed by coastal trading and running stores or hotels. McRae and Co, and Couch, also had interests in copper mines. Specialization within families, partners or businesses is evident with one or more of the group specializing more heavily in pearling than in other areas of communal interest (see McRae letters, Stewart letters, Richardson 1914).

As the beaches and shallow beds near Cossack became worked out, larger boats and more time was needed to get the divers to and from the beds. Also, as the shallow beds were worked out, hard hat diving took over the industry. Both changes made it more difficult for pastoralists to continue as part time pearlers and most either switched to full time pearling or went back to full time pastoralism. While the shift in the transport system with the accompanying lower freight rates after 1883 should have made pastoralism more viable, it was during the late 1880s that the pastoral industry began to shift away from northwest control (Sturkey 1957:24).

By the 1887–1888 season only 100 Aboriginals were employed for diving in the pearling industry and most of the boats were no longer locally owned. Diving dress was taking over from skin diving and at this stage most of the hard hat diving was done by Malays (Smith 1888). Cossack was still regarded as the center of the industry which stretched from the Monte Bellos to the Admiralty Gulf (Smith 1888) but by the middle of the 1890s the effect of Broome's dominance was noticeable at Cossack as a slump in the industry (Thompson n.d.). During the 1890s the Japanese took over the diving side of operations until by 1902 they dominated this part of the industry (Edwards 1983:52).

The changes from beachcombing through to hard hat diving, with the accompanying changes in costs and elites, can be related directly to degradation of the resource and the continuing need to locate new beds and find successful methods of extraction from deeper beds. These changes flowed through to changes in workforce personnel, support town and ultimately into changes in ownership leaving the northwest pearlers centered on Broome mainly as a collection of managers of business's owned off shore.

Pastoralism and pearling were not the only early northwest industries. Copper and lead mines were opened in the area in 1873 (McRae 1873a, b) but such mineral industries were of minor concern until gold was discovered in the Kimberleys in 1884 followed by discoveries in the Pilbara. The Pilbara field was declared in 1888, the Ashburton in 1890 and the West Pilbara in 1895. The Pilbara field was the most profitable of these fields but it was never as immensely profitable as the eastern goldfields of the Coolgardie-Kalgoorlie district.

James Withnell started the Pilbara gold rush by picking up a gold bearing rock at Mallina station on the Sherlock River during January 1887 (Withnell-Taylor 1987:224). The Pilbara field was proclaimed later the same year. The initial rush was centered on the Sherlock River and Pilbara Creek and was serviced through Cossack and the small port of Balla Balla, with small towns inland on the gold fields. The rush quickly moved to the Nullagine fields. The towns of Marble Bar, Nullagine and Port Hedland were established to service this field. The Pilbara gold rush lasted until the turn of the century and served to establish Port Hedland as a major rival to Cossack. Also the towns of Nullagine and Marble Bar grew into major service towns for their area.

Northwest pastoralists never became involved in the mining industry to the same degree as they did in pearling. The Pilbara has many mineral resources but few were tapped by the colonists, either because the sources were not located, the technology that would make the mineral useful had not been invented (for example asbestos), or their exploitation was uneconomical. Iron ore falls within this last category: navigators had long known that a magnetic anomaly existed in the Pilbara indicating the presence of an iron ore body but it was not until the 1970s that the technology to mine the ore profitably was developed. The McRae's and Couch did open a few lead and copper mines in the 1870s but freight rates made the ventures marginal and they remained small affairs run in conjunction with other sources of revenue such as wool growing and pearling. Gold, discovered in 1887, was a far more profitable concern, yet the pastoralists opened stores and boarding houses to supply miners rather than flocking to the goldfields themselves (De La Rue 1979:87).

Paynter (1982, 1985, 1989) envisioned colonization and frontiers in terms of different groups struggling for control over the resources of the region through domination and resistance strategies. He saw the production system as a vital area of domination and resistance between homeland and regional elites, and this is amply demonstrated in the northwest. He also envisioned this to be an arena for struggles between regional elites and primary producers; however, this story is harder to elucidate from historical documentation. The documentary evidence is biased toward revealing domination by the white elite and resistance by white primary producers. There is less documented evidence of resistance by Aboriginal and Asian primary producers recording only the violent resistance of these peoples, such as the murders associated with the start of the pearling industry in the Hardy River area and a later mutiny and murder of a Broome pearler which lead to a revision of race relations within the pearling industry (Edwards 1983). Evidence of non violent resistance requires archaeological research.

Settlement System

In the southwest a dendritic pattern emerged based on the regional ports and the entrepôt with inland penetration along rivers with secondary settlements at transshipment points along the river with the first usually placed where the river ceased to be navigable. Rivers, valleys and plains allowed easier travelling and therefore formed movement corridors which assisting settlement, while natural hazards such as dangerous coasts, forests and arid areas formed barriers to settlement. The fierce resistance of the Murray River Aboriginal population also formed a different type of barrier to settlement for a short while. In terms expressed by Paynter (1982, 1985, 1989) this dendritic pattern which combines the concentrated surplus and unequal transport aspects of the $K=4$ transport and $K=7$ administrative principles is the result of the British homeland elites dominating the control of surplus from the southwest. If homeland elites also successfully dominated the northwest then a similar pattern would emerge.

There exists reasonably reliable historical information on the timing and location of pastoral leases, the location of towns, even quite small servicing nodes, the types of services provided and the population statistics of the serviced area.

These historical records show that initial settlement focussed on favorable areas reported by Gregory's expedition, i.e., the De Gray, Harding River, Millstream, Maitland River, Sherlock River and the Upper Ashburton. It then spread rapidly to the unknown Kimberley on the basis of an escaped convict's story of gold and grasslands. A combination of distance, unsuitable land, and hostile Aboriginals contracted the frontier back to the Maitland-Sherlock rivers focal area (Fig. 4.2). The Camden Harbor, Roebuck Bay, De Grey and Ashburton settlements all recorded Aboriginal attacks on settlers. In the Roebourne region no attacks were recorded until 1868, when stealing from a pearling vessel led to arrest, the murder of the arresting officer and colonial retaliation.

The port for the Maitland-Sherlock River focal point was the landing place called variously Mystery Landing, Tsein Tsin and eventually Cossack within Butcher Inlet, which was separated from land suitable for pastoralism by extensive sea marshes. At first the nearest fresh water was the permanent waterhole in the Harding River, twelve miles inland around which the town of Roebourne coalesced. This hindrance to settlement at the port was resolved by 1868 as stock wells had been successful sunk before a small permanent government force was based in the hulk of the *New Perseverance*.

The small coasting vessels of the period could anchor in Butcher Inlet but were not able to navigate up the Harding River. Pilbara Rivers are typically not navigable, even by flat-bottomed lighters, for most of their length during most of the year. Most reduce to a series of widely spaced waterholes during the dry season and turn into wide raging torrents under the influence of cyclonic rainfalls during the wet. On the Harding River lighter transport ended with 90 m of salt marsh still to cross before the land trip to the Harding River pool could be started. A small transshipment point called Upper Landing developed at the limit of navigation with Withnell soon providing a small warehouse and a short stone causeway to firm land. The Harding River pool functioned from first settlement as a regrouping place where settlers and stock recovered from the sea journey and the trip across the marshes. Two of the first three homesteads lay close to the pool or, in the case of Withnell, on the pool's edge. This homestead grew into the town of Roebourne with the arrival of the Resident Magistrate.

Expansion from the focal area started in 1879 but really surged ahead in the early 1880s. The 1881 census sketches the settlement system on the verge of this major expansion. It consisted of two towns, Cossack and Roebourne, set in a pastoral hinterland of isolated stations. Cossack was the only registered port for the northwest, therefore all imports and exports attracting export duty had to go through the town. The northwest transport network involved overland cartage usually to the nearest sheltered beach or inlet, where coasters picked the wool up and delivered it to Cossack.

Six hundred and sixty colonists lived in the northwest, 342 in Cossack and Roebourne, with most of the homesteads also focused on the two towns. Cossack had

a total population of 229, mostly males, residing in 27 recorded houses. As it seems unlikely that so many people were living in so few houses, dwellings in China town may not have been recorded. Table 5.2 shows the occupations of the town residents. Apart from pearlers, pastoralists, and government officials who represented law and order, there were a high number of sailors reflecting Cossack's status as the northwest's only port. The other occupations reflect essential services such as carpenters and blacksmiths, and low order trade functions such as general stores and hotels. The mason, painter and brickmaker indicate a moderate presence of specialized essential services, while servants and the goldsmith indicate the town was at least at level 3 in the modeled southwest settlement hierarchy shown in Table 3.1. The development of port facilities such as a longer jetty, warehousing, customs house and bondstore, ship's stores and warning lights also shows a level 3 town standard.

Roebourne had a lower population (113) with a more even mix of males and females residing in 25 houses. Occupations show that Roebourne was clearly more oriented toward servicing the pastoral industry. There were more tradesmen offering low level essential services, and a wider variety of higher-level services including a doctor and a pastry cook. Upgrading of services during the 1880s turned Roebourne into a level 4 town, but in 1881 it stood poised on the threshold.

The northwest in 1881 lacked the full range of specialized settlement types found in the southwest (Fig. 3.3 and Table 3.1), but the pattern is quite similar with a trading port (Cossack) and nearby administrative town (Roebourne) coalescing within the initial focal area. Roebourne, however, lies beyond the limit of Harding River navigation reflecting the limited capacity of northwest rivers to act as transport corridors. The Ashburton River is the only river in the Pilbara area that allows even partial navigation, and the town of Onslow was eventually located at the transshipment point.

Attenuation of the settlement system is clearly visible. In the southwest, small satellite settlements had started to cluster when the area's population reached 150 (Table 3.2). In the northwest, at a time when approximately 660 colonists lived in the area, the only clustering was within the two towns, producing greater population centralization than in the southwest. It would appear that the dendritic drainage pattern emerging in the northwest was more extreme than that of the southwest at a similar stage. Together with the analysis of the costs associated with the trading network (Fig. 5.1) this suggests the homeland elites from the southwest and Britain had such domination of relations with the new colony that they were able to put all the costs of transport onto the northwest colonists, leaving virtually no surplus in the frontier to support even low-level clustering outside of the two townships.

The census map of 1891 (Fig. 5.3) shows the movement of the frontier out from the focal area, by showing the numbers of people residing in each subdistrict. Pastoral settlement pushed inland from Roebourne across the Archaean granite plain to the Hamersley Ranges, whereupon desert conditions prevented any further movement eastwards. The De Gray and Ashburton drainage's were also recolonized, for by the late 1880s the Aboriginal people in these areas were no longer perceived as a threat to settlement, having already been incorporated into the pearling industry. The rugged ranges between the Ashburton and the Gascoyne formed a natural

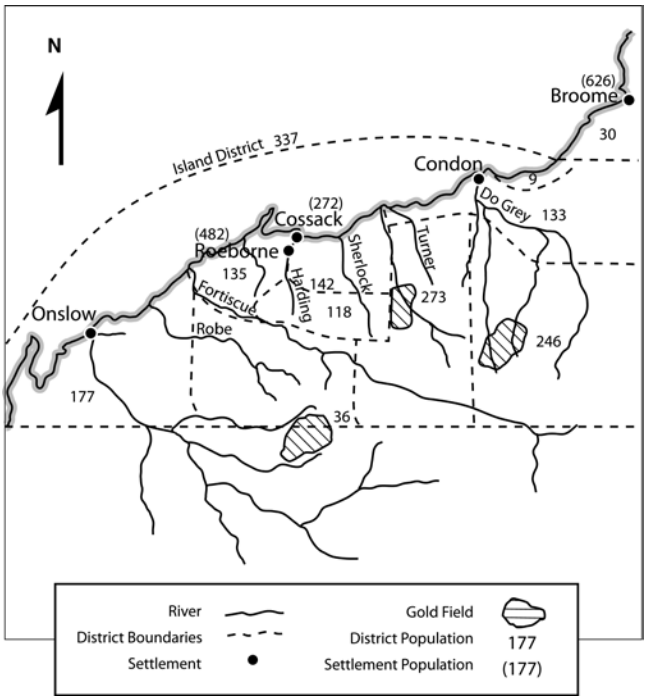

Fig. 5.3 1891 census map Source: modified from Western Australian Census 1891

barrier to the spread of settlement further south and the desert to the north of the De Grey halted progress in that direction. The expanding frontier then leapfrogged up and down the coast extending to the Gascoyne and the Kimberleys.

By 1891 there were four settlement areas within the study region, each with its own port town all, except Broome, situated at the head of a river system (Broome is on a tiny creek). The initial focal area serviced by Cossack and Roebourne was however, still dominant in terms of population densities and trading patterns. The two towns were linked by road, river lighter and from 1887 horse-drawn tramway, which significantly reduced transport costs between the towns. Between 1881 and 1891 Roebourne grew faster than any other town in Western Australia the area's first newspaper, the Nor'West Times, was started in the town and by 1896 it boasted the first car (Thompson 1970). The variety of specialized occupations shows clearly that it was now a level 4 town (Table 5.4, for levels refer to Table 3.1). Cossack was the thirteenth fastest growing town, but its population balance had changed with more females moving to the town and a number of single men moving away as the center of pearling operations moved to Broome. The range of 1891 occupations in Cossack shown in Table 5.2 illustrate that it stood, similarly to Roebourne in 1881, poised on the threshold of moving into level 4 status; as indeed occurred briefly with the upgrading of government and port facilities during the early 1890s.

Table 5.4 Occupations in Cossack/Roebourne 1881, 1891

	1881		1891	
	Cossack	Roebourne	Cossack	Roebourne
Government official	1	2	1	3
Constables	2	1	2	9
Hotel/staff	4	4	–	–
Domestic servants	16	6	34	61
Merchant	1	1	–	–
Storekeeper	1	–	–	–
Commercial clerks	2	3	–	–
Shipmasters/crew	56	2	–	–
Store laborer	1	1	–	–
Farmer	1	–	–	–
Pastoralists	5	1	5	20
Shepherds	2	2	–	–
Ostler	1	1	–	–
Ship builders	4	–	–	–
Painter	1	–	–	–
Mason	1	1	–	–
Carpenter	1	4	–	–
Teacher	1	–	1	1
Butcher	1	1	–	–
Pearlers	59	2	–	–
Sawyer	1	1	–	–
Cooper	1	–	–	–
Blacksmiths	2	–	–	–
Goldsmith	1	–	1	–
Brick maker	1	–	–	–
Laborers	6	2	11	–
Shop men	2	–	–	–
Undefined	7	1	1	46
Surgeon	–	1	–	–
Drayman	–	1	–	–
Station manager	–	1	–	–
Postmaster	–	1	–	–
Saddle maker	–	1	–	–
Wheelwright	–	1	–	–
Blacksmith	–	3	–	14
Pastry	–	1	–	–
Boot maker	–	1	–	–
Clergy	–	–	1	–
Fine arts teacher	–	–	1	–
Board and lodgings	–	–	9	8
Bankers	–	–	3	6
Estate agent	–	–	1	–
Retail textile	–	–	5	–
Butchers agents	–	–	5	6

(continued)

Table 5.4 (continued)

	1881		1891	
	Cossack	Roebourne	Cossack	Roebourne
Mineral drink	–	–	1	–
General dealers	–	–	17	14
Mercantile	–	–	1	3
Road carriers	–	–	3	15
Sea/river carriers	–	–	38	7
Postal carriers	–	–	1	4
Telegraph	–	–	2	2
Storage	–	–	1	–
Ship builder	–	–	1	–
House builders	–	–	6	–
Textile cleaning	–	–	1	–
Market gardens	–	–	4	–
Drinks manufacturer	–	–	1	–
Laborers roads/harbors	–	–	7	–
Water supply	–	–	1	3
Miners	–	–	4	41
Charity	–	–	–	2
Literature	–	–	–	1
Insurance	–	–	–	2
Dress making	–	–	–	1
Engineering/survey	–	–	–	5
Amusements	–	–	–	2
Shipbuilding/ equipment	–	–	–	10
Animal dealer	–	–	–	1
Railway	–	–	–	2
Agricultural	–	–	–	7
Newspaper	–	–	–	1
Jewelers	–	–	–	2
Construction/road/ harbors	–	–	–	1
Road repairs/rubbish disposal	–	–	–	2
Fisheries	–	–	–	4
Carriage maker	–	–	–	2
Harness maker	–	–	–	2
Watchmaker	–	–	–	1

Population densities mark the utilization of localized resources. By 1901 the Pilbara goldfields was the only area with sufficient population to sustain clustering of small nodes. Pearlshell as a maritime localized resource also had a clustering effect, shown in 1881 by the concentration of males in Cossack and by 1891 with concentrations in Shark Bay, Cossack, and Broome. As a maritime industry its hinterland is the sea leaving the land hinterlands behind Shark Bay and Broome virtually unpopulated.

Clustering within the northwest appears not to have gone beyond this embryonic stage and much of the land-based clustering disappeared as the goldfields declined.

The 1925 post office directories show the shift in port dominance within the Pilbara and Broome regions (Wise 1925). Cossack had only 15 listed servicing nodes all of them providing low-order functions such as retailing, hotels and essential services, and the town contained only two pearlers. Roebourne had 113 listings, but many involved pastoral stations and the two asbestos mines that used the town as an address. When these are removed there are 57 service nodes within the town with a spread of functions which indicates a level 3 town. Broome had 393 listings, mostly pearlers or pearling related functions; when these are removed there are 49 different functions in all, with multiple listings of functions such as stores, banks, carriers, and boarding houses. The duplication and spread of functions indicate that Broome was a level 4 town by this period. Extending the same analysis to other places shows that Port Hedland was a level 3 port catering to pearlers, while Onslow only reached level 2 and catered largely to pastoral stations (Wise 1925, refer to Table 3.1 for explanation of town levels).

In sum, Broome with its emphasis on pearling was now the major town of the region, while Port Hedland and Roebourne were secondary towns catering mainly to pastoral stations. Cossack had lost its status as a port to Point Samson and was dying as a town (Point Samson never advanced beyond level 2) while Onslow had settled in as a low-level pastoral town. Inland, the gold mining centers of Marble Bar and Nulligine were level 4 towns.

It is clear that from 1864 to the end of the study period in 1925 very strong homeland domination persisted in the region resulting in an even more attenuated drainage pattern than that in the southwest. This pattern, like in the southwest, drained the region through regional ports but with no major port entrepôt dominating the port trade network. Broome dominated the pearling industry trade but not that of the pastoral industry or mining. Instead port specialization is apparent with trade from Broome and Port Hedland being mainly pearlshell, that from Onslow and Cossack mainly wool but with some pearling. Balla Balla, Port Hedland, and Cossack also serviced the Pilbara goldfields, although by 1901 this trade was vanishing and the miners were moving on to other fields.

Yet, in 1881, Cossack and Roebourne were the fastest growing towns in Western Australia, and the northwest pearling fleet was starting to replace the southwest owned coastal fleet in the supplying of food stuffs to the region from Asia. Both suggest the northwest regional elites were succeeding in accumulating people, wealth and surplus in the northwest and were altering uneven trade relations. So how did the situation change so rapidly?

The regional port pattern in the northwest of a series of small export ports with no major import/export port suggests this port system was being robbed through hinterland theft as occurred to Rockingham, Mandurah, and even Albany in the southwest. However, there is no network of roads linking these ports to the Fremantle entrepôt as happened in the southwest but, from 1883, there was a strong transport link connecting Fremantle to each northwest port and on to Singapore and London, the coastal steamship service.

This transport link was in the hands of the West Australian Shipping Association, which was owned by the major shippers operating to Western Australia, who were mainly British with two smaller southwest shareholders. They started a short sharp price war to capture Western Australian trade using favorable discriminatory rates to get wool growers and pearlshell shippers to use the steamship service and unfavorable discriminatory rates to punish anyone who sent a shipment by another shipper. Then in 1886 the West Australian Shipping Association and their major rivals formed a conference of shipping interests to keep Western Australian shipping rates artificially high (Henderson 1977:164) a situation which lasted until the West Australian government took over the steamship shipping services in 1912. Their strategy was so successful that by 1889 no sailing vessels arrived or departed from Fremantle and the London wool ships no longer visited the coast.

Their strategy would have also affected the coasting trade northwest pearlers were establishing and possibly also the economics of pearling vessels visiting Asia to pick up their own workers. It is likely to have effectively nullified the northwest resistance strategy of using the pearling fleet as coastal traders placing northwest colonists back into the position of being reliant on transport supplied by others and at the mercy of their fare pricing structure.

High freight rates at the start of colonization effectively held the northwest settlement to a small focal area that was just breaking even by slashing production costs. The reestablishment of high freight rates would have had a devastating effect on the small northwest owner pastoralists. It is noticeable that it is after the establishment of the shipping conference in 1886 that northwest and Gascoyne landownership moved out of the hands of small local owner occupiers and into the hands of fifteen large landowners who were mainly southwest absentee owners (Table 5.1).

It was doubly unfortunate for the northwest colonists that at the same time as high freight rates were making their primary stable economically unviable a change in the cost and technological requirements of the pearling industry also removed their secondary staple.

The northwest colonists therefore were forced out of the region or they became mangers for outside interests. In Paynter's terms (1982, 1985, 1989) they changed from regional development elites trying to accumulate wealth and surplus in the northwest by trying to isolate the area from the demands of homeland elites to regional dependency elites. This type of elite are seen to actively help homeland elites drain the regions resources in return for help in maintaining a personal elite lifestyle and in maintaining control of the region and its workforce. Control is maintained by leaving enough surpluses in the region for police and administrative superstructure and some monumental construction to provide visual reinforcement of the correctness and rightness of the governing system.

The northwest colonists' loss of control of the shipping, pearling, and ultimately the pastoral industry, therefore, completely changed the nature of their relations with British and southwest elites, and from the mid-1880s, they served to enforce the extremely strong homeland domination of the region. The extreme drainage pattern and lack of population and infrastructure which emerged in the northwest

is, therefore, likely to be a pattern that can be expected when market capitalist's forces are successful in establishing ultimate control of a region.

However, the question still remains. Did the northwest development elite of the 1870s and early 1880s manage to accumulate surplus in the frontier in the form of infrastructure and wealth accumulation during their brief period of resistance?

Chapter 6
Town Site Archaeological Surveys

Historical information exists for all towns within the study region; however, the usefulness of the information in terms of this research varies both by town and through time. The four most important towns within the northwest colonization process were Roebourne, Cossack, Broome and Onslow (now known as Old Onslow to distinguish it from the current town of Onslow).

Of these towns, the most intensive historical and archaeological research has been carried out on the port of Cossack, now a heritage listed abandoned town (Bain 1982; Carson 2003; De La Rue 1979; Hardie 1981; Hutchison 1991; Lewis 2003; McIlroy 1988, 1990; Nayton 1990a, b, 1991, 1992a–c, 2002; Paterson 2003, 2006; Wilson 2005; Withnell-Taylor 1987). Archaeological and historical research has also been carried out on part of the port of Broome, which is still a living town (Atkinson 1988; Aris et al. 2001; Chapple 1993; Edwards 1983; Hocking and Nayton 1995) and on the abandoned heritage listed town of Old Onslow (Nayton 1991, 2009; Webb 1983). The administrative centre of Roebourne has not been studied archaeologically, although the history of the town is included in histories of the Pilbara (Bain 1982; De La Rue 1979; Hardie 1981; Withnell-Taylor 1987).

Town Site Archaeological Surveys

Cossack Surveys

An archaeological survey was carried out in the Asian "quarter" of Cossack (McIlroy 1988). The area surveyed lay between Lot 148 and the cemetery to the east. A baseline was laid along the Perseverance Street boundary of the lots and a series of pegs were laid to the south of the baseline between it and the shore. The area was then divided into 10 m north south strips for surveying. A walk over survey located and flagged sites for theodolite survey, while most marked sites were partly cleared before recording and disturbed artefacts were recovered. Surface collection of some Asian artefacts was also undertaken. A number of sites were test pitted with sediments removed as one layer and deposits were sieved through a 5-mm mesh.

G. Nayton, *The Archaeology of Market Capitalism: A Western Australian Perspective*, Contributions To Global Historical Archaeology, DOI 10.1007/978-1-4419-8318-3_6,

A second archaeological survey was carried out (McIlroy 1990), which covered the area between Pearl Street and the start of the 1988 survey. The same methodology was used, and sites were again cleared for recording, including trenching around the inside and outside of stone foundation walls and clearing off stone paved areas at four major sites. Some artefacts from these clearing operations were retained.

In 1989, the author started a long association with the historic site of Cossack as part of postgraduate studies. A preliminary field trip was undertaken to find a suitable site for excavation that had not been extensively disturbed by bottle hunters or previous archaeological research.

Historical research located three maps and a surveyor's sketch that included locational details of structures in Cossack. This is an unusual amount of information on the location of private structures and confirmed Cossack's desirability as a research site. Details of the early town are shown in Taylor's (1870) map (Fig. 4.1) of Suburban Roebourne that shows the position of the first substantial building (Knight and Shenton's store) and the hulk of the schooner *New Perseverance.* More detail was found in a sketch drawn in the corner of an 1872 town map (Loftie 1872) that shows three structures. One of these is the Knight and Shenton store, another is likely to be Howlett's store and the third is an early pearler's house. The town plan also shows the first jetty lying alongside the hulk of the *New Perseverance*.

In 1886, Cossack was surveyed in preparation for laying out a tramway that was built in 1887. This survey records the 1886 lot lines, the second jetty and the location of all buildings (but not very small structures such as privies) in Cossack at that time (Fig. 6.1). This plan includes the Cossack post office, the first stone building within the township, which is extant today. Also, Thompson (n.d.) includes a sketch map of the town as he recalls it from his childhood (ca. late 1890s–1900), recording the approximate locations of buildings in Cossack along with information on their use and ownership (Fig. 6.2).

Two prime areas identified through this and other historical research were the Cossack Business District and lots 108–112, which were thought to be a possible location for the first pearlers temporary bush huts.

Figure 6.1 (PWD 39) was used as the basis for a tape-and-compass survey of the business district. This plan was the most detailed of the available sources and contained the location of the stone post office. The building could, therefore, be used to position the archaeological survey by triangulation onto the 1886 lot lines.

Two baselines were used, one along the 1886 boundary of Pearl Street and the other along the 1886 boundary of Perseverance Street with the Alpha Datum set up on top of an 1886 underground water tank (Nayton 1990b).

Using the baselines, it was possible to metaphorically drape a metre square grid over the whole town site. This was done by describing and numbering each possible square as so many metres north, south, east or west of the intersection of the two baselines. In this way, it was possible to relate any part of Cossack to any other using the same grid. The north-eastern corner of each square was used to provide the reference number for that square. The intersection of the two baselines was labelled Beta Datum.

Lots 119–123, comprising the main business district, were mapped in 20-m strips running parallel to Pearl Street using tape and compasses. Small individual

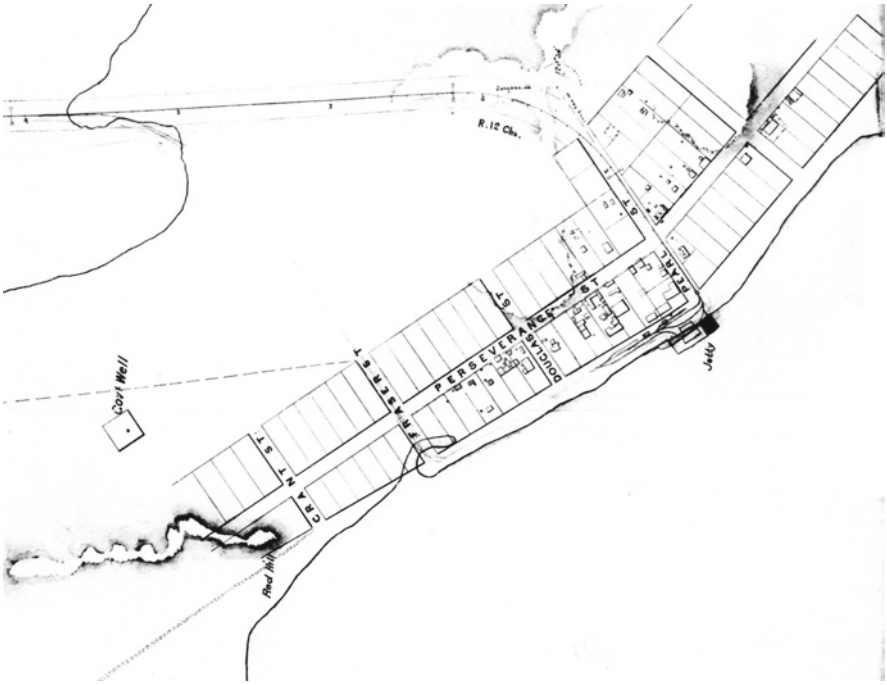

Fig. 6.1 PWD 39: Cossack in 1886. *Source*: PWD 39 cons 1647, item 00039, West Australian Archives

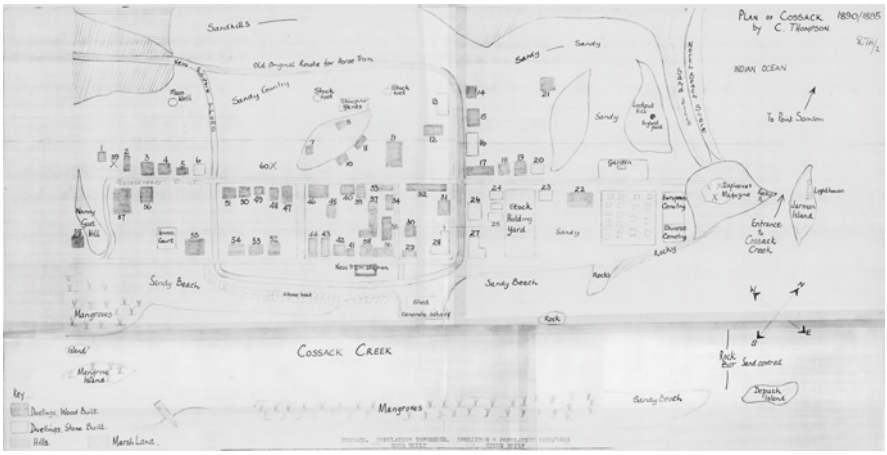

Fig. 6.2 Thomson's plan of Cossack ca. 1900. *Source*: Thompson (1900)

artefacts such as isolated broken bottles were not mapped, but concentrations of such material were. All material relating to buildings was recorded. When the results of the survey were compared to Figs. 6.1 and 6.2, many sites could be related to Thompson's map but fewer to the early 1886 map, suggesting that

buildings with foundations still visible mainly relate to Cossack at ca. 1900. As the town was in decline by 1900, these buildings relate to the last stage of town development at Cossack.

A subsurface transect sampling technique employing small 50 by 50 cm test pits, excavated in 10-cm spits and spaced 10 m apart along two parallel transects was, therefore, used on Lots 108–112 to probe for evidence of ca. 1869 pearlers' huts. The two transects were positioned at 60 and 90 m west of Beta Datum. No evidence was found in these lots to suggest the presence of early pearlers' huts. Artefacts from the two transects indicate late nineteenth century occupation that was focused on the two structures shown in PWD 39 and identified by Thompson as Truslove's.

Two locations that could have been Cossack's first store, one on Lot 123 and one on Lot 122, were also tested. That on Lot 122 was very shallow and archaeologically sparse with the main evidence consisting of a line of stones that could mark the edge of a wall.

Lot 123 was historically and archaeologically more promising. Both Figs. 4.1 and 6.1 show buildings on Lot 123 in the approximate position as features archaeologically surveyed in 1990 (Nayton). Thompson identified the buildings on this lot in ca. 1900 as the northwest store manager's house (Fig. 6.2). However, none of the maps quite match each other. The features drawn during the archaeological survey indicate either that different buildings were built sequentially at the same location over time or that there was one building that had been added to over time.

Three test excavations sampled this busy corner of Lot 123. The first (at s28w3) attempted to find the corner of the 1886 building shown in Fig. 6.1. Artefact concentrations were encountered in the top 28-cm of dark sandy deposit over a thick almost sterile layer of loose white sand. A second test pit located adjacent to the northern side of the first pit (at s27w3) also encountered a top 28-cm layer of artefacts, but at a depth of 55 cm a square post shadow 10×8×3 cm deep was found. The shallow vertical extent of the feature together with its depth below other archaeological deposits suggests that this post shadow is the base of a former square post at this location.

A third test excavation, 50 cm wide by 1.50 m long, was dug beside the remains of a nearby stone chimney (at s23e2). The second structure shown on Lot 123 in PWD 39 was located in the same area as the chimney, and it was thought that the building might have been a detached kitchen. While the chimney itself was not particularly substantial, below ground, it was found to have ten courses of foundations extending to a depth of 1.09 m and eastwards for 1 m (Fig. 6.3). Artefacts were found in fluctuating densities adjacent to and below the structure, indicating the possibility of a great depth of artefactual material in parts of the site.

The tested corner of Lot 123 was considered to have the best potential for the location of the main excavation. It contained two clearly defined sites that appear to have suffered little disturbance. The lot was the first town lot to be bought, and its occupational history extended from 1870 to 1979. The area was subsequently excavated in 1990.

An archaeological survey of Cossack in 1991 completed the archaeological survey of the main town site (Nayton 1991). The aim of the fieldwork was to record

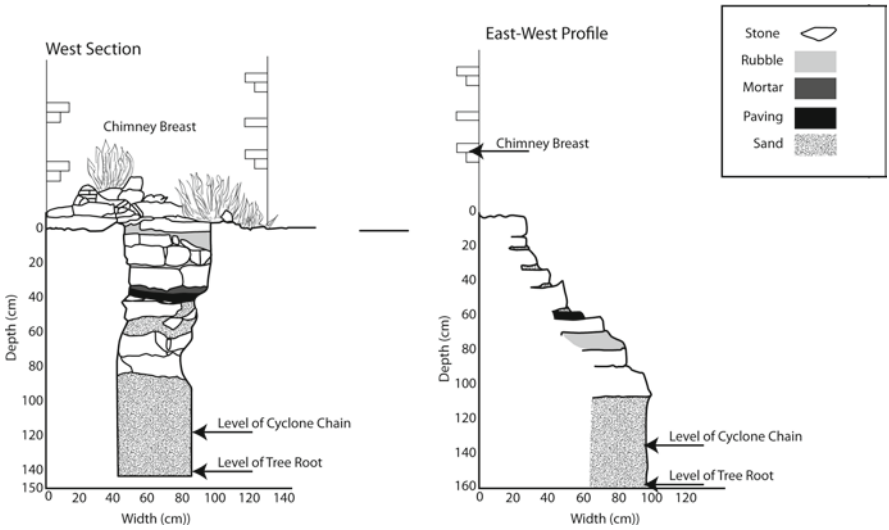

Fig. 6.3 Excavation drawings: stone chimney front and side profiles

the locations of visible structures within the area along with any information that would help identify and date them. The survey was orientated onto the 1886 lot lines by surveyors from the Shire of Roebourne with survey pegs driven into selected lot corners. These corners were used as theodolite stations for the archaeological survey that divided the area into small closely inspected search areas. Sites were not cleared for recording as this practice results in accelerated site deterioration. For the same reasons, surface artefacts were noted but not collected. Eighty-four sites were identified ranging from modern disturbance to features that can be linked to structures shown in Fig. 6.1, Loftie's sketch on the back of his 1872 town map and Thompson's (n.d.) sketch map of the town at ca. 1900 (Fig. 6.2).

Sites outside the main town lots were inspected but not surveyed during the main 1990 field season. They were reported in Nayton (1990c) and include an extensive Aboriginal midden on the outskirts of the town, town wells and the wreck of a steam lighter. Sites also included the tram station, tramway, sea wall, stone wharf, cemetery, explosives magazine and jetty. Reader's Head lookout was also inspected along with an Aboriginal art site, a house and well, town rubbish dump, Upper Landing, Deep Hole Jetty, Lazerette, Deep Hole Mooring and the Jarman Island lighthouse and lighthouse keeper's quarters.

Analysis of a 1985 aerial photographic enlargement of the town area (Cossack Town 1985) showed other archaeological features not obvious on the ground. These features were added to the 1991 survey information. Afghan cameleer sites on the fringes of the tidal flats and at Settler's Beach were surveyed in 2002 (Yates 2002; Nayton 2002). Further Aboriginal occupation sites around the fringes of the town were surveyed, and some test excavated in 2003 (Carson 2003; Lewis 2003; Paterson 2003; Wilson 2005) as part of an extensive project to research colonial

settlement in the Pilbara. Together, these surveys form a detailed picture of the visible archaeological sites at Cossack and the results have been amalgamated to show all the archaeological evidence for the main town area on one plan (Fig. 6.4). The Cossack township was also revisited in 2009 to establish changes wrought by a severe cyclone in 2006, which flooded half the township. This survey updated the evidence of the previous surveys in affected parts of the town site (Nayton 2010).

Broome Surveys

An archaeological survey has been conducted of the Broome Chinatown area including jetties and areas of pearling camps adjacent to the Dampier Creek in the Chinatown area (Aris et al. 2001) as part of a heritage assessment for registration under the Heritage of Western Australia Act 1990. The Broome Chinatown area is still an active urban area and comprises the main shopping area of Broome. The area still retains many heritage buildings and building facades, although redevelopment has eroded the heritage fabric of the place.

As such, most lots are both built on and in private ownership and that curtailed entry onto the rear portions of many lots. An aerial photographic analysis was, therefore, carried out of the whole area including privately owned backyard areas. The aerial analysis was followed up by physical site survey and metal detector survey of all publicly open areas. Some privately owned areas were able to be viewed from lot boundaries, but sites viewed could not be closely examined. The combined survey information resulted in detailed mapping of archaeological building footprint features across the Chinatown area but more patchy information on feature dating and associated artefact spreads. No matching archaeological survey has been carried out across the rest of the historic Broome town area.

Old Onslow

An archaeological survey was undertaken of the Old Onslow Townsite in 1991 (Nayton 1991). The survey had a significant time constraint and was only a stage-one preliminary survey. However, no further archaeological work has been undertaken in the main town site other than a brief follow-up survey in 2009 (Nayton 2009b). The purpose of this survey was to determine the extent of bottle hunter damage within the town site in the 16 years since the preliminary survey.

The central four town lots, consisting of the lots containing the police complex, post and telegraph office, hotel and home of the first town resident were surveyed in detail. At a lower level of detail, a tape-and-compass survey of sites off the main street from this central area to the town entrance was undertaken. Further information on the extent of the historic occupation of the town was gained by carrying out

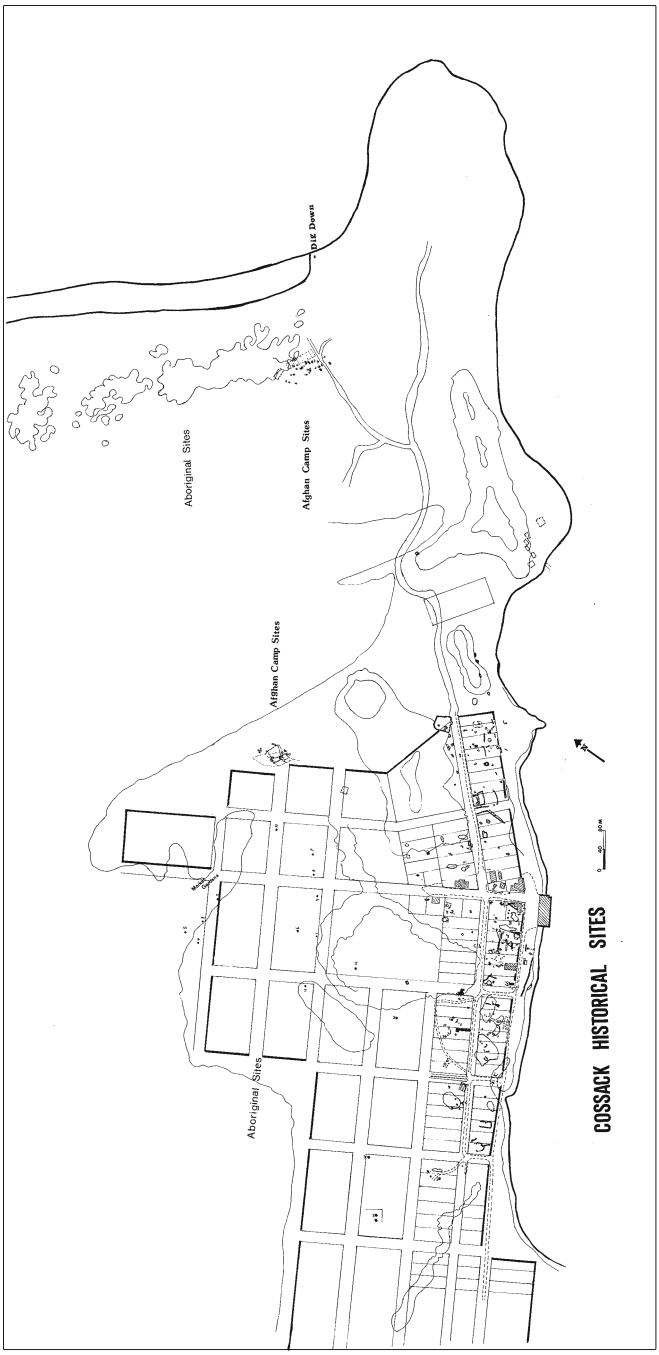

Fig. 6.4 Cossack: amalgamated archaeological surveys

walking surveys to find the boundary of occupation at the four cardinal points of the compass. Lastly, a drive by survey was undertaken of features located along a 1901 tramway route to a small sea port built for the town at that time. Recent surveys have filled in more detail of the 1901 tramway route and the location and archaeological significance of features within the 1901 port (Nayton 2009a, b). However, the survey information from within the main town site provides insufficient evidence to include Old Onslow in the analysis of town development for this chapter.

Town Site Analysis

The Social System: Expression in the Built Environment

The analysis of the initial social system in Chapter 5 established that the owners and managers of pastoral runs wished to establish themselves as pastoral elite. Initial archaeological research has been conducted at a number of original pastoral stations, but this information is largely not yet available with only some preliminary findings (Paterson 2006) an honours thesis (Sanders 2005) and a paper focusing on rock art (Paterson and Wilson 2009) having been published. However, the extent to which pastoralists managed this should be indicated by census information that gives snapshots of northwest society and built environment through the study period in 1870, 1881, 1891 and 1901. Unfortunately, the census information is not as useful as it could have been as both information areas and types of information gathered varied from census to census, making comparisons difficult. Also, information on social indicators varied widely or was missing completely from census to census. However, with these biases in mind, an attempt can be made to synthesize the information.

The 1870 information on the northwest is sketchy (Table 6.1). The small population was mostly male living in small wood and thatch houses (5.5 per structure).

Table 6.1 1870–1881 census information

1870 census information				
Population	Male	Female	Child	–
172	114	29	29	–
Houses	Wood	Brick/stone	–	–
31	25	6	–	–
1881 pastoral population				
Population	Pastoralist	Shepherd	Aboriginal	Chinese
249	68	75	525	32
1881 pearling population				
Population	Pearling master	Ship master or crew	Aboriginal diver	Asian/Chinese
481	67	63	351	31
Cossack residents	59	56	351	31

Six buildings were of sun burnt brick, stone or rammed earth, and three of these were larger buildings. There was one town, Roebourne, which in 1868 contained five buildings, all of which were larger brick/stone structures. This gives a picture of a mainly rural population particularly as Hall resided largely on Andover station rather than in his town house and Withnell's residence was in fact his pastoral homestead. The ruins at pastoral station complexes surveyed in 2004 (Paterson 2006) were mainly not part of this early landscape as they were of mortared stone; however, the adobe structure at Tambray Station might belong to this early period; a dating analysis of the ceramics and glass shards used to strengthen the construction is required to either confirm or deny this.

By contrast, the 1881 census records that 40% of the houses and 53% of the population lived in Cossack or Roebourne (Table 6.1). Given that there may have been more unrecorded structures in Cossack's Chinatown and the population statistics do not include Asians and Aboriginals working in the pearling industry, this gives a picture of a largely urban northwest population residing in small wooden houses of 1–4 rooms.

This leaves a pastoral hinterland of 249 people, 50 of which were white females living in 81 structures (3 per structure) on 68 stations. The social system of pastoral elite's white shepherds and male and female Aboriginal servants seen emerging on the stations in 1864 was still operating in 1881. To this had been added Chinese indentured labourers who worked as shepherds, station hands, stockmen and boundary riders (Atkinson 1991). The low number of people per structure also indicates that the pastoral elites may have established the landscape they desired of scattered pastoral properties focussed on a main homestead. There is no census information, however, on the size of these homesteads.

Archaeological research on the ruins at pastoral station complexes surveyed in 2004 (Paterson 2006) may provide this evidence. While the archaeological survey information published to date does not provide dates of construction for the surveyed stone ruins, census information suggests a late 1870s or 1880s date is likely. The 1881 census shows that 11 pastoral houses were built of stone and 20 were of wood; as outbuildings were listed separately, these totals relate to the pastoral homestead of each property. The totals and types of material were similar in 1891, indicating that the period of construction of the desired pastoral landscape occurred between 1872 and 1881.

Evidence both for the consumption of luxury items in the remote Pilbara outback and variation in that consumption across homesteads is reported (Paterson 2006) with the Withnell's Sherlock Station built around 1880 (Withnell-Taylor 1986:197) indicated as having the highest level of visual consumption. The station was the second home built by the Withnells in the northwest, the first at Mount Welcome station was of timber and brush. Old Woodbrook station owned by relatives of the Withnells (Withnell Taylor 1986:197) also shows evidence of status materials as a German piano was carted to the station then left behind when the station was abandoned (Paterson 2006:104).

The Sherlock homestead, which was built of stone bonded with mud mortar, boasted a wide verandah, a substantial stone fence separating the homestead from

working areas (Withnell-Taylor 1986:197) and was decorated with cast iron lacework, painted interior tiles and at least two fancy fireplaces, one of white marble and one of black slate (Paterson 2006:104; Sanders 2005:16). The station complex contained a greater range of ceramics than any other site surveyed with most evidence concentrated around the homestead ruin (Paterson 2006:104). Sanders research qualifies this remark by determining that the assemblage around the homestead was composed mainly of more expensive decorative ceramics while that around a second structure identified as being associated with station workers contained a majority of cheaper decorated ceramics (Sanders 2005:132). The station layout was also segregated with the workers and work areas distanced from the homestead by 70–100 m (Sanders 2005:15). The homestead was also situated in a bend in the river giving a 180° view of the watercourse from its northern verandah. To the south, a hill lay between the homestead and the work area where the workers also lived. Interestingly, the archaeological evidence suggests this hill, in the centre of the station complex, was used by the Aboriginal workers for their own cultural purposes implying Withnell, who had, 20 years before, been inducted into the tribe, both knew of the practice and allowed the area to be set aside for their use (Sanders 2005:143).

Archaeological surveys have been conducted at nine former homestead complexes, but as yet only Sander's (2005) honours thesis, a brief overview paper (Paterson 2006) and one study of rock art (Paterson and Wilson 2009) have been published. Therefore, there is only one other published map from the surveys to compare Old Sherlock Station too, that of Inthanoona station. According to Paterson and Wilson (2009), the Inthanoona Station ruins they surveyed were built and owned by Viveash, Wilkington and Middleton in 1866, and it is the location of the early construction of a pearling lugger (Paterson and Wilson 2009:100). However, Heritage Council of Western Australian documentation on Tambrey Station states Viveash, Wilkington and Middleton bought Andover Station from Burges in 1867, and the lugger was built there (HCWA 1998, op cit Battye 1912:69, same information also contained in Bain 1982 citing Viveash Acc 11001 B.L.). The confusion appears to arise from Andover, Inthanoona and Tambrey stations all being leases owned by Viveash with all three homesteads built by 1893. Tambrey apparently was the last one constructed (HCWA 2009).

Given that the original reference for the vessel being built at Andover Station is from Viveash (Viveash Acc 11001 B.L.), who helped build the vessel, Andover is likely to be the earlier of the two other locations. Dating for Inthanoona provided by Paterson and Wilson (2009) is very generalized and is based on the lack of twentieth century glass and the presence of "black" bottle glass (Paterson and Wilson 2009:103). As black bottle glass is present on Western Australian historical sites to ca. 1925, this does not provide convincing evidence of a ca. 1867 date for the surveyed complex.

Given the presence of substantial stone structures at the station, census information (Census 1871, 1881) again argues for a date between 1872 and 1881. This suggests Inthanoona with its stone paved homestead and substantial stone stockyards and shearing shed is likely to share a similar later 1870s/early1880s date, as the

Old Sherlock Station and represent not the first struggle of establishing a homestead but the establishment of a landscape that reflected the social ideal of the pastoral elite.

Inthanoona is spread over two sides of a river with the stockyards, shearing shed and camping area for Aboriginal people and pastoral workers (quite possibly the same people) on the southern bank and a homestead complex of homestead, workers quarters, cookhouse, forge and other outbuildings clustered on the northern bank. The layout appears to be based loosely on an English farmyard with the homestead, workers quarters and cookhouse situated quite close together with smaller outbuilding, including the smithy situated further away. The survey recorded 3,500 artefacts by a sampling procedure that, when adjusted for the total area, indicates a total of more than 45,000 (Paterson and Wilson 2009:103) with 90% of the artefacts concentrated within the northern complex. It contained almost all of the ceramics and half of the glass. Interestingly, almost all of the glass worked by Aboriginal people was found near the homestead, while three quarters of the worked stone was found around the stockyards. Does this indicate a social division within the Aboriginal people working at the site? This question is not covered in the paper, which has a main focus on the numerous rock art engravings at the complex, all of which occur south of the river in the stock working area of the complex. However, the paper's research does conclude that Inthanoona was set up deliberately as a segregated complex with homestead complex and stock working area with its Aboriginal camp separated by a river that flooded during the wet season and had a stony difficult bed to cross in the dry. It also concluded from the spatial division of artefacts that this separation continued through the life of the station (Paterson and Wilson 2009:108).

Many of the northwest pastoral elites were connected either by kinship or by business arrangements to pearling operations. A total of 26 names are listed in Table 5.3, four of which represent families of brothers. This suggests that just under half of the 1881 pastoralists had some connection to the pearling industry.

The census indicates that there were 68 pastoral elites in the hinterland and 73 pearling and other non-pastoral elites, 65 shipmasters or crew (Roebourne had two pearlers and two sailors) 31 Asians and 351 Aboriginals living in the two towns (Table 6.1). However, only 44 of the pearlers and 17 of the ship's masters and crew are recorded in the post-office directories as living in Cossack, suggesting that the additional 54 men may have been part of a floating population that returned south after each season.

The census records 27 structures in Cossack. This figure is unlikely to include Aboriginal Mia Mias in the camp outside of the town and similarly may not include shanty structures in the Cossack Chinatown. Even if the non-white section of the population is excluded, this still leaves 198 people sharing 27 small houses in Cossack (approximately 7 per structure), suggesting that the majority of the Cossack population was somewhat cramped. Three structures had 7–10 rooms; these are likely to have been the two hotels and Stack's boarding house, all venues where pearlers are known to have stayed. Only 7 pearlers and 1 mariner (Tuckey) owned lots in Cossack in 1881/1882; the pearlers are Hall, McRae, Sholl, Howlett, Thompson, McCarthy and Clarkson. The last three were purely pearlers, while the others had combined occupations.

The differences between 1870 and 1881 indicate that the pearling industry did result in an accumulation of surplus in the form of population and structures within the frontier. From the differentiation of occupations, pearlers also appear to be a local elite in an industry with white pearling masters, ships masters and crew (possibly also with some Chinese crew) and Aboriginal and Asian skin divers. Many of these pearlers were closely linked, either by blood or by business ties, to pastoral elites and other urban elites, such as merchants, hotel owners and the resident magistrate.

This status does not, however, appear to have translated into an urban elite environment to any large degree with Roebourne averaging 4.5 people per structure and Cossack 7 per structure, with most structures being smaller than 4 rooms. There is markedly less information on primary producers, particularly non-European primary producers who constituted a large part of the work force. The information that exists suggests that white primary producers had a higher status and presumably a higher level of material culture than non-Europeans.

However, it is clear that the emerging northwest adaptation is one of an intermingled web of pastoral and pearling elite with underclass layers of whites and non-European workers within a settlement system split between the frontier towns and a pastoral hinterland. This represents an adaptation of the land use and social system initially brought to the northwest forced by the adoption of a new secondary staple. However, it is puzzling that surplus accumulation appears to be unevenly distributed between the pastoral and pearling elite with the living standards of the pearlers appearing to be lower. However, more information on the material cultural differences between pastoral and urban elite is needed to determine if there was a differential accumulation of surplus between the two. The long-term archaeological project being undertaken within the Pilbara may eventually provide enough evidence to analyse the differences and postulate why they occurred.

The 1891 census occurred 4 years after gold was discovered in the Pilbara and 10 years after the region was connected to both Fremantle and London by the provision of a regular steamship service.

The 1891 census map (Fig. 5.3) shows that settlement had pushed out of the study area to the Gascoyne and the Kimberley with four ports within the study area, although Broome had a very small and sparse pastoral area. However, differences between all the towns and hinterlands cannot be distinguished in this census. It records subdistrict populations in the hinterlands, but only records detailed information on Roebourne and Cossack with some partial information on Broome. The census notes 2,422 people living in the North district, 319 of which were Chinese cooks, market gardeners and grocery assistants. The district employed 1,199 male and 938 female Aborigines, more than any other district in Western Australia. Most were associated with the pastoral industry with only 85 males and 14 females working with the pearling fleet. Other nationalities were not distinguished for this census. There were 464 houses in the North made of approximately the same percentage and range of materials as in 1881 but with the addition of 146 canvas structures and 54 huts. There is no information on house size or the number of houses within the towns. The tents and huts, however, are likely to reflect housing conditions on the new goldfields rather than the towns.

Roebourne grew extremely fast during this period with almost double the population of Cossack in 1891 with 482 (361 males, 121 females). Cossack was also still growing with 272 (186 males, 86 females), but it was starting to lose the pearling fleet to Broome (population 121), which by 1891 was the main base of the 800 strong pearling fleet.

Within the study area, occupations were only recorded for Roebourne and Cossack (Table 5.4). Pearlers are not mentioned, but the 14 (for Cossack) and 4 (for Roebourne) people listed under fisheries are probably a mixture of fishermen and the pearlers who were still based in the Pilbara. Boarding houses for the transient population are evenly spread between the two towns, but many more miners resided in Roebourne than Cossack (41 to 4). The presence of market gardens in Cossack (4 workers) and possible farming activities near Roebourne (7 agriculturists) are indicated filling some detail to Blue Book records, which show the presence of small semi-commercial market gardens and orchards and 4,136 chickens in 1891. That Roebourne benefited from the better transport link between the two towns is indicated by the location of ship's equipment and supplies in Roebourne rather than the port itself. In fact, other than for the number of sea/river carriers, Roebourne either equals or surpasses Cossack in most occupational areas.

There is not enough detail on Broome, other than the presence of the fleet, to establish if the town was accumulating surplus or at what rate. Roebourne during this period certainly fared better than Cossack in growth rate, and the provision of the tramway in 1887 appears to have let the town capitalize on the mining population to a greater extent and attract ship-servicing functions normally confined to ports. However, the number of pastoralists indicates a two-thirds drop in numbers over 10 years. This drop is even sharper when it is realized that, as with pearlers and crew, pastoralists and shepherds were no longer recorded separately. Pastoralism and pearling are the only areas where numbers drop, this being indicative of both the concentration of resources into fewer hands and the shift of the base for the main pearling fleet to Broome.

It is extremely difficult to form an idea of the social system from the 1891 census. Too much crucial information was not recorded. But by comparing the two censuses, a picture of an initial landscape of small elites that has given way to a landscape where resources are concentrated into a few hands can be formed.

The 1901 census should show this adaptation continuing. The census records most information by district, so it is possible to separate the original settlement area from outlying areas. The Roebourne, Pilbara and Ashburton districts essentially cover the 1891 North district, with the Roebourne district covering the original core 1870s settlement area. Coverage of nationalities is variable, being recorded by district except for the towns of Cossack and Roebourne and with employed Aborigines not noted. Occupations are not recorded at all except for the numbers in pearling. House numbers and materials are recorded by district and for the two towns of Cossack and Roebourne. Also noted are useful social indicators such as house size, how many lived in different sized houses and how many lived in boarding house, tents and public institutions.

Within the three former North districts, Roebourne had a population of 1,041, the Pilbara (mainly goldfields) of 1,042 and the Ashburton of 362. All the districts

had their own resident magistrates and law and order complexes. Roebourne was the centre for these functions within the Roebourne district.

The town of Roebourne had a population of 312 (a drop of 120), while Cossack had 287 (a rise of 15), leaving a hinterland population of 442. Frontier integration within the Roebourne district is suggested by the male–female ratio of 1:25; this ratio must have been almost even for the pastoral hinterland as both towns have higher ratios (Roebourne 2:12 and Cossack 5:83). By contrast, both outlying districts have high male to female ratios (Pilbara 10:1, Ashburton 6:22).

The Roebourne district population was housed in 269 mainly wooden or galvanized iron houses, 129 of these being within the two towns, leaving 140 houses to house the hinterland population of 442 (3 per house); this suggests reasonably comfortable conditions, although the size of the houses is not known.

On straight totals, the populations of Roebourne and Cossack were more cramped with 4 and 5.4 people per house, respectively. A clearer picture of population distribution within the towns is possible, however, as both house size and the number residing in houses of each size were noted. In Roebourne, 38.7% of the population lived in 37 houses of 3 or 4 rooms (3.2 per house). In all cases except for the 16 people living in the 9 one-room structures, the number per house is lower than the number of rooms, indicating that most of the population had their own room. Seventy-three people lived in hotel boarding houses, indicating that the houses of more than 11 rooms were boarding places or hotels and that probably half the people in houses of more than 7 rooms were also boarding. This leaves 10 people residing in large houses with a very low number per house, 76 in large to medium houses and with the largest section of the population in medium-sized homes.

Cossack also had the largest section of its population housed in 3- or 4-roomed houses (20.5%, 3.2 per house); however, it had more of its population in 1- or 2-roomed homes (18.4% at 2 per house). In Cossack, 17 people lived in hotel/boarding houses, which is the same amount as residing in the two largest structures (probably one of the hotels and Pead's boarding house). This leaves 4 people living in a house of more than 11 rooms (this is likely to be the staff of the other hotel), 9 living in 2 houses of 7–10 rooms and 17 in medium to large houses.

These figures suggest a small elite population in both towns (10 in Roebourne and 9 in Cossack) with 2–4% of the population being comfortably off petite bourgeoisie. Cossack appears to have contained a higher proportion of primary producers. This pattern may possibly be linked to race. Cossack had 64 Chinese and Asians and 53 people living in 1- or 2-room homes, Roebourne had 35 Chinese and Asians and 23 living in 1- or 2-roomed homes; however, more information is required to establish this. Also, more information is needed to identify the elite and primary producers and establish how status was maintained.

The only status indicator in the census for the Pilbara and Ashburton districts is a ratio of people per house derived from the totals. The Ashburton had 361 people living in 66 mainly canvas or galvanized iron structures, which is 3.3 per structure; of these, 195 people lived in the main town of Onslow. This compares favourable to the hinterland of Roebourne, but again house size is not known. The Pilbara had 1,042 people living in 195 mainly galvanized iron or wooden structures, which is

18.7 per structure, indicating cramped and possibly primitive conditions on the goldfields. There is no enough information in either case to determine the presence or otherwise of elites.

As the pearling industry generated a great deal of government interest at the time and scholarly interest since, more information is available for the Broome district. By 1901, Broome was the headquarters of the pearling fleet; indeed, this period is remembered as the golden age of pearling by former residents (Edwards 1983; Hocking and Nayton 1995). Many of the older Broome families can trace their association with the town back to this era. Out of a district population of 1,704, 1,072 were involved with the pearling fleet and resided in Broome or the lay up camps outside the town. Blue Book information shows that in 1900, 55 whites, 9 Chinese, 210 Japanese, 448 Malays, 230 Manilaman and 46 people of unspecified race worked in the pearling industry. By contrast, the Roebourne district had only 33 people involved in pearling.

In pearling, during this period, the mother ship system was the main system used. This involved a large schooner operating with a fleet of luggers. Skippers were white with an Asian crew and mainly Japanese divers, and the top diver for the season was treated as a hero. A strategy continued after the system changed to the tender system where Japanese divers were in charge of the luggers, and the pearling masters no longer had to put out to sea.

Money and status for the divers was linked to the yield, creating a pressure on the divers to take risks and push safety limits, leading to a high death rate (Hocking and Nayton 1995). In line with a policy developed after two mutiny/murders in the 1880s, the racial mix on each vessel was carefully picked to prevent the likelihood of the crew cooperating in a mutiny (Edwards 1983). The fleet consisted of 149 dress diving vessels and four skin diving vessels. The creeks outside of the town such as Willie Creek, Barred Creek and Cape Bossut were used for the lay up season and ship repair. When this practice started is unknown, but some Asian labour spent their entire contract in these camps and on the vessels, never actually seeing Broome (Hocking and Nayton 1995).

The pearling industry was the only industry to be exempted from the White Australia Policy of 1901, and the Broome district held far more Asians than any other district both before and after the passing of the act. The act, however, allowed more rigid control over the work force, as Asians were not allowed their women, to own luggers or to stay past their contract. Malcontents could also be deported (Edwards 1983). The town was strictly segregated. Chinatown thrived as the commercial and recreational centre of town, but although whites could be invited to join Asian ceremonies such as Chinese New Year, Asian participation in white leisure activities such as racing and the circus was strictly segregated. Asians were barred from the white part of town where the pearlers lived, but whites could run businesses within Chinatown (Edwards 1983).

The pearling masters lived a visually opulent lifestyle with large houses, servants and white suits in a town of red dirt and bore water supplies. Broome district had 145 buildings with the main building material being iron. It had three aerated drinks businesses by 1901 and a newspaper by 1908. It also boasted a permanent circus

and a racecourse. Although there was a district medical officer, the women of the town still had to act as midwives to each other (Hocking and Nayton 1995).

It is clear that, in the pearling industry at least, powerful elite with a suitably opulent lifestyle and almost complete domination over its primary producers had emerged. It is also clear from Chapter 5 that these people were not the original north west colonist's intent on creating an insular frontier but a second wave of colonists involved in a cosmopolitan frontier centred on pearling. It appears that most of the original colonists never managed to achieve this standard of elite status; however, a closer look at the living standards of the few original colonists still surviving as elites in the late nineteenth and early twentieth centuries is needed to verify this.

The above analysis shows that it is difficult to answer questions about the social system from the historical record alone. It appears that in the northwest the old frontier town was the centre of sociopolitical power but it did not lose this position with the movement of the frontier; other focuses simply opened up in the new areas. There was surplus accumulation in the northwest after pearling began, and Roebourne appears to have benefited more from the tramway link than Cossack stealing central place functions that normally reside in ports. In the northwest, generally, there is an accumulation of fixed structures and less crowding over time.

However, the mechanics of how this was accomplished and who was accumulating cannot be answered, and, therefore, many of the interesting aspects of models such as Paytner's Domination and Resistance Strategies cannot be answered for the old North district without further archaeological research. Especially interesting is the question of how the original colonists fared in the atmosphere of homeland domination suggested by the takeover of the pearling and pastoral industries.

Investigating the northwest social system through its expression in the built landscape is clearly an area where archaeological research both in the form of survey information and excavation data has a role to play. Historical information on people and their social system is patchy with even population statistics such as the census information containing significant biases, leaving large sections of the northwest population out of the count. Information is heavily biased towards the white population and in particular the white working male, a lament heard before in historical archaeological circles. For the northwest, this bias is significant as the ignored ethnic population vastly outnumbered the historically traceable white population.

The Social System: Town Development and Layout

Census information exists on the number of buildings, materials used, size and the number of people in different sized structures, but the information varies widely from census to census and cannot on its own be used to build up a picture of the built environment. Town plans showing building location are extremely rare, so more detailed historical information relies heavily on lot ownership, which does not necessarily reflect lot occupation, photographs and oral information, the last two of which both tend to be confined to the towns at or after the turn of the century.

The same is true of the location of ethnic areas within the towns but with these avenues of information being much more vague and insubstantial. Archaeology has a vital role to play in the meaningful investigation of the northwest social system through its expression in the built environment.

Cossack

1863–1874: The Early Years

The port of Cossack is situated within Butcher's Inlet beside a small natural beach backed by higher ground. At this point, a rock shelf is located between 25 and 40 cm depth under the sand (Nayton 1990b), and this probably accounts for the apparent inability of the mangroves fringing the rest of the inlet to colonize this small stretch of sand (Nayton 1990a). The same situation occurs at Rocky Point just to the east; however, at this point a layer of sand does not cushion the rock, making it less suitable for a landing place. Coastal swamps and mangroves surround the town site on all sides; however, the site itself is a long narrow stretch of higher ground that backs onto the landing beach. Coastal vessels of the time were small enough to enter the inlet and anchor off the landing area, but they could not navigate any further up the Hardy River.

The port was called various names, but the settlers made a distinction between it, the place where their goods were unloaded into flat-bottomed lighters and Upper Landing. This was the limit of navigation on the Hardy River by flat-bottomed lighter where they had only 100 yd (90 m) of marsh to cross to reach firm ground rather than the 12 miles of marshes crossing from Cossack entailed.

People were unable to settle at the port until the problem of a permanent water supply had been solved. Freshwater was eventually found 300 yd (270 m) from the shore, but the port remained an empty beach until the wreck of the *New Perservance* in January of 1867. The beached hulk was used first as a government store, then rapidly additional functions of police station and gallon licence were added as the first real pearling summer season in 1867/1868 attracted a rush of people from the south (CSO 603:1867, CSO 646:1868).

Once the pearling rush had been triggered by Hall's successful shipment of shell (CSO 654:1867), the numbers involved in the industry quickly climbed. There were 14 boats and 126 pearlers, two thirds of which were Aboriginal divers in 1869 (Inquirer 14/3/1869), and by 1871 there were 75 Europeans, 350 Aboriginals and the first Malays (Census 1871).

The Aboriginal people in the Hardy River area were already incorporated as shepherds and servants into the pastoral industry. Aboriginals were employed under the Master and Servant Act 1868 (*An Ordinance further to provide summary remedy between Masters and Servants* 1868 [32 Vic No 8]), which institutionalized imprisonment and occasionally a flogging for running away and allowed them to be paid half rations instead of cash. Aboriginal resistance to this situation appears to have

been to disappear into the bush only to be imprisoned when found again. Although initially using the same act the labour relationships in the pearling industry resulted in conflicts and official records are peppered with reports of abuse, with early concern especially centering on the treatment of women and children.

The amount of official concern shown by both the colonial and Dutch East Indies governments over the pearlers treatment of their workers suggests strongly that they had established very unequal master–worker relationships within the pearling industry and were much harsher to their divers than the pastoralists were to their shepherds and servants. However, many of the pearlers were also pastoralists, and it seems strange to suggest that they changed their attitudes with the workplace without any particular reason.

The reason may have been a greater resistance on the part of Aboriginal people to working in the pearling industry. The Aboriginal people in the Hardy River area appeared to have been reasonably tolerant of the situation within the early pastoral industry and were quickly incorporated into the system. This is unlike their neighbours in the Ashburton and De Grey river systems whose hostility to the colonists had largely foiled successful colonization. They appear to have been less tolerant of pearling, and even government documents record that they did not participate willingly. The pearling industry engendered active resistance by the Ngarluma, Jaburrara, Kariyarra, Yindjibarndi and Martuthunira peoples, and the first murders by Aboriginals and retaliation by colonists in the Hardy River area were recorded on the Burrup Peninsula in 1868, during the first full pearling season (Withnell-Taylor 1987:118).

Official and unofficial accounts such as letters home indicate pearlers used force and coercion to make indigenous people dive for pearl shell. Reports of kidnapping and "rounding up" indigenous people pepper early accounts (CSO 36/646/89 28/12/1868, 646/153/24/2/1869; Inquirer 3/3/1869), and there was a "blackbirding" slave camp on the Lacepede Islands in the 1880s. Although government attempts at regulation appear to have had little effect on these pearler practices, the pearler's strategy of physical domination of their Aboriginal workforce appears to have worked. Murders by Aboriginal people are confined to the first few years of pearling, and by 1879 even the more hostile Aboriginal groups of the Ashburton and De Grey rivers had been subdued to such an extent that pastoral settlement of these areas was then possible. By 1881, the pearlers in Cossack appear to be confident enough of their Aboriginal workforce that they did not need to physically prevent them escaping, so, therefore, their camp could be conveniently tucked out of sight behind the hill at the back of the town (Nayton 1991; Paterson 2003).

The death rate among Malay divers was very high, but there is little in the historical documentation to suggest how they tried to better their conditions in the northwest. They may, however, have lobbied their own government as the Dutch East Indies government did pass laws designed to help divers contacted to the pearling industry and effectively enforced them. To the extent that the level of Malay divers employed in the northwest dropped from 989 in 1875 to 9 in 1876 before the numbers crept slowly upwards again.

The pearlers and their workers left few traces in the historical records of the early town. The first structures noted are the first jetty and the Knight and Shenton

store both built in the 1869–1870 season with the store being shown on the first town plan (Fig. 4.1). The Inquirer (3/8/1870) adds that there were "several small habitations little better than Mia-mias." The pearlers are likely to have lived in these huts or in tents rather than on board as their boats beached at low tide, tipping the decks at a sharp angle.

Only three lightly constructed houses (one being an unofficial public house) are mentioned by Scholl in 1872, all on a sandy ridge formed by a dune lying across Lots 123–139 (CSO 714:1872). Yet, signed petitions suggest that between 30 and 40 men lived in the town probably in the huts and tents reported by the Inquirer. A combined government bond store, courthouse, customs house and tidewaiter's house was located on the lots fronting the eastern side of Pearl Street (106-7 and 124-6), which remained in government hands.

Chapman was running an unofficial hotel from his house that finally gained a licence in 1872. Chapman brought Lot 121, but the historically known Weld Hotel, which was run by the Chapman's until the early 1890s, was built on Lot 120 owned by Fred Pearse. This gives two possible locations for the 1869 hotel. The archaeological evidence, however, suggests that Lot 121, not 120, was the site of the unofficial hotel. PWD 39 (Fig. 6.1) shows a building sitting across the junction of lots 121, 122 and 123 in 1886. The siting of the building across three lot boundaries suggests that it was an early structure built before the boundaries became defined in 1872. An archaeological survey conducted in 1989 (Nayton 1990b) revealed that this area was also the part of town most affected by bottle hunting, the site being known as one containing high numbers of early bottles.

In February 1871, David Stewart was granted a licence for the White Horse hotel. He built an eight-room weatherboard and iron hotel with a stockyard (CSO 714:1871). The two hotels were probably the largest buildings in the town at this time.

Other activity at this time comprised the repairing of the road to the port by the new Roebourne Road Board, the arrival of beacons for use in Butcher Inlet and Howlett buying anchors and chains for moorings (CSO 714:1872).

The Knight and Shenton store was the first substantial building in Cossack. The building was described in 1872 as being "of weather board mahogany with shingled roof with a verandah" (CSO 714:1872). The "mahogany" used was Western Australian jarrah shipped from the southwest. The store was unroofed and the verandah blown down during the 1872 cyclone but, since it was on a sand ridge, the building was not affected by the cyclonic storm surge that flooded Howlett's store, which was built at the foot of the ridge.

McRae and Co. purchased Knight and Shenton's store as a branch store in January 1872 (Inquirer 7/2/1872) with plans to build a warehouse to service the store. Figure 6.11, which does not contain the distinctive roof of the 1883 post office, shows a building between the store and the jetty. This building is closer to the 1870 store building than Howlett's store was and indeed is closer than the stone store that superseded it. The building may have been the first McRae & Co. warehouse.

The store was built before any town surveys, and so its location was not constrained by imposed lot boundaries. The 2–3 m difference in ground height between the building and Pearl Street to the east and the gentle slope of the land

between the foot of the ridge and the inlet identifies the building location as being at the very end of a back beach dune that stretches to the southwest longitudinally between Perseverance Street and The Strand. The dune is the nearest piece of elevated ground to the landing beach. The store's location places it inland of and slightly to the west of the New Perseverance hulk and the landing place in 1870 (Fig. 4.1). Archaeological evidence suggests this location also placed the store closer to the landing place than Chapman's unofficial hotel built earlier in 1869. The evidence suggesting this building was located close by on the same dune but across the southern corner of the store lot rather than adjacent to what would become a main street in the town.

Loftie's sketch (Loftie 1872) indicates Cossack's second store (Howlett's) was built on the lot in front of the Knight and Shenton store at the foot of the ridge directly on the crossroads formed by the landing place, Pearl Street and The Strand. Its low-lying position left it open to flooding during the 1872 cyclone. This may have contributed to the demise of the store, which appears to have been a very short-lived structure both from the scantiness of archaeological evidence and its disappearance from mention in historical documentation. The town's second hotel (The White Horse) was also built on the sand ridge but further away from the crossroads than the stores and original hotel. All the retail buildings were, however, on the main route between the landing place and the inland town of Roebourne. The government claimed the other side of the crossroads for their own purposes, building a bond warehouse there above the height of the 1872 floodwaters.

This archaeological and historical evidence points to the first town nucleus of stores, hotels, the government bond store, the hulk of the *New Perservance* and the adjacent jetty forming around the landing site. This nucleus contains all the functions found in a level two southwest port (Table 3.1), level two being the level where services first start to coalesce into a recognizable town area. Apart from customs, stores and hotels, by 1873, there were five ship's carpenters, two accountants and a boarding house followed in 1874 or 1875 by Hall's more specialized ship's chandlers store, which operated until 1887 (Hall 1887; Wise 1874).

The locations of buildings within this original town nucleus including that of Knight and Shenton's store are clearly governed by bid rent relationships. They also show a process of learning as later builders did not repeat Howlett's mistake of building off the sand ridge. A move sensible in terms of bid rent values, the store closest to the landing place being in the better trading position, but was not sensible environmentally. The town subdivision was also influenced by bid rent relationships with the surveyor creating the town layout around the location of the landing place and the adjacent hulk of the *New Perseverance*. This placed the two stores beside Pearl Street on the extreme edge of the western block of subdivisions.

Table 6.2 demonstrates that it was the same small core of business people who lived within the town during this early period. The Chapmans, Phillimore, Best, Stewart and McRae & Co. were in the town early with nine others joining them in 1873 and the Hall family arriving in 1874. The arrival of Mrs. Hall meant that there were now two women and some children in the town. Confirmed private settlement is confined to the lots fronting the Strand between Pearl and Douglas

Table 6.2 Early Cossack residents

Date	Location	Name	Occupation
1868–1870	New perseverance	–	Water police
1870–1887	124–125	–	Police and water police
Ca. 1870–1875	119	H. Best	Ship's carpenter
Ca. 1873–1875	–	H. Butt	Ship's carpenter
Ca. 1873–1879	–	R. Blackhall	Accountant
Ca. 1872	–	Capt. Cadell	Pearler
Ca. 1868–1888	121 and 120	D. Chapman	Hotel and pearler
Ca. 1873–1874	–	R. Dunkley	Ship's carpenter
Ca. 1873–1879		L. Gould	Accountant
Ca. 1874–1884	116	W.S. Hall	Ship's chandler and pearler
Ca. 1872–1874	122	Howlett and Crouch	Storekeepers and pearlers
Ca. 1870–1871	123	Knight and Shenton	Storekeepers
Ca. 1872–1892	123	McRae & Co.	Storekeepers and pearlers
Ca. 1869–1872	Briefly 123	W. Miles	Pearler and briefly storekeeper
Ca. 1870–1888	120	F. Pearse	J P & merchant
Ca. 1873–1884	146–147	A. Pead	Ship's carpenter and merchant
Ca. 1872–1879	–	R. Phillimore	Boarding house
Ca. 1873–1879	–	A. Smith	Ship's carpenter
Ca. 1872–1873	130	W. Williams	Pearler
Ca. 1872–1884	119	D. Stewart	Hotel and pearler
>1872	124–125	Mr. Wynn	Tidewaiter, postmaster, clerk and customs

streets with the whereabouts of nine men unknown. As the confirmed settlement included two hotels and a boarding house, most of those people were probably also living between Pearl and Douglas streets.

Six of the eight lots had combined commercial/domestic functions with two lots belonging to J. Best possibly unoccupied. Retail functions occupied one side of the prime crossroads near the jetty with the government on the other. Hotels and a boarding house took up the next lots with the latecomer Hall with his mainly domestic occupation relegated to the outskirts of the occupied area. Archaeological survey of the surviving surface features in the area showed that the central part of these lots are rich in pre-1892 bottle middens but that the buildings shown in 1886 have been replaced with a network of paths and secondary buildings (Fig. 6.4).

Census and other sources of historical information indicate that all the buildings in Cossack were built of wood except for Howlett's store, which was of iron (Inquirer 1872). There was no attempt to build in rammed earth, sun dried bricks and stone mortared with clay. The colonists appear to have well learnt from their painful experience in Roebourne in 1868 that such materials were particularly vulnerable to cyclones (CSO 528:1866). They had also learnt by trail and error to

Fig. 6.5 Photograph of Cossack taken from Nanny Goat Hill pre 1883. 4054B/1: Courtesy State Library of Western Australia, The Battye Library

dig only shallow wells well away from the beach to obtain freshwater at Cossack as the port has a thin lens of freshwater sitting over salty. However, in a reverse of the process of learning articulated by frontier theories such as the Swiss Family Robinson Model (Birmingham and Jeans 1983), these wells were actually ruined in the town's dying days by new residents trying to improve the wells without asking the advice of the few remaining old-timers (De La Rue 1979).

Figure 6.5 is a photograph of Cossack taken prior to 1883. It shows there were two parallel roads; Perseverance Street at the rear and the Strand between the town and the inlet with a sand ridge between running parallel to the roads at approximately mid lot position. The photograph shows the buildings set well back on this sand ridge except for one building near the jetty on Lot 122. The position of verandas on the buildings suggests most faced the inlet and the Strand rather than Perseverance Street. However, the only buildings on the lots near the Strand are very small and were reported to be toilets (Owen 1933:55), which is also suggested by their size and the absence of paths leading from them to the Strand. The Strand surprisingly follows the surveyed road reserve, despite the fact that this placed it along the top of the beach with at least one area inundated by every tide.

The photograph also shows a concentration of buildings between the top of the mid lot sand ridge and Perseverance Street (which joins the Strand at the edge of town just out of the range of the bottom edge of the photograph) and a lack of connections between the buildings and the Strand. This suggests that Perseverance Street functioned as the main street of the early town, while the Strand functioned

purely as an occasional link between the port and Roebourne. This is slightly at odds with frontier theories such as Lewis (1985) and port studies such as Bird (1971), which although predicting settlement and centralizing functions along one road state that road would also be the main route through the town.

The main route out of the town was intended by the government to be the Strand, which established the shortest route between the Cossack Jetty and the inland town of Roebourne. However, the Cossack settlement, while a one-row settlement similar to the form predicted by Lewis (1985), was focused by geographical factors on the more useable Perseverance Street, which is likely to have also had a dual function as a route out of town at those times when the Strand was impassable. The situation of a port that has its waterfront road literally underwater twice a day is unusual at best and, therefore, not covered by port studies or archaeological models. It is, however, very indicative of a colonial government mindset that imposed grid layouts on sites unsuited to them. Perseverance Street also suffered from this government mindset with part of the road reserve located over a sheer rock outcrop, which the more practical northwest colonists simply went around.

The non-pearling section of the urban population lived in multipurpose buildings with even the government structures being multipurpose. Government officials at the port held down several unrelated positions such as tidewaiter and postmaster, and both the hoteliers and storekeepers were also pearlers. Such multifunctionality is predicted by Lewis's Frontier Model (1985). The two accountants are somewhat of an anomaly. They were not directly associated with Cossack's trade function, and accounting is a higher level function that the study of southwest centrality in Chapter 3 would lead one to expect in a town of this size. However, they appear to be a short-lived anomalies and were gone from the port by 1880.

As Chapter 5 points out the northwest colonization was very much a clinal frontier. In this situation, Paynter (1985) suggests that the elites will be concentrated within the town and would maintain their elite positions by being associated with the transport of surplus away from the frontier. At this early stage, almost all the male population were either regional elites or tradesmen or pearlers with the non-pearling population being either storekeepers/coastal traders, hoteliers, accountants or ship's carpenters. The commercial urban elites were split evenly between service and transport related elites. The government presence is in the form of a tidewaiter/clerk and police constables both of which are lower echelon government officials.

Money was spent on the early town by pearlers for accommodation and by regional elites providing centralizing services for a small port. Government money (ultimately British government money) was utilized to improve surplus transportation out of the region and into the British trading network with a causeway, harbour improvements and the charting of the coast following quickly after the start of the pearling industry. The Western Australian colonial government did not initially benefit directly from the pearling industry; however, they wasted little time in establishing direct benefits by passing the *Northern Districts Special Revenue Act* 1873 (37 Vict. No. 10, Cls 5. 9.12), which effectively established rent payments in the form of customs duties and licences. Payments, which the historical records indicate the pearlers tried to avoid paying by not informing the Resident Magistrate of their activities (Blue Books 1868–1880).

If power is expressed in land ownership, manipulation of the environment and unequal power relations backed by law between elites and workers, then at this stage the pearlers are not particularly recognized as regional elites. During this time period, pearling was carried out by beachcombing or by skin diving from small boats, and consequently very little capital was needed to participate. Profits made from pearling had not been translated into land, buildings and manipulation of the environment by 1874 with the result that the homes of both the pearling masters and their workers are virtually invisible in historical documentation and to archaeological survey.

For master–worker relationships, the pearlers were utilizing the same law as the pastoralists with regard to Aboriginal workers and were making individual contacts with Malays before bringing them to Australia. However, the amount of official concern shown by both the colonial and Dutch East Indies governments over the pearlers treatment of their workers suggests strongly that they quickly established a very unequal master–worker relationship within the pearling industry. This domination is their only recognizable elite trait at this point. It represents not so much a change in the northwest social system but an exaggeration of the white dominated social relations already established by the pastoral industry.

There is a recognizable landscape pattern in the northwest that follows that for the southwest of a focal area of homesteads that share centralizing functions (Level 1) followed by a move into a recognizable urban area of a store, public house and some sort of government presence (Level 2). In Cossack, this is the 1870–1874 nucleus of police/warehouse (*New Perseverance*), hotels, stores and jetty. This differs from the southwest by the warehouse being a government owned customs warehouse rather than a private warehouse located in a hotel or store. Geographical factors in both regions lead to the formation of sister towns, a port and the administration centre, but the factors were different for each region: In the southwest being lack of fertile soil near the coast and in the northwest the presence of extensive fringing mangrove swamps and lack of permanent water sources.

The town layout, as in the southwest, is similar to that of the primitive stage of the *Anyport* model (Bird 1971) with one jetty and a section of beach backed by roads running both at right angles and parallel to the beach, which join up to the main road out of town. In the *Anyport* model, the road inland is transverse to the waterfront as the town is situated at the head of the estuary. Cossack is situated on one side of the estuary as the waters at the head are very shallow; the road inland, therefore, runs along the town beach front rather than at right angles away from the water. The port does contain a customs house and a transit shed near the jetty, in this case combined in the bonded warehouse. At this point in time, the port of Cossack had not developed longer-term storage facilities.

Even at this embryonic township stage, bid rent relationships can be determined. The high bid rent functions of government and retail dominate the centre of the town, monopolizing the crossroads adjacent to the jetty. The lower bid rent functions of hotel and boarding house were next to the core area on the main route out of town with the Hall family's home on the outskirts of town.

However, the attenuation of the settlement system noted towards the end of Chapter 5 extends to attenuation of services within the towns (Table 6.3). Most

Table 6.3 Central place functions and population levels in the southwest and northwest

Hinterland pop	CPF southwest	Hinterland pop	CPF northwest
Ca. 50	Police/customs	Ca. 66	First store
	Carpenter		First warehouse
	Wheelwright Blacksmith		
	First store		
	First warehouse		
Ca. 66	Hotel	Ca. 148	Police/customs
	Church		Resident magistrate
			Carpenter
			Blacksmith
			Mason
Ca. 74	Post office	Ca. 156	Hotel
			Post office
Ca. 133	Additional stores	Ca. 172 + 250 pearl divers	Additional stores
	Additional warehouses		Additional warehouses
	Additional hotels		Additional hotels
	Teacher		Boarding house
			Teacher
Ca. 149	School	Ca. 326 + 800 pearl divers	School
	Resident magistrate		Police station
	Police station		
	Jail		
	Mill		
Ca. 500	Doctor	Ca. 500 + 1,293 pearl divers	Doctor
	Mechanics institute/hall		
	Boarding house		
–	–	Ca. 600 + pearl divers	Clergy
			Painter
			Brick maker
			Jail
–	–	Ca. 700 + pearl divers	Church
			Mechanic institute/hall

services appeared in the northwest at higher population levels than their appearance in the southwest. This is particularly noticeable with religious functions, which appeared surprisingly early on in the southwest and were basically concurrent with the timing of government functions. However, not all early southwest towns boasted an actual church until level three. All, however, had someone to give services, and at a relatively early stage this was a clergyman.

In the northwest, this person was Resident Magistrate Scholl who gave sermons in Roebourne, buried the dead and could perform a non-church wedding (Withnell-Taylor 1987:89). Although a clergyman did visit the northwest for a couple of

months in 1878, there was no one permanently stationed there until 1879 and a church was not built for him until 1882 (Withnell-Taylor 1987:144).

This is different from the southwest where the church was very active even in extreme frontier conditions. In 1881, Roebourne was on the verge of becoming a level four town, but it was only at that level it gained a clergyman and a church. Cossack throughout its history never gained either. The area population needed for this level of church function in the northwest was approximately 600 people, while in the southwest only 150 was needed to attract clergymen to regional nodes.

Boarding houses are the only service in the northwest that go counter to this attenuating trend. This reflects the seasonal and inter-regional nature of the pearling fleet that has no direct parallel in the southwest.

The historical evidence for the location of people and services within the pre-1875 port ignores the pearlers, who were camping casually within Cossack. This is because historical evidence is insufficient to determine decisively where they were camping and archaeologically sample excavations across the Townsite would be required to isolate early camping areas.

In 1874, there were 111 men involved in pearling (CSO/809/73), but many were migratory rather than resident and did not stay in Cossack. According to Governor Weld, by 1871 there were 75 Europeans, 59 of who must have been purely pearlers, 350 Aboriginals and a few Malays in Cossack (WAA, RN 495). This gives some idea about relative numbers with the pearlers obviously swamping the tiny urban population. By the end of 1872, the number of Malays had reached 130 according to the Inquirer (27/10/1872) adding further to this bias.

Yet, historically, little is known about the location of the pearlers. Historical information on the location of white pearlers is limited to two land purchases and a vague reference to their location by the Governor Resident. Lot 130 was brought in 1872 by W. Williams and Lot 133 by C. Tuckey in 1875, both of whom were pearlers. However, the lots lie in different parts of the town, one being on the slope to the east of Pearl Street and the other lying to the north of Perseverance Street and west of Douglas Street. Neither lot had a house on it in 1886 (Fig. 6.1), but Lot 130 was at least inside the limits of 1886 settlement, but not Lot 133. There is, therefore, little to link either lot with the camping area other than their purchase by a pearler.

Other possibilities for the camping area are on a ridge or the beach as Sholl refers to pearlers being on the beach (CSO 714:1872) and to people being on a ridge. The only ridge shown in early plans is that across lots 108–110, but subsurface sampling of the area eliminated it as the camping ground (Nayton 1990b). During the archaeological survey of the town, it was realized that there was a long back beach dune lying across the centre of lots 121–139, which started in the front portion of Lot 123. This creates a long sandy ridge that may have been the area Scholl meant. Certainly, this ridge became the focus of the early urban settlement, but excavation of areas of Lot 123 for this research revealed no occupation earlier than the 1870 store, eliminating the end of the ridge close to the landing beach as the camping area. This suggests that the rest of the ridge, which would have been further away from the landing area and their boats, is unlikely to have been the camping ground.

The landing beach was also subsurface sampled. It was found to be shallow, underlain with rock and containing little cultural evidence (Nayton 1990b) despite being the location of the first town structure (the *New Perseverance* hulk). The beach is very shallow and is vulnerable to cyclonic tidal surges. These events are likely to have periodically removed sand and artefacts from the area, leaving it archaeologically sterile despite having been the focus of the port's activities.

The other beaches within the town site are covered with mangroves, much as they were in 1872 (Fig. 4.1); any camping would have to have been inland of the mangroves. However, the low-lying area west of the landing beach between the mangroves and the sandy ridge was marshy and subject to flooding before the sea wall was built in 1888 and is an unlikely camping area. The pearlers are much more likely to have been on the long sandy slope to the east of the landing beach. This area has only been surface surveyed with some limited sampling carried out at the top of the slope in Lot 131. This sampling was to locate an 1886 building, not the camping ground (McIlroy 1990), however; no evidence of either was forthcoming.

Some further archaeological test pitting has been carried out in the area east of Pilot Street in an effort to locate Chinatown, which historical evidence locates at the edge of eastern settlement at the turn of the century. Most of the area is basically a long sandy slope from Rocky Point, which juts out into the inlet to the foot of Mt Beach. There are two back beach dunes between the inlet and the hill, one down the centre of lots 148–152 and the other lying between the lots and the cemetery (Fig. 6.4).

The archaeological investigations (McIlroy 1988) found European and Asian sites in this area. The sites all included rock rubble, which was how they were identified as possible sites during the survey (McIlroy 1988). There is not enough rock for the huts to have been of stone, but alignments suggest the edges of tents may have been held down with stone.

The sites appear to fall into two overlapping occupations with the European sites mainly to the east of Lot 151 and the Asian sites lying mainly to the west of Lot 150. The shovel test pitting sampling technique used (McIlroy 1988), sampled the artefacts at a location but did not result in removal of artefacts in chronological layers. Dateable artefacts are, therefore, mixed, and it cannot be determined from the available evidence whether the European sites belonged to early pearlers, to later Europeans or are the result of Asian activities that utilized European artefacts.

Historical evidence for the location of the early Malay divers comes from the Inquirer that states both Cadell and Howlett housed their Malays in wooden huts (Inquirer 27/10/1872). Such a practice if followed by the other pearlers is likely to have resulted in a series of pearling camps each with pearlers and pearling workers. Howlett had about 10–12 Malays working for him in 1872 housed in one building. This hut is quite likely to have been the building shown on Loftie's sketch next to the store. There is no indication whatsoever of where Cadell's hut was.

One of Howlett's buildings was test excavated during the fieldwork, revealing a limestone floor covered with a very minimal deposit. Nothing in the deposit indicated the presence of Malays, and it is unknown whether the building was the store or the hut (Nayton 1990b). Evidence of Asian culture found during the archaeological surveys (McIlroy 1988, 1990; Nayton 1990b, 1992b) could all

be related to later known occupations; no evidence was found in unexpected areas that may have been related to this earliest period of Asian participation in the pearling industry.

There is no actual historical evidence to suggest where the Aboriginal pearling population was housed except for a newspaper report that said they freely "mingled with the whites in the port" (Inquirer 3/8/1870). They were located in a camp behind the hill near the stock wells by 1881 (McIlroy 1988:52), and this was located during the Knight and Shenton store excavation field season (Fig. 6.4). The site was not test sampled, but glass artefacts on the surface suggested late nineteenth century occupation. It cannot be determined, however, from the available evidence, whether this occupation extended back earlier than 1881.

The Cossack fringe sites were surveyed in 2003 (Paterson 2006), and functional analysis of surface collected material was carried out as an honours dissertation (McHarg 2006). Dating of sites CSK-A3, CSK-A4 and CSK-A5 with artefact ranges adjusted to take into account the date of settlement in the northwest give rounded mean dates of ca. 1892, 1883 and 1887, respectively (rounded to whole year numbers from McHarg 2006:126–129), putting them in the period when the pearling industry was at its height at Cossack. McHarg has some questionable artefact identifications but a reanalysis of her material using the raw data of artefacts recovered does not significantly alter her mean dates from the 1880s to 1890s period for three of her four sites. However, McHarg has a date of 1860 for CSK-A6 based on only two artefacts, one of which at least appears to be wrongly identified as a bottle base type dating from 1830 to 1870, whereas the photograph supplied (McHarg 2006:72) suggests the type is a molded bottle with a post bottom cup dating from 1900 to ca. 1925. It cannot, therefore, be confirmed that this particular site dates to an earlier date than the other sampled sites around the fringe of Cossack.

To sum up, therefore, there is no definite proof of where the bulk of the port population was camping during the early years of pearling. The archaeological and geographical evidence suggests that the white pearlers are likely to have been living mainly on the long slope to the east of the landing place, possibly near Rocky Point. The historical evidence suggests that at least at first, the Malay divers were accommodated in camps alongside their pearling master and then later in a separate enclave. Aboriginal divers may have also been kept in the same camps during the season but by 1881 were housed separately in a camp behind the hill to the west of the township. The evidence suggests the sampled archaeological sites of CSK-A3, CSK-A4 and CSK-A5 (Fig. 6.4) are part of this fringe settlement of Aboriginal people during the 1880s, early 1890s hay day of the pearling industry at Cossack.

As the pearlers and their workers represented the bulk of the town population, this absence biases any locational analysis of the early town. We do not really know where they were, how they lived, what they built, who they lived near or if they were affected by such things as bid rent and other socio-economic forces. This leaves a rich field of research for archaeology, particularly for archaeological excavation as a major tool for investigating the early town.

1875–1881: The Growth of a Pearling Port

This period is a time of growth and flux in Cossack's population when the town grew to a level three category town (see Table 3.1). The post office directories for the period suggest the historically visible population is more fluid by 1880, with only six remaining of the 1870s core. These were the two hoteliers, McRae & Co., Pearse who had joined McRae & Co., Hall who was pearling by this period and Pead who had changed occupation to a merchant and shipping agent. These people and their families were forming a small core of old-timers within a growing number of new people. The number of people associated with hotels or trade rose from 8 in 1875 to 20 in 1880. Small-scale technology became more visible with carpenters, blacksmiths, a mason, a painter, a brick maker and a goldsmith (Wise 1880).

The white pearling population within the town stood at 44 in 1880. The numbers of Malays and Aboriginal people in the pearling industry fluctuated wildly. There were 989 Malays and 493 Aboriginals working in Cossack vessels in 1875 and virtually no Malays in 1876. The 1881 census recorded 229 people in Cossack, 15 of which were Malays and 16 Chinese. Not included in the population count were 335 male Aboriginals and 16 female, including them gives Cossack a population of 580.

It is unlikely that all 580 were crowded onto the 37 town lots sold by this date. The presence of an Aboriginal camping ground to the west at the back of the town is recorded in the Cossack Police Station records of 1881 (McIlroy 1988:52), and it is likely that, by this time, at least the 335 male Aboriginals resided separately from the pearling masters in the fringe camps (Fig. 6.4) documented during 1991 (Nayton 1991) and 2003 (Paterson 2003).

There is an extensive directory of Asian immigrants to Western Australia in the nineteenth century (Atkinson 1988). However, when the number of people who can be traced to Cossack is calculated, there are huge discrepancies between the immigration information and totals from census and Blue Book Records. There is no trace of the large numbers of Asians employed in the pearling industry in the 1870s. A Japanese domestic servant on a pearling vessel is the only Asian traceable to this decade (Atkinson 1988; McIlroy 1988:43). The earliest Asians who can be firmly located to Cossack are a Chinese shop assistant at McRae and Co. and a Malay pearler, both present in 1881 when the census records 31 Asians in the township.

The pearlers originally sailed to Asian ports and made their own arrangements with workers and such informal arrangements appear to be harder to trace historically than the formalized trade with Singapore, which started as a result of the change from sail to steam. There is no archaeological evidence that suggests these people were living outside of the area that later came to be called Chinatown, however. The archaeological evidence available from the Chinatown area (McIlroy 1988) is not refined enough to determine when the enclave was first established. However, it was established enough to have its own shops by 1883.

The 1881 census does not record any tents in Cossack suggesting the pearlers had moved out of the camping ground, and indeed the period between 1875 and 1881 is marked by pearlers establishing themselves within the town in a way that makes them visible in the historical documentation. About one quarter of the

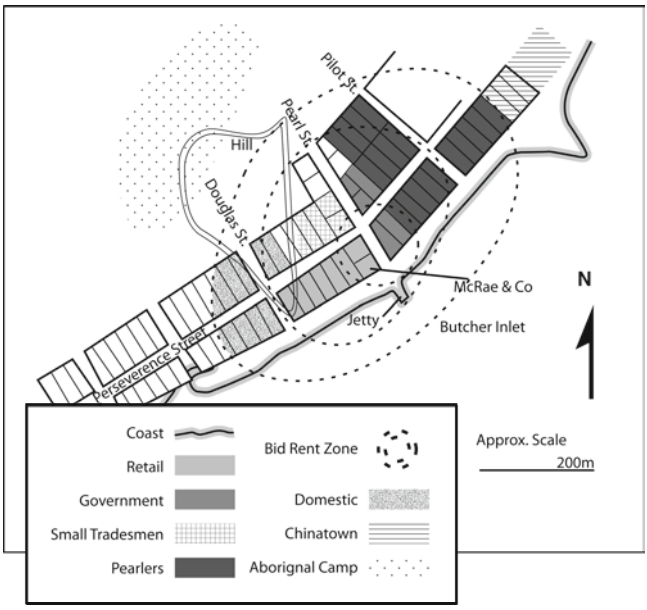

Fig. 6.6 Cossack bid rent zones

northwest pearlers lived in Cossack and formed a visible block of urban elites within the town (Fig. 6.6). Zoning is visible within the town site with the highest value central zone near the jetty occupied by the government and McRae and Co. The next zone out contains the other commercial and service functions to the south of Pearl Street and all bar one of the pearlers on the northern side beyond the government enclave. The third zone contains the rest of the white urban population with the Asian and Aboriginal populations outside of that.

Both Asian and Aboriginal groups had been marginalized, but the treatment of them differs. By 1881, the Aboriginal camp is outside of the town boundaries, close but out of sight of the main town area. The Asian enclave is pushed to the edge of town but is very much in sight. The government, pearlers and both ethnic groups are all within enclaves within their zones with the pearling enclave appearing divided into upper and lower elites with the upper elites situated on the higher ground to the west of Perseverance Street.

Government enclaves are not unexpected, neither are the ethnic clusters. What is unexpected is the clustering and location of the pearlers. Who, as emerging social elites, would have been expected to have expressed themselves in a sector development spreading away from areas of lower bid rent values, poor or ethnic enclaves and spreading up any convenient hill in their sector. Bid rent relationships would have been expected to keep the pearlers out of the Strand central business area ribbon development and the government enclave but would not have precluding them from outbidding the embryonic ribbon development of small tradesmen on Perseverance Street. Their choice of settlement in an enclave between the town and

a poor ethnic enclave is more easily explained in terms of domination and resistance strategies (Paynter 1982) than urban locational theory.

The domination strategy of building higher and looking down on those you wish to dominate is a strategy of industrial capitalism. It was used by both business and government in the late nineteenth century and was certainly used in the southwest. For example, the Fremantle Roundhouse Prison crouched over Fremantle and was visible from both the port and High Street. Likewise, in Albany a high status area spread up the slope of Mt Melville, but the mansion occupied by the manager of the P&O depot was on Mt Clarence directly overlooking the depot (Garden 1977). The people who built in the best positions to overlook the Asian enclave were McRae & Co., Francisco, Tuckey and Pead, all with pearling interests but with McRae & Co. and Pead becoming recognizable as more dominate elites with diverse interests.

The archaeological survey evidence suggests that the Asian workers as they grew in numbers were confined to the enclave on about 400 m of sand. This compares rather unfavourably to the approximately 1,600 m claimed by the small white population. The location of the enclave in the lowest bid rent position within the town boundaries (it was on the opposite side of town from the main transport route and next to the cemetery) also suggests domination as does the lack of Asian land or business owners. At this stage, only one man appears to have challenged this domination successfully by becoming a pearling master in the 1870s.

It is clear that in 1881 Cossack is still basically developing as a two-row town with the densest settlement along Perseverance Street on the main practical route inland from the town. Some grid development was starting to take place along Pearl Street but this appears to be confined to the domestic housing of the pearling settlement north of Pearl Street. Small-scale technology such as blacksmithing, shipbuilding and carpentry is also visible by 1881 with an embryonic ribbon development along Perseverance Street to the south of Pearl Street.

There is still a high level of multipurpose use of buildings and individuals holding down more than one function within the urban population. This situation extended to the pearlers living in the town, half of whom combined pearling with another occupation. However, the urban elites of this period appear to be less homogeneous than the previous period with the partners of McRae & Co., Pead and Hall with his pearling and land leasing interests forming an upper echelon. The housing of the pearling elite was also not multifunctional and they formed the first group in the town to establish purely domestic houses.

Town layout patterns can be determined and by 1881 Cossack was a level three town (Table 3.1) with basically the town layout and levels of services expected from the study of southwest patterns for a town of this level. It was double the size of Roebourne with discernable zoning, a shopping street ribbon development containing the stores and hotels between Pearl and Douglas streets a non-retail service ribbon behind it on Perseverance Street and domestic housing located on the fringes of the central area.

Pearling as shown in Chapter 5 was very lucrative and during this period was largely in Western Australian hands. About half the Western Australian pearlers lived in the northwest, and about half of this number was based in Cossack as

opposed to Roebourne or the pastoral hinterland. Pearling surplus was beginning to accumulate to the pearlers themselves, resulting in them buying land and building houses and, unlike the initial years, there is now a clearly seen archaeological distinction between the pearlers and their workers.

The layout of the town in 1881 shows the traits of social Darwinism inherent in industrial capitalism with strong patterns of domination, by whites over ethnic groups and by pearlers over their workers. Both Asian and Aboriginal groups have been marginalized, but the treatment of them differs. By 1881 the Aboriginal camp is outside of the town boundaries, close but out of sight while the Asian enclave is pushed to the edge of town but is very much in sight. The different treatment of the groups suggests different management strategies, and it appears from the historical information that the pearlers adopted a strategy of physical domination with their Aboriginal workers and from the evidence of the archaeological survey information a different strategy of visual and physiological domination with their Asian workers.

There is very little in the historical documentation to suggest resistance strategies employed by the Asian pearling workers at this time, although the Dutch East Indies government applied some effective resistance on their behalf. In fact, there is very little in the historical information about either the Asian or Aboriginal workers apart from fleet numbers. It is, therefore, impossible to determine, without archaeological excavation, if this section of the population were engaged in a process of learning to live in the colonial dominated northwest environment, if they were employing subtle forms of resistance to the situation in which they found themselves or if they had their own hierarchical social and commercial order that conformed or did not conform to the ideals of colonial society.

The Built Environment

Analysis of archaeological survey information of building location and materials provides one window into this area of domination and resistance through the built environment. The presentation, style and location of our homes and businesses are often used to express our actual or desired social placement. This is so common that phrases such as “Keeping up with the Jones,” “living on the right side of the tracks” and “having the right address” are now part of our general vocabulary. Using scarce or costly materials or materials requiring skill to install is also part of this mindset, which uses display as one way to establish and enforce elite group membership.

A variety of building materials were tried in the northwest, but early experiments in Roebourne had demonstrated that sun-dried brick and stone mortared with clay were not suitable building materials in an area prone to cyclones. Cossack, therefore, was a town built of wood, demonstrating a process of learning to live within the environment. However, despite this, there is a discernable pattern of building with stone that is linked almost entirely with urban elites and the government.

This practice started by utilizing a drystone building technique that avoided the vulnerability of stone buildings to cyclones, as there was no poorly made mortar to

wash away. The first person to use this technique for his home was Farquahar McRae, the main partner of McRae & Co. Farquahar was both the first town businessman to move out of the central business district into a purely domestic house, a demonstration, in itself, of his elite status, and the first to create a building with dolerite drystone foundations (McIlroy 1990:74–75). As predicted by the southwest modelling, he moved into an area where other homes were being built in what was to become the pearling enclave. Pead built two homes outside the central business district between 1877 and 1884. The 1881 census indicates that the smaller completely wooden house was the first built. The second structure was much more elaborate with stone used extensively both as mortared foundations and drystone extensions (McIlroy 1990).

Pead extended the use of stone on his land in the mid-1880s to breakwaters, paths and the nearby road (McIlroy 1990). The old Knight and Shenton store building was extended in the early 1880s by the addition of an enclosing verandah supported by wooden posts and drystone foundations. A wooden kitchen with a drystone chimney with massive foundations was also added to the complex (Nayton 1990b). Nearby a beachstone foundation on Lot 122 appears to have been associated with the Union Bank agency (Nayton 1990b). Patterson, a Cossack pearler, also built a wooden house with a dolerite floor in the pearling enclave with Ellery, a pearler/carpenter probably building his small drystone kitchen on Lot 108 between 1881 and 1883 (Nayton 1991). This small kitchen may have been the first building built completely of stone in the town.

The government, however, built the much more substantial post office and customs house in 1881 followed soon afterwards by a small stone bake house. The other stone buildings in the government enclave including the imposing stone courthouse were built after this period in the late 1880s and 1890s.

While this use of stone can be traced by archaeological survey, timber buildings leave less obvious surface evidence. Therefore, there is very little evidence, except for historical information regarding the number and size of buildings, about the majority of the town's buildings. There is not even this scant historical information for buildings in Chinatown or associated with the Aboriginal fringe camps.

Historical information informs us that in 1872 the few houses in the township were lightly built. Two domestic houses and Chapman's illegal hotel were of light timber and thatch, one store was iron clad on a light timber frame, McRae's store was weatherboard with a shingle roof and a verandah and Stewarts new hotel was weatherboard with an iron roof and a detached kitchen (CSO 714:1871).

All were either blown down or had their roofs removed by the 1872 cyclone (CSO 714:1871), but there is no historical evidence for how this affected their rebuilding or the building of new structures during this period. The Governor Resident certainly took some lessons on board recommending to the colonial government that the roof of the Governor's Residence be lowered and that the location for the proposed Cossack bond store be moved further from the water to avoid cyclonic surge. Figure 6.11 is taken from too great a distance to provide much detail of housing adaptations from this period, but the houses are clearly built well away from the water. They line Perseverance Street, but the position of the verandahs

suggest that they faced the inlet either for the view or as an adaptation to the environment as the evening breeze would blow inland from the water.

They are all wooden, except for what appears to be a large tent, and the roofs also appear to be wooden. The construction of the roofs on the houses west of Douglas Street and on Lot 118 is clearly different to that of the White Horse Hotel with its iron roof and capping. The light reflecting off some of the government buildings in the distance suggests they too were roofed in iron. There does not appear to be any thatched roofs, and the wooden ones appear constructed from large sheets of wood battened down rather than from shingles, which might be an adaptation to cyclonic weather.

The style of the houses generally appears to be colonial Georgian with either hipped or gable ended roofs, many with front verandahs. This was the predominate style of building in Western Australia as shown by the analysis of southwest architecture in Chapter 2 and suggests conformity to the dominate ideology in the white population. More subtle nuances of style cannot be discerned, but there appears to be an absence of chimneys in the skyline, suggesting small-detached kitchens may have been the norm. However, this photograph is of the area to the south of Pearl Street, showing the Cossack central business district, tradesman ribbon development and the white non-pearling urban population. It cannot tell the observer if the pearling masters also were conforming to the dominant colonial ideology during this period or how their explorations in stone were expressed in the style and presentation of their houses. It also cannot inform on the dwellings of the ethnic workers located on the fringes of the town.

Figure 6.7 shows in more detail the Knight and Shenton/McRae & Co. store complex which was excavated as part of this research. The style of the original

Fig. 6.7 Detail of Fig. 6.5. 4054B/1: Courtesy State Library of Western Australia, The Battye Library

Knight and Shenton store building also appears to be colonial Georgian suggesting conformity. It is square with a steeply pitched roof and a doorway placed symmetrically in the south-western wall. There is no verandah visible from the southwest. The building in front of the store is of a similar design with a window in the south-western wall and verandahs to both the northwest and south-east. The orientation of this building is either to the beach to the south-east or to the store in the northwest. This information and the mapped location of the original store building showing its general size and shape is all that is known historically about the site layout and building design of the Knight and Shenton/McRae & Co. store complexes.

Archaeological survey or excavation can recover building layouts and determine how the various areas of a building were used. Some evidence for construction materials and techniques may also be recovered, but once a building has been pulled down and the demolition material removed much information on its architectural style and detailing will be lost. Therefore, some expressions of social relationships frozen into the built environment can never be recovered. This still, however, leaves a rich area of study of that information that can be recovered through archaeological means.

As the town begins to emerge from its historically obscured beginnings, historical documentation and archaeological survey work well together to piece together town layout allowing analysis of bid rent values and social patterning. However, beyond where they were clustered, it is still virtually impossible to examine closely the lifestyles, living conditions and resistance strategies of non-elite workers, whether they are white, Asian or Aboriginal.

1882–1891: The Height of the Cossack Pearling Industry

A census taken in 1891 provides a snapshot of Cossack just after it was joined to Roebourne by the tramway and before the slump in the Cossack based pearling industry. By 1882, the area of colonization had pushed out to the Ashburton River region, the De Grey River Region, and the pearling industry was exploiting the newly discovered oyster beds of the Broome coast and King Sound. The ports of Onslow, Port Hedland and Broome were created to serve these new areas in the mid-1880s. The frontier also pushed inland to the Hammersley Ranges, and in 1887 the Pilbara goldfields were discovered, adding a new element both to the settlement pattern and to Cossack as a port now servicing goldfields. By 1887, both Cossack and Roebourne were successful enough as towns to be proclaimed municipalities (De La Rue 1979:45).

In March 1887, a new arrival described Cossack at that time as consisting of a stone post office and customs house, the northwest company store (McRae's), a wooden church and two wooden hotels. There was no bank, and only a causeway linked the port with Roebourne (Owen 1933). Historical research (Hutchison 1991) does not indicate the presence of a church in Cossack. The wooden building Owen referred to is probably the first school and public hall on lot 110 which, as the only public hall, would have been the mostly likely building to have functioned as a church on Sundays.

Owen completed the Cossack to Roebourne tramway that freighted goods at 12s 6d a ton, an improvement on dray freight that cost 25s a ton. He also advocated and built underground water tanks for the government buildings and built the Jarman Island lighthouse and lightkeeper's quarters (Owen 1933).

In the same year, C. Flinders who arrived on the maiden voyage of the *Otway*, the first electrically lighted vessel on the northwest coast, also described Cossack. The steamship anchored opposite the two hotels and Flinders described the town as:

> "One long straggling row of houses consisting of the two hotels, Dalton's wine & beer saloon, the mercantile store managed by Pearse, the Union bank, Mrs. Pead's boarding house, the school and a few private residences" (Flinders 1906).

There is a discrepancy between Owen and Flinders as to whether or not Cossack had a bank in 1887. The Union bank owned part of lot 121 from 1883 to 1887 and had moved to a stone building on lot 130 by 1891. The building on lot 121 may not have been a full branch office, but just an agency. This would explain the discrepancy.

Pearling entered a new stage during this period where hard hat diving using European or Malay divers and a mother ship system quickly became the industry norm after 1883. These changes required a greater outlay of capitol than the systems used previously and led to a general takeover of the industry by British-based interests who installed local mangers to handle the day-to-day running of the operations. Some of these managers were local pearlers, and others were new to the northwest. Many of these new people were based in Broome by the end of this period. The labour requirements of the industry were also affected as skin diving was gradually phased out. By 1891, the fleet consisted of only 899 people of which only 85 males and 14 females were Aboriginal. It is clear that the overall labour requirements of pearling had dropped and that, in particular, the need for Aboriginal workers had dropped significantly.

At the beginning of these changes, the 1885 post-office directories (Wise 1885) list 93 people in Cossack, 43 of which were pearlers and 14 were associated with ships and shipping. Of the others, there were four government officials, three people associated with the hotels, 12 with the stores, an accountant, who may have run the Union Bank agency on Lot 121, 6 tradesmen and three teamsters. The trades present were those of blacksmith, carpenter and butcher.

The number of pearlers steadied at 43–44 during most of the 1880s with over half of them being there for all that period. The number of men associated with the port function of servicing or crewing boats and shipping goods actually dropped from 17 to 14 in the early 1880s, partly due to the rise and fall of several shipping agents who failed to compete with McRae & Co. This side of the town's commercial population is the most fluid with only one master mariner, one shipwright, McRae & Co. and the government tidewaiter lasting all through this period.

By 1889, the number of people listed in the post-office directory had dropped to 53 (Wise 1889) with only 11 pearlers and 13 men associated with ships and shipping left in the port (Table 6.4). Despite this, there are a lot more people associated with trades or stores. Women for the first time are visible in the records with an accoucheur, milliner, laundress, dressmaker, boarding housekeeper and hotelkeeper. This is partly due to women catering to other women as the extreme male

Table 6.4 1889 occupations in Cossack

Occupation	Number of persons
Police	3
Teachers	2
Associated with boarding houses	9
Associated with banking	3
Estate agents	1
Associated with textiles	7
Associated with butchers	5
Soft drink manufacturer	1
General dealers	17
Merchant	1
Teamsters	3
Associated with the port	45
Telegraph	3
Ship builder	1
House builder	6
Market gardeners	4
Jeweller/goldsmith	1
General labourers	11
Pastoralist	5
Pearlers	14
Forestry	4
Water supply	1
Miners	4

to female ratio of the initial colonization phase settled into a more normal ratio between the sexes. It is also partly due to women taking up trades after their husbands have died. By 1889 Chapman, Pead, Hall, Ellery and Farquahar McRae were all dead and a year later Alex McRae also died.

By the 1891 census there were 186 males and 86 females living in Cossack giving a total non-Aboriginal population of 272 residents. Their 1889 occupations are listed in Table 6.4 and show the town was at level three in the hierarchy established for the southwest. Town facilities were more sophisticated with a town waste dump and a delivered water supply. The water carrier barrelled the water at the well then hitched the barrels behind a horse to deliver the water needs of each household to their door (Thompson n.d.). There is no evidence in the stated occupations for the deposal of night soil. In the 1920s the toilets were pan toilets and a night soil man emptied them and carted the waste to the town dump (H.M. Wilson, personal communication) but when this practice started is unknown. Prior to this service backyard toilets would have either been bush toilets located over a hole or bucket toilets which were emptied into a hole dug separately from the toilet but still within the lot confines.

Few Asians can be linked firmly to Cossack before 1888. However, three of the eight so identified were partners in stores. In 1883, Yee Ah Chan, a partner in See Sing Co. was living in Cossack. In 1884, he was joined by Ah Ling who was a

partner in Wah Sing & Co. and in 1885 by Ah Sing who was both a shop owner and the owner of a coastal trader (Atkinson 1988). None of their stores are listed in the post-office directories of the time, indicating they were not a recognized part of the town. This suggests they were in the Asian enclave located beyond Pead's boarding House (Lot 146–147). It also suggests that by the mid-1880s this enclave had at least three stores and a coasting vessel supplying goods to the occupants of the quarter. By 1887, at least five Chinese stores were operating in Cossack and Roebourne and attracting the first adverse complaints about the competition (The Inquirer 28th Dec 1887 cited De La Rue 1979:109).

The archaeological survey information helps to define where Chinatown was. It appears to have lain mainly to the west of Lot 150 occupying the end of the back beach dune in that location and the dune between the lots and the cemetery. The enclave also spread between the two dunes and in front of them near Rocky Point.

The 1891 census lists 272 people in Cossack, 47 of which were Chinese men. The nationality of other residents was not recorded for this census therefore it cannot give a clear idea of the number of Asian and Aboriginal people in Cossack. The post-office directories also do not list any Asian business people in this period, even though they certainly existed.

The immigration information (Atkinson 1988) identifies 60 Asian men working in Cossack between 1888 and 1891. Only four Malays and two Japanese are identified, the rest are Chinese. The most common occupation is servant, although of the 31 identified 18 are noted only as coolies or general servants and they could well be part of the pearling fleet. There was also a ship's cook. Apart from servant or deck hand, the next most common occupation is that of merchant. There were five Chinese and one Japanese merchant who employed four others. Two of the Chinese merchants and one of the Malay men were pearling masters, another owned a coastal trader. The remaining occupations were cooks (2), carpenters (2) and a Japanese laundryman.

The census information identifies the presence of four market gardeners in Cossack. The information in Atkinson does not pick out gardeners at this stage, but some Chinese and Malay men have unknown occupations. Archaeological survey identified a market garden area to the north of Chinatown (McIlroy 1988) which was defined by drystone walls and contained two rock water tanks. The site was associated only with Asian material culture and therefore appears to have been built and used by Asian people. A second market garden area on the tidal flat at the rear of the town was identified by Yates (2002), and at least one fringe camp associated with this was tentatively identified during surveys in 2003 (Paterson 2003) although closer analysis of the site came to the conclusion that the site could not be definitively linked to specific ethnicities (Carson 2003:70). Archaeological dating of these sites is not yet available, but Blue Book information indicates that it is possible all or both market garden areas were first used during this period.

The overall layout of the major groups within the extent of the 1881 town (Fig. 6.6) did not substantially alter between 1881 and 1891 except for a Fremantle merchant named Bateman, taking over lots 127 and 128 next to the government complex. A stockyard existed on this land in the late 1890s, but it is not known if

it was built by Bateman at this time or earlier by Clarkson. Land ownership within the town expanded further with all the lots between Nanny Goat Hill and the cemetery being taken up. Bateman also brought one of the lots Chinatown was built on with Horrie Sholl, a pastoralist and expert pearl cleaner buying the other one. The lot later passed back to the wife of the pearler who originally owned it.

Cossack was also connected to Roebourne by a horse drawn tram. The tramline came into the town from behind Long Hill and run down the centre of Pearl Street to a wooden tram station built on the government owned lot 125. Beyond Frazer Street a mix of pastoralists, pearlers, merchants and tradesmen owned the land. There was also a mix of landowner occupations on the extension of the grid lot pattern down Pearl Street towards the tidal salt flats at the rear of the town. Martin the butcher brought lots behind Long Hill where he established his abattoir and Galbraith another Fremantle merchant built his stone store on Lot 154.

The holdings on lots 121–123 (the store and mangers house) of McRae & Co. were sold to Fremantle merchants after the death of the partners placing all three of the white owned stores in the town into Fremantle merchant hands. Neither Pead's widow nor his son appears to have taken over his business interests, and Mrs. Pead turned the house into a pearlers boarding house. One of Hall's sons appears to have kept the shipping agency part of Hall's store operating, but not the ship's chandlers. The Halls still controlled three of the four Hall lots west of Douglas Street and brought back the fourth. Either the son or the Hall family collectively appears to have maintained the leasing part of Hall's business. Mrs. Chapman initially took over the Weld Hotel when her husband died, but by 1893 the hotel was being run by Mrs. Stewart.

By 1891, the town has clearly grown from a nucleated two-row settlement to a frontier town grid pattern settlement (Lewis 1985:266) settled the most densely along the main transport route. Technology was low level and consisted of services such as carpentry, house building, shipbuilding, blacksmithing and soft drink manufacturing. All of which are fairly self contained and part of a spatially spread technology only in the sense that most of the supplies for these trades such as nails, fixtures and bottles were made elsewhere. They were in fact the end point of a spatially spread technology, not the start point, in stark contrast to the pattern found by Lewis on the American eastern seaboard frontier (Lewis 1975).

Pearling was the only Cossack-based industry that started the simpler stages of a complicated manufacturing sequence that was finished elsewhere. Shells were cleaned and trimmed, and the oyster meat and any pearls were removed before the product left the port. The only value adding process carried out in Cossack was the peeling of pearls and pearl blisters to remove blemishes and reveal pleasing shapes. Except for the export staples of wool, pearl shell and for a short while, gold ore, Lewis's (1975) hypothesis of small-scale technology being the start point of a spatially spread technological process is not borne out in the northwest, rather small-scale technology was an end point receiving manufactured supplies for producing and selling regional goods.

While a local pearling and trading elite can be seen emerging with at least two tiers of social status by the mid-1880s, by the end of this period all of the upper level of urban elite's had actually died. This caused a turnover in Cossack-based

elites. After these deaths, there is a clear loss of control of the towns trading function to Fremantle merchants, with these more forceful of Cossack's elites not being replaced by other north-westers but by elites based in the southwest. This parallels broader changes in the pastoral industry during the same period during which ownership also shifted into southwest hands and the movement of the pearling industry and coastal shipping into British hands.

Although both northwest pastoralists and pearlers established control over their workforce, it is clear that by the end of this period they had lost the power struggle with homeland elites at both the town and regional levels. As the regional elites lost power, there is emerging evidence of successful resistance in some sections of the workforce. In 1881, only one Asian had established himself as a pearling master, and by 1891 there were three. Six other Asians had established themselves as merchants, and a seventh was a coastal trader. Asians also owned and operated the only market gardens in the town. All were still confined to the Asian enclave, but by 1887 there were already complaints that they had captured a large part of the Asian worker market from the white merchants (The Inquirer 28th Dec 1887 cited De La Rue 1979:109).

The Chinatown enclave is archaeologically different to other parts of Cossack (McIlroy 1988; Yates 2002) and was clearly operating as a "town within a town" with its own shops selling to the people within the enclave and its own shipping and trading routes. This suggests the maintenance of a separate cultural identity that was different to the identity and ideology of the pearling masters and that made them the outsiders in the enclave. By buying and selling through shops within the enclave, control was also exerted over the type and cost of goods used that was outside of the pearling masters and regional white retail elite control. Given the significant number of Asian people in Cossack and the northwest that were potentially removed as a market from northwest retail elites, this represents a significant and successful resistance strategy that was making itself felt by 1887 (The Inquirer 28th Dec 1887 cited De La Rue 1979:109).

Cossack as a town and a port is still at a level three in the hierarchy established for the southwest. The North statistical division (Ashburton, Roebourne and De Gray) with its four towns contained 2,422 people, yet there was only one church and no newspaper and only one town capable of sustaining level four functions. Attenuation of the population levels needed to sustain functions is marked (Table 6.3) and clearly affected the provision of services to Cossack. At an urban population level of 272, it should have contained a much higher level of services to parallel a southwest town.

The pattern of zoning and enclaves established by the end of the initial period had changed little by 1891 except that the central zone was dominated by the government and Fremantle merchants rather than the government and McRae and Co. The expansion of the town beyond the 1881 limits was not, however, in enclaves but was a mixed, mainly domestic, settlement of pastoralists, pearlers, merchants and tradesmen in a continuation of the third zone of domestic settlement identified in 1881.

Building Materials

Building foundations in stone continued in the early 1880s, and in the later part of the decade, stone buildings were erected starting with the stone post office in 1884 and continuing until all the government buildings including a lighthouse and keeper's quarter's on Jarman Island were built of stone (Owen 1933).

Alex McRae built Cossack's only stone domestic residence on Lot 104 sometime in the 1880s. While the archaeological evidence from test excavations on this structure are not of sufficient detail to date when the house was built (McIlroy 1990:62–64), there were no stone buildings in 1881 (1881 census). The house was built at a time when only the government was building in stone and thus is a clear statement of his status. Two other non-government stone buildings were erected later in 1890 or 1891. These were the Union Bank building on Lot 130 and Galbraith's store on Lot 154.

This period still showed a degree of multifunctionality of people and buildings, but this feature is less than in the previous periods. There was also clearly more hierarchy within the town with the growth of an upper echelon of elites in the mid-1880s associated with pearling and trading. These people expressed themselves and their view of an ideal world in where they built, mainly forming an enclave of common interest, one which overlooked the Asian part of their workforce and separated it from the rest of the town. They also expressed themselves in what they built; family homes rather than multifunctional buildings and to some extent in building material. The use of stone in solid foundations, retaining walls and even houses being almost the exclusive province of the pearling and trading elites and the government that supported them.

The obvious exception to the use of stone by elites is the Chinese market garden located just to the north of Chinatown. In this area, the Chinese were much more successful than the white colonists who had never successfully managed to grow kitchens gardens in the northwest. As the market garden is basically located at the back of a beach the stone walls would have had a vital but mundane function of protection from salt winds and sand drift. However, a wooden wall would also have served the same purpose. It is difficult to say if economics or social display prompted the choice of material. By the late 1880s, wood would have been needed to be brought into the town either by sea or land as the supply of mangroves along the Cossack beach was used up. Stone, however, was to hand from the adjacent Mt. Beach, but building a stone wall is more labour-intensive than building a wooden fence. In the absence of historical information on who built it and why, was it an Asian entrepreneur displaying status or a communal effort by a group of gardeners who saw an economic benefit in using plentiful stone and their own labour? It is difficult to say what prompted the choice of material.

Despite the growing use of stone Cossack was still a town built of wood. Figure 6.8 shows part of the pearling enclave, the government enclave and part of the business district after ca. 1898. Only the roof of Alex McRae's large stone house can be seen in the photograph but Farquhar McRae's home and another house

Fig. 6.8 Cossack ca. 1898. *Source*: 20997P: Courtesy State Library of Western Australia, The Battye Library

on the lots next to Alex's are shown to be small, square and Georgian with steeply pitched wooden roofs with one clearly having a front and back verandah.

A panorama was taken of the town centre from a boat moored off the town jetty which is dated to between 1887 and 1897 as the photograph shows the horse drawn tram in Pearl Street. Unfortunately, only a photocopy of this photograph now exists, so the image is not of a quantity that can be published. Nonetheless, the photograph shows the only view of the extended Knight and Shenton Store building before the 1898 cyclone. The extension is shown to be an open verandah on the side facing the inlet but an enclosed verandah along Pearl Street. Cropping and enlarging the slightly later dating Fig. 7.1 shows the Pearl street side of the building with an open verandah (Fig. 6.9), a circumstance archaeological evidence suggests happened after the 1898 cyclone damaged the structure. The photograph also shows the presence of retaining walls along Pearl Street, another site element added in response to cyclone damage in 1898.

The kitchen shown in both photographs is similar in style to the older homes shown in Figs. 6.5 and 6.8, but it appears to have a shingled roof. Despite extensions, the style of the extended Knight and Shenton store building is still Georgian, and indeed Fig. 6.8 shows that the predominant building style at Cossack was still Georgian but that by the late 1890s wide verandahs encircled many buildings.

1892–1911: Towards the End

During the 1890s, Cossack grew to its greatest extent, stretching from Nanny Goat Hill in the west to the cemetery in the east. Most of the stone buildings, which still

Fig. 6.9 Detail of Fig. 6.8. *Source*: 20997P: Courtesy State Library of Western Australia, The Battye Library

stand, are from this period, and most were government buildings. The wooden jetty was also replaced with a stone land backed wharf, and two separate specialist jetties were built to service the explosives magazine and the stockyards. The stockyard jetty was built adjacent to "Deep Hole" only part of the inlet deep enough to prevent boats beaching at low tide.

This flurry of mostly government building activity suggests a rapidly growing town, but by the turn of the century the town was in decline. Population peaked in 1894 when there were 141 Europeans and 255 Asians (WA Year Book 1894), but by 1901 there were only 165 permanent residents, 68 of which were Asian. Cossack was again devastated by a severe cyclone in 1898. The damage to the new wharf, combined with the gradual silting up of the inlet, the increasing size of the vessels it had to service and competition for trade by other, newer, ports was enough to finish Cossack as a viable port.

Doubts were cast on the port's ability to keep servicing the steamship service, and a sea jetty was built at Point Samson in 1903–1904. A tramway connected Point Samson and Roebourne in 1910 and Cossack was bypassed, and in the same year its municipality was dissolved (De La Rue 1979:130). However so was that of Roebourne suggesting a decline of importance of the Harding area to the northwest as a whole, Cossack enjoyed a brief resurgence during the early 1920s when the Point Samson jetty was damaged, but the town was never again a major port.

There are no pearlers listed in the post-office directories for Cossack, neither in 1900 (Table 6.5) nor indeed in 1893 and 1895. The core of people shown in the directories in 1893 and 1895, except for the addition of a commissioning agent and a Chinese tailor in 1895, are the same. Few of the names are familiar from earlier years, and the town's population seems to have undergone another change. Bateman, Galbriath, Moore (in McRae's building) and Watson & Tee run stores.

Table 6.5 Cossack occupations in 1900

Government officials	7
Associated with shipping	7
Associated with port	7
Associated with hotels	2
Banking	1
Butcher	1
Teacher	1
Boarding house	1
Ship building	1
Contractor	1
Pastoralist	1
Teamster	1
Tramway	1
Retail	9
Unidentified	8

The Chinese stores of Hop Sing & Co., See Sing & Co. and Wah Sing & Co. are finally listed as well as a Chinese baker operating out of See Sing's store. The hotels continue the same function but are run by different people, and the town has three boarding houses and a bulk beer shop. There is also a shipwright and a butcher.

In the early 1890s, some of the Asian businessmen began successfully moving out of the Asian enclave into the main town area. The first of these appears to be John Chi who owned the southern end of Lot 170 between 1890 and 1895 (Hutchison 1991). John Chi was a pearler who owned two boats and employed 13 others in 1887. He was one of only five Asian pearling masters listed in 1889 (Atkinson 1988). He later moved to Broome where he owned property and ran a boarding house in the lane named after him. Lot 117 was sold to Lee Sing & Co., storekeepers in 1893 however; this name never appears in the post-office directories. Thompson identifies a shop next to the White Horse Hotel as an Asian tailor whom the 1895 post office directories name as Wong Hong. The site of this shop is on either Lot 118 or 117, but its exact location could not be verified archaeologically. However, the historical information would suggest it was on the Chinese owned Lot 117.

Thompson also identifies See Sing's store, bakery and residence as being located to the west of Douglas Street. This site was found during archaeological survey and was revealed as being partly built of stone (Nayton 1991:24–25). Three drystone walls, which are 2 m in length, remain. They may have been an attachment on the back of a wooden building. Thompson shows a second Chinese store further along the same frontage and this would be either Hop Sing & Co. or Wah Sing's store. There is no compelling archaeological evidence found to date to pin point the location of this building.

A perusal of Atkinson (1988) shows 18 Chinese, 10 Japanese and two Malays listed as working in Cossack in the 1890s. One Malay man was a boatman and the other is a fisherman, and they appear to be the only Asians in these occupations. There is some overlap of occupations between the Chinese and Japanese communities. Of the stated occupations of the Chinese community, two are cooks, seven are

store owners with some being pearlers as well, four are labourers or shop assistants in the North West Mercantile Store, while one is a clerk for the Asian tailor and another is a gardener. Of the Japanese, three are storeowners or businessmen, one is a gardener and one a laundryman. There are no Asian pearl divers listed and none appear to have been contracted to work in the pearling fleet for 2 or 3 years as was happening in the late 1880s. The last work under these contracts terminated around 1891. The four men working for the North West Mercantile Store are the only ones to be on this sort of contract in the 1890s.

Although there are more people listed in 1900, of the 1890s core only Hall, Moore, Mrs. Pead, See Sing & Co., Thompson and the Union Bank are left. Occupations within Cossack at the turn of the century are listed in Table 6.5. Census information reveals that by 1901 only 68 Asians (mostly Japanese) and 97 white people were living in the town making a total population of 165.

Again Atkinson's (1988) lists less Asians in Cossack than the census information identifying 11 Chinese, 25 Japanese and three Malays in Cossack between 1900 and 1920. Two of the Malays were cooks and one was a labourer. Of the Chinese two were cooks, three gardeners and four were shop owners employing four others. One of the shop owners ran the tailors' shop and was also the town photographer; the other shops appear to have been general stores. One of the stores was See Sing's, another was run by Fong Kee and Fong Joe who brought the Union Bank building on Lot 130 in 1904. The location of the other stores is not known and they were probably within Chinatown. Stores within Chinatown appear never to have been listed in the post-office directories.

The Japanese occupations were more varied with six laundryman, two fishermen, two gardeners, four carpenters, one housekeeper, two cooks, one goldsmith, three pearl divers and one storekeeper and pearling master. These occupations were also quite common for Japanese people to pursue in Broome but almost half (41%) of the Broome Japanese population were associated with the fleet. In the 1890s Japanese divers established themselves as the mainstay of the hard hat pearling industry and remained in that position until Japan entered the Second World War at which point Japanese people living in Australia were interned.

While the Chinese storekeepers had begun to spread out of the Asian enclave in Cossack, Muramats a Japanese merchant and pearling master took over large portions of the town. He brought the original grant to Lot 151 in 1904 and this is where he built his house. Then in 1907 the North West Mercantile Store complex on lots 122 and 123 was sold to him and under his ownership the old Knight and Shenton building on Lot 123 become a Japanese laundry run by T. Masumoto until the late 1920s (Wise 1920). The building then housed his divers. He then brought Lot 152 adjacent to his house in 1910 and the adjacent Lot 153 in 1911 giving him a solid block of land at the edge of town near the remains of Chinatown. He also brought Lot 154 on Pearl Street on which Galbraith's store building still stood. For a short while between 1911 and 1914 he owned the land the Weld Hotel stood on and during the same period he started buying up the Hall lots west of Douglas Street until by 1923 he owned lots 141–145 giving him another solid block of land. He completed his third block of land by buying Lot 121 next to his store properties in the centre of town in 1932.

Chris Thompson visited the town in 1930 and stated the town consisted of the hotel containing the licensee, his wife and a cook. Harry Edney and his wife were living near Nanny Goat Hill with his brother Jim and his family near the schoolhouse. Ernest Hall was living in the Hall house with Jim Ramsey near Lookout Hill and Laurie Bruce in the post office. A Greek family lived in the courthouse and Japanese lived in Martin's house, the North West Mercantile Store manager's residence (Knight and Shenton building) and the Customs House and Bond Store. They also occupied the only house left in Chinatown and run the North West Mercantile Store (Thompson n.d.). These Japanese people were all living on land owned by Muramats. They were interned at the start of World War II, a move that finished Cossack as a viable hamlet, and the rest of the town was abandoned some time after the war.

Broome

1880s–1900: The Early Years

This gradual spreading out by Chinese followed by domination by Japanese in Cossack is very different to what happened in Broome. The Broome town site was somewhat spread out, being almost 3,000 m in length, which is almost three times as long as Cossack. Central place functions were separated into clusters at both ends of the spread giving a development pattern similar in nature to the development of Bunbury in the southwest where geographical conditions allowed the port and the inland administrative centre to grow on locations so close together that the two clusters linked to form one town.

In the early 1880s, before the town was surveyed, pearlers used Mangrove Point as a camp and distress stop, and this was where the main town jetty was built in 1896. The early cemetery, which has graves dating back to the use of the place as a distress stop, is also in this area and the first town nucleus developed there. It later held the homes of the pearling masters and the white administrative functions of the town. A second nucleus developed around a channel and landing place cut through the mangroves into the more protected Dampier Creek. This area became Broome's Chinatown with Napier Terrace running inland from the landing place and Dampier Terrace running along the foreshore. The two town nuclei are connected by Hamersley and Carnarvon Streets, which meet approximately halfway to the Dampier Creek landing place (Fig. 6.10).

The pearlers who settled in Broome were for the large part not the same pearlers who had earlier worked the beds around Cossack. In the 1880s and early 1890s, they employed Aboriginal and Malay men as divers, crewmen, shell packers, cooks and labourers (Atkinson 1988). By 1891, Broome had an urban population of 121, which serviced a large portion of the fleet population of 663, which used the port as their base (1901 census).

The importance of Aboriginal workers to the pearlers declined after 1886 with the rise of hard hat diving and the emphasis shifted to Malay workers. Unlike the

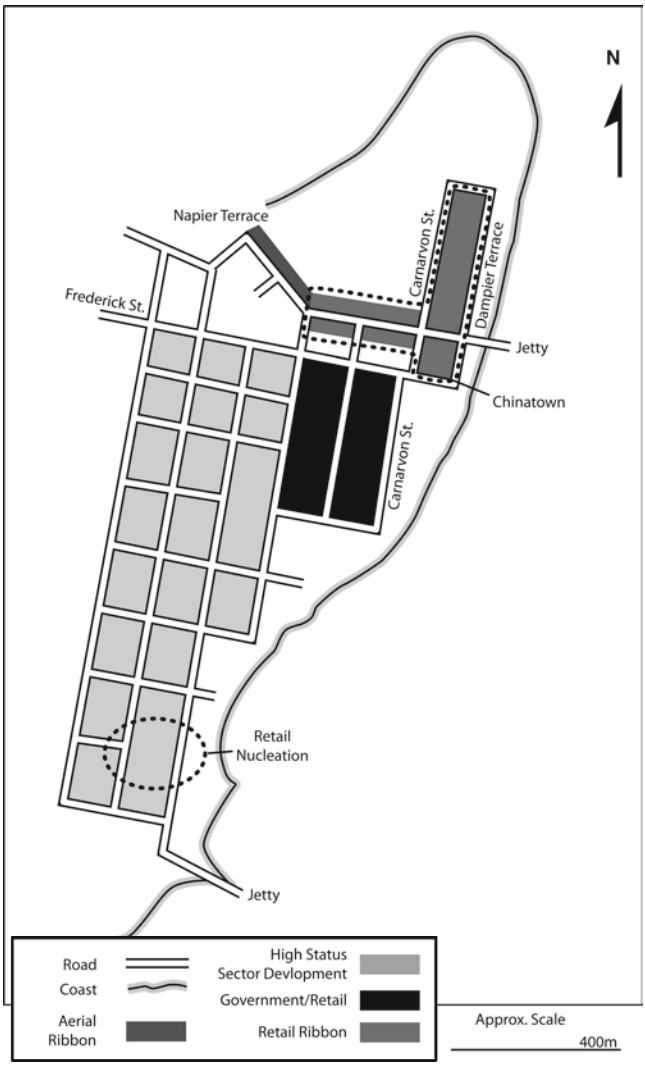

Fig. 6.10 Broome bid rent zones

Malays and Aborigines, few of Broome's Chinese worked for the pearling fleet, most of them being associated with shops. There were 13 businessmen, 3 shop assistants, 4 tailors and 6 cooks recorded by Atkinson (1988) in the 1890s. Only four Chinese people were employed outside of shops, and only one of those was with the fleet.

The Malay men working for the fleet were living in foreshore camps run by the pearlers and an area or areas known as the Malay Camp. The foreshore camps adjacent to Chinatown started at the southern end of Dampier Terrace and spread northwards along Dampier Terrace and beyond it to the area now known as Morgan's Camp.

They dominated the creek side of Dampier Terrace. There is one 1894 reference in Atkinson (1988) to the Malay Camp being near MacPherson Road. Geographically, this is located directly inland of the main landing place for the pearlers in Dampier Creek, which would make sense geographically. It was also a marshy area, which suggests the presence of the water so necessary for survival. In the town plans of 1890–1906, a temporary camping ground is marked near MacPherson Road in a triangle of land that was later used for the municipal stables. This camp is probably the remains of the main Malay camp.

Only one Chinese man worked with the fleet. The others mainly owned or worked in shops or were tailors or cooks. Where they worked is unknown as the first known tenure for a Chinese storekeeper is in 1897 (Aris et al. 2001). In Cossack, during the 1880s, Chinese men founded their own shops and a few became pearling masters. In Broome, this trend continued with the competition in the pearling industry producing an appeal from pearlers to the government for their exclusion (V & P 1886 cited in Moore 1993:16), resulting in an Act being passed for a licencing system. Chinese pearlers who could not get a licence had their plant brought by the government. The licence system was intended to exclude Asians, as is evidenced by the agitation caused by the granting of a licence to an Asian in 1890. After which the Governor Resident in Roebourne was ordered not to grant an Asian a licence without permission from the Attorney General (CSR 2088/88 18/5/1887 Battye Library cited in Moore 1993:17).

Although the area adjacent to Dampier Terrace is known as Chinatown and the Japanese and Chinese people of Broome were certainly later confined to it, there was a solid white presence in the area too. White traders or pearlers brought 14 of the 17 original lots with the government keeping control of the three lots adjacent to the landing place. The development of the lots varied according to the proximity of the lot to the landing place and its susceptibility to flooding (Aris et al. 2001). The Dampier and Napier Terrace frontages of the lots formed a retail development with the government building a customs house on Lot 10 opposite the landing place. The rear sections of the lots were subject to flooding, and at this point Carnarvon Street had yet to be extended northwards past them.

The London-based pearlers Streeters were late comers to the town and all the original lots had been sold by the time they were looking to buy in 1888. Streeters requested the line of Chinatown lots be extended north then brought most of the new lots for their complex (Aris et al. 2001). Their store dominates Short Street frontage of their lots, and they built their own jetty at the end of Short Street. The associated Male slipway and shipyard for lugger repairs was situated even further north being located on the foreshore just north of the end of Dampier Terrace.

1900–1930: The Golden Years of the Broome Pearling Industry

Of the 3,000 m of town site, the white population came to dominate 2,000 m and shared other areas leaving the Chinese and Japanese populations to dominate an area of only about 400 by 200 m. A mixture of all races appears to have occurred

in a secondary retail ribbon along the western end of Napier Terrace, which spread over the adjacent areas of Weld, Robinson and Frederick streets (address information provided by Atkinson 1988).

Over a thousand people are recorded as living in Broome in 1901 (1901 census). The town also serviced a population of pearlers and pearling camps located in creek valleys up and down the coast. The number of Malays recorded by Atkinson (1988) drops in the 1900s, partly because several different peoples were no longer being lumped together under that name. Of the 16 Malaysian people left, almost all were with the fleet living either in the foreshore camps or within Chinatown.

By the 1900s, the Filipino population is no longer recorded as a subset of the Malay population. They were almost exclusively associated with the fleet with some ex divers who had taken up fishing. They were mainly housed at the foreshore camps and within a small block bounded by Robertson, Weld, Frederick and Stewart streets (address information provided by Atkinson 1988). Most of the fishermen appear to have been living at Fishermen's Bend on the other side of Dampier Creek. A few Filipino men were located in Carnarvon Street and in lodgings to the rear of the Streeter and Male store. Three Filipino men were businessmen running two billiard saloons and a boarding house; one other Filipino man had the occupation of engineer.

Archaeological survey and aerial photographic analysis (Nayton in Aris et al. 2001) suggests the internal layout of the foreshore camps was virtually random. They were not built to a grid or row pattern, arranged around a central feature or obviously aligned in any way to an outside feature such as the river bank or a road (Fig. 6.11). The structures were small; approximately 2.5 m square and often attached to a row of others. This row appears somewhat haphazard with a distinct curve sometimes developing. There is no visible evidence of substantial building materials such as large posts or stone foundations associated with these sites although some are associated with low earth mounds, which appear to have been used for foundations in low-lying areas. The structures may have been lightly built of wood and iron, if so the iron appears to have been salvaged for use elsewhere. At this point, it cannot be determined if the living arrangements in the camps were the result of conditions imposed by the pearling masters or whether they partly expressed the cultural identify of the workers housed in them.

Chinese and Japanese people appear to have been almost totally contained within Chinatown (address information provided by Atkinson 1988) except for a spur of occupation which spread along Napier Terrace to the Japanese Hospital near MacPherson Road and some mixed occupation in Hamersley, Weld and Frederick streets, on and north of Frederick Street.

When the occupations recorded by Atkinson (1988) are analyzed, the fleet employed about 41% of the Japanese population, mostly as hard hat divers. For the people not employed in the fleet, being laundrymen, dress makers/tailors, carpenters, cooks, servants, gardeners and labourers were the main occupations. A smaller percentage (37 people) ran stores or factories, while almost the same number ran boarding houses. A significant number of Japanese people were women, unlike other sections of the Asian population that were all male. Most of the women had

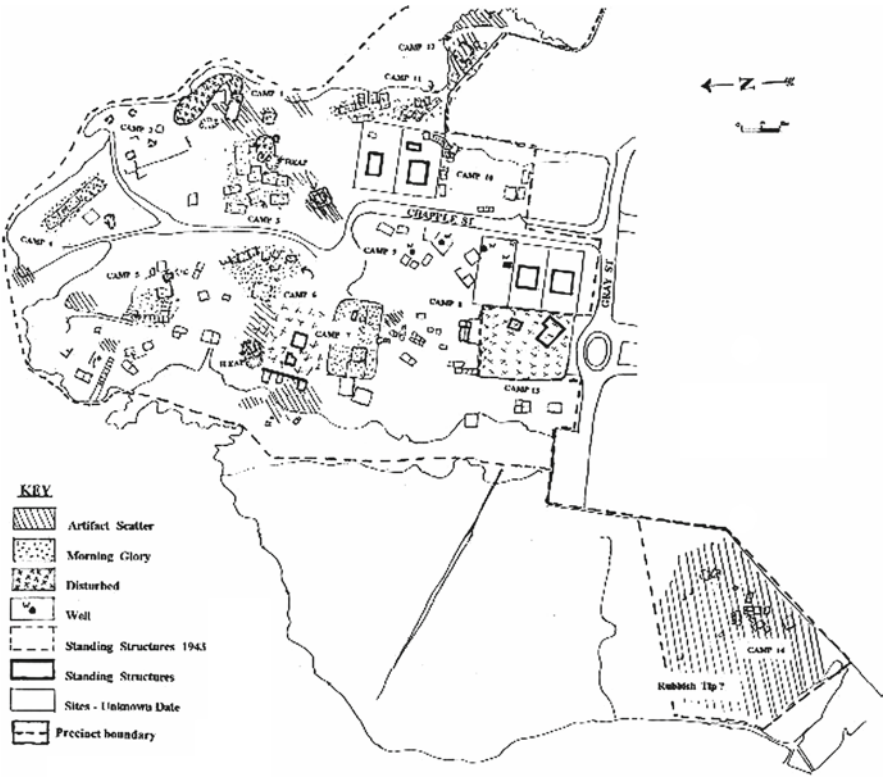

Fig. 6.11 Morgan's Camp area of Broome. *Source*: Aris et al. (2001)

the stated occupation of dressmaker or tailoress. A large proportion of these women lived in Shiba lane and had an unrecorded occupation as prostitutes.

The main occupations of the Chinese population were as cooks tailors and gardeners. Twenty-three Chinese people were business people running shops, restaurants and tailor shops with five others running boarding houses.

The Chinatown most visible in the historical information is the early twentieth century town. By then a discernable pattern had developed of white owned businesses on the Dampier Terrace frontage with mainly Chinese and Japanese businesses on leased land behind them (Aris et al. 2001). "The Asian buildings tended to be small, crowded and jumbled together off right of ways running between Dampier and Carnarvon streets giving the area a 'shanty town' character which is in contrast to the remainder of the Broome townsite" (Aris 1996; cited in Aris et al. 2001). The Carnarvon Street frontage of the lots was low lying and subject to flooding by spring tides. This frontage tended to have more Asian businesses along the lot frontage. Buildings on the western side of Carnarvon Street (except for Sun Pictures built in 1906) were all Asian.

However, archaeological survey and aerial photographic information (Nayton in Aris et al. 2001) suggest that the main Chinatown area had distinct patterns of

building layouts which appear to be linked to the three main races of European, Chinese and Japanese. Around the outside of the blocks on the Dampier and Napier terrace frontages and along the parts of Carnarvon Street running across higher ground are larger rectangular or square shops and offices associated with the white pearling masters and traders.

Behind these buildings in the middle and back part of the lots a distinctive building type predominates particularly on the original lots and the land opposite them on the western side of Carnarvon Street. The buildings are narrow; approximately 6 m across, with often two side by side on the same lot. They are aligned to either a street or a laneway with several back additions that contained a variety of businesses such as shops, restaurants and boarding houses extending back in a straight line. This form of architecture in the main commercial area was linked quite closely to Chinese tenants. However, the location of the structures is quite clearly governed by lot divisions and the subleasing arrangements within lots rather than Chinese cultural practices.

Both building practices are found in the town block containing Shiba Lane, but the building layouts associated with the Japanese dominated Shiba Lane and the Japanese Club are different (Fig. 6.12). There are two main building layouts associated with Shiba Lane. Both types of buildings are rectangular and larger than the long narrow layout, with one type being approximately 7 m wide and 9–16 m in

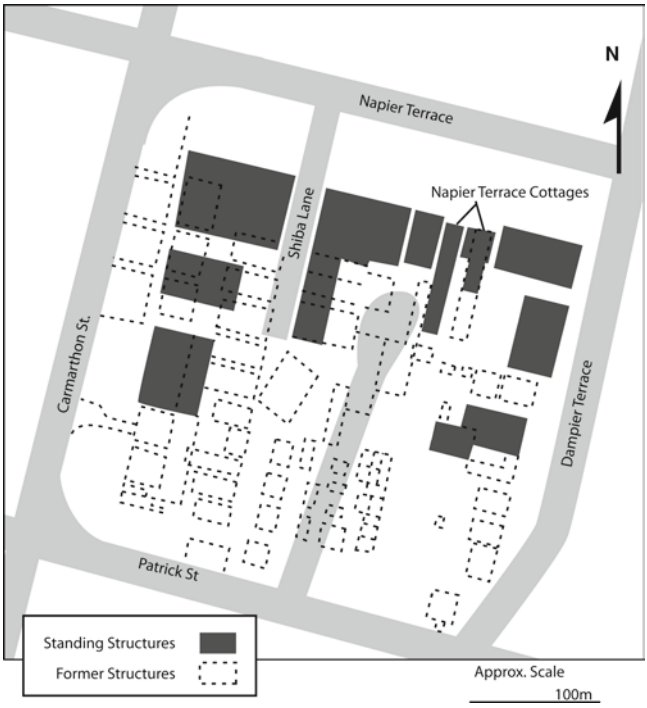

Fig. 6.12 The Shiba Lane Area of Broome. *Source*: Aris et al. (2001)

length with a large almost square outbuilding behind. The other type of building is larger and not associated with outbuildings. The form of these buildings may be related to function; Shiba Lane was a centre for brothels and is known to have also contained Japanese boarding houses. However, there were five Chinese run boarding houses in the main commercial area of Chinatown where the long narrow building type dominated. This suggests the differences might have been cultural rather than functional; however, archaeological excavations within Chinatown are needed to determine if this is so.

It appears that the Asian people of Broome may have asserted their cultural identity in what they built, in celebrating customs and festivals to which they controlled the invitations and in their material culture, which like Cossack is clearly distinct from non-Asian sites. However, the strong non-Asian element within the enclave would have prevented the area from acting as a "town within a town" as effectively as the Cossack enclave may have done.

While the Asian people of Broome were unable to exclude the white population from the Chinatown enclave they were effectively excluded from the "white" town area. Most of the pearling masters, while having business interests in Chinatown, did not live there. The areas where the white population lived were distinctly separate from Chinatown with Frederick Street serving as the boundary between white and non-white homes causing a visual segmentation of the town.

The pearlers established themselves mainly along Robinson Street behind the port area associated with the first town nucleus and in the area south of Fredrick Street and west of the government and services secondary ribbon development along Weld Street (Fig. 6.10). They were able to establish a visually opulent lifestyle with large houses, servants, gardens complete with gardeners and white suits; the ultimate luxury in a town of black sand and scarce water supplies. They were a very visible elite population, who by ca. 1910 had established so much control over the industry they no longer had to put to sea themselves. Under the tender system, Japanese divers run the pearling boats, and an intense competitiveness had been established between them. The diver who brought in the most shell in a season was feted and money and status were firmly linked to the fiercely fought for honour.

As the profits of pearling concentrated into fewer and fewer hands the ratio of pearling master to pearling worker worsened. The Broome pearling masters were, in effect, plunged back into a frontier situation where they were a small band surrounded by a potentially hostile culture. In 1901, there were 55 whites and 943 non-whites working in the pearling fleet much of which was based at Broome (Census 1901) giving a ratio of 1:17.

The northwest pearling industry fought hard to be exempted from the *White Australia Policy* (Commonwealth of Australia 1901; De La Rue 1979) the provisions of which would have prevented them importing coloured labour. But they did not apply the same pressure to exempt their workers from the personal restrictions of the act which prevented them from bringing their families into the country, owning businesses such as pearling luggers and staying past their employment contracts. Malcontents could also be deported all of which institutionalized the

minority pearling elite's rigid control over the work force. With the legal weight and enforcement of the *White Australian Policy* the Broome elite's did not need to physically overlook to dominant Chinatown as in Cossack. There were exceptions to this such as the Male house, which dominated the Streeter enclave behind the store buildings. Other pearlers, however, appear to have used a mixture of legal enforcement of unfair laws such as the colour bar on "white" areas of town, *White Australian Policy* restrictions, the physical segregation of races at entertainment's, and psychology, such as the mixing of races thought to be incompatible on pearling vessels to prevent mutiny' and establishing fierce competitiveness by linking money and status to the size of the pearling catch to achieve domination. This was then re-enforced psychologically by their very visual and opulent lifestyle.

Resistance and Domination

Chapter 5 ended with the question. Did the northwest development elite of the 1870s and early 1880s manage to accumulate surplus in the frontier in the form of infrastructure and wealth accumulation during their brief period of resistance?

The differences between the snapshots of the northwest in 1870 and 1881 indicate that the pastoral industry did not achieve significant accumulation of surplus in the form of population and structures within a landscape dominated by large homestead complexes until after the rise of the pearling industry. However, pearling itself did not give rise to an urban elite environment within the two northwest towns of Cossack and Roebourne, which had a built environment of small wooden buildings with relatively high density ratios of the elite population. However, analysis clarifies that by the early 1880s there was an emerging northwest adaptation of an intermingled web of pastoral and pearling elite's with underclass layers of whites and non-European workers within a settlement system split between the frontier towns and a pastoral hinterland.

To some extent, this adaptation was translated to the built environment of the pastoral stations with large comfortable homesteads built largely between 1871 and 1881 separated from the worker and work areas of the homestead complexes. It also translated in the accumulation of surplus in the towns, particularly in areas associated with facilitating exports and to some extent in the building of an elite enclave of single purpose homes.

Both Cossack and Roebourne can be shown to have developed central place functions similar to those in the southwest but with a pronounced attenuation of the population levels required to sustain functions. Cossack can also be shown to have developed as a nucleated two-row settlement then into a frontier town grid pattern settlement (Lewis 1985:266) settled the most densely along the main transport route and conforming in the placement of functions largely to bid rent economics. In this, it follows patterns identifiable from southwest towns but with the T-shaped port pattern truncated by its location at the side rather than the head of the inlet. This produced a pattern with a short leg for the T shape and an extended arm for

one side of the T as it functioned as both the port service ribbon and the main route inland. Only the original tramway route followed the classic T-shaped *Anyport* pattern (Bird 1971).

The Cossack pearlers developed strategies for handling master–worker relations, which were largely successful. Ethnic groups were segregated into separate living areas with very basic accommodation and harsh working conditions leading to a high death rate. However, problems with successfully dominating some sections of the primary producer population probably guided the location of the pearling master enclave in Cossack so that it could physically overlook the "problem" Asian population leaving the enclave in an unexpected position that does not conform to bid rent economics. Despite this, the urban elites of Cossack were unable to stop Asian businessmen from competing with them as pearling masters, coastal shippers, storekeepers and tradesmen. In terms of Paynter's model, there was successful resistance from some sections of the primary producer population. This resistance intensified as Cossack lost importance in the trading network, and elites became concentrated elsewhere.

By 1891, this initial landscape of small elites had given way to a landscape where resources are concentrated into a few hands, and it is quite clear that the development elites of Cossack failed to establish themselves as elites to the same extent as the pearling masters of Broome.

The scope for archaeological analysis in Broome is extensive. In terms of the Western Australian settlement pattern it is somewhat unique having virtually no productive hinterland behind it. It is an extreme variation on Albany's story of a town that survived because it was an important port rather than because it serviced a pastoral hinterland. It also tells the story of a pearling industry that was radically different to that of Cossack but like Cossack much of that story is the untold one of the pearling workers.

There has not been enough archaeological research into Broome to determine conclusively if it followed the same development stages as towns in the southwest in its formative years. The formation of Broome as a distress stop, then pearling port with a hinterland consisting of one pastoral station, is different to what happened in the southwest as there was no clustering of services in the hinterland before moving into the town site. The town, therefore, started as a level two town when it was decided to make a permanent settlement out of the distress stop.

What is very clear is that the pearling masters of Broome established themselves as powerful regional elites that were able to successfully resist both the Western Australian colonial government and the new Australian government in policy areas which affected their profits. The pearling masters successfully dominated both their workforce and the service industry which catered to the needs of their workers. Both land ownership, the occupation of the best bid rent positions on the lots and the size of the structures suggest the domination of the white population over the Asian. So does the amount of land allocated to each, which saw the Asian population crowded into a small part of the town and visually and physically segregated, both in work, living arrangements and leisure activities.

But in terms of Paynter's (1982) model, they were dependency elites not development elites, and they therefore channelled surplus away from the frontier for their own and the homeland's benefit. This means that less surplus accumulated in Broome than might have, and its level of central place functions was quite low for a northwest town of its size and importance.

The establishment of services to the white population can, to a large extent, be traced through the Post-Office directories (Wise 1893, 1895, 1900, 1920). The directories do not provide a full picture, however, as services such as tailors, dressmakers, carpentry, laundries, gardeners and goldsmiths were provided by Asians and as such were not recorded. In 1893, Broome appeared to have the cable and telegraph, 2 hotels, 2 general stores, a butchers, a trading company and an auctioneer. The first Chinese store appears in the directory in 1895. By 1900, it appears to have had 2 Chinese stores, police, goal and courthouse complex, a Chinese baker, 4 Japanese boarding houses and an insurance agent. As a port, it had jetties, warehouses and a customs house.

On this basis, it appears to be a level three town in the town development pattern established for the southwest, but at this time it had an urban population of over 1,000 showing extreme attenuation of the provision of central place functions within the framework of Western Australian settlement patterns. Highlighting a situation where surplus was not accumulating within the region to any large extent keeping it at a frontier level of infrastructure and services. It was not until the 1920s that Broome moved to level four with the provision of services such as a newspaper, picture house, hospitals, schools, literate institute and churches.

This extreme attenuation of central place functions still plagues the Kimberley region today and is now echoed in the Pilbara. Since the 1980s, the Pilbara region has become the powerhouse of the Australian economy on the strength of mining wealth gained by mining its inland iron ore deposits and, more recently, its off shore natural gas deposits. In 2004/2005, its Gross Regional Product was estimated at 4.8 million with the region producing 95% of Australia's iron ore exports, all of Western Australia's liquefied natural gas exports and salt from the largest solar salt fields in Australia (Department of Local Government and Regional Development 2006).

Like the earlier short-lived gold mining industry the iron ore industry has led to clustering at inland centres near ore despots. Like the pearling industry, it has also led to the provision of transportation services such as specialist ports that ship tonnage far in excess of any other Western Australian port (DLGRD 2006) and dedicated freight railway lines. In 2005, industrial building applications valued at over $45.1 million were approved, but only 255 residential approvals for the regional population which was standing at 39,282 (2% of WA population). Because of the new industrial complexes, the regional population is expected to reach 50,200 by 2031 (DLGRD 2006). However, despite the wealth being currently pulled out of the land and sea, which accumulates in profits to multinational companies and royalties to the Federal and Western Australian governments, very little surplus remains in the region to support the workers producing the surplus.

The shire of Roebourne and its main town of Karratha is the focus of the regional settlement network of now well over 45,983 (Australian Bureau of Statistics 2009), with the shire containing over 18,000 people. Karratha, which has a population of over 7,000 people, has an airport but only a small district hospital, voluntary ambulance service and no paid paramedic. It boasts one small shopping centre, one high school and too few primary schools and pre-primary centres, which each have a waiting list of over 20 children unable to get schooling.

The provision of housing in the region is so far below that required that a basic three bedroom house in the Pilbara costs more than a riverside elite mansion in the capital Perth, and rents for such basic places have exceeded $2,000 a week. Much of the mining population live in donga accommodation (transportable accommodation which looks something like a storage container) crowded into mining camps and is flown in and out on fortnightly rotations. Not because the workers families do not want to live in the northwest but because there is nowhere for them to live. Attenuation of services is extreme, more extreme than Broome in ca. 1901/1920 because although the provision of services is at a similar three/four level the amount of population has more than quadrupled. However, the average weekly wage for the region is the highest in regional Western Australia (DLGRD 2006).

This extreme regional drainage pattern with excellent services only provided for the transportation of surplus out of the region and minimal surplus, in the form of infrastructure and housing, left in the region is the ongoing pattern left carved in the northwest landscape by market capitalism after the collapse of regional resistance. Despite market capitalism's focus on the worker as market with its attendant rise of consumerism and material accumulation by households, the patterns left in the Western Australian landscape echo the extreme drainage patterns of unopposed industrial capitalism. The only difference between the two appears to be the high portion of surplus left in the region in the form of wages; however, high rents and mortgages means that most households now spend 65% of their wage on housing costs leaving less for material culture accumulation.

While this is the pattern that eventuated, there was potential of a different one that now is consigned to history and archaeology. Can the affect of the early regional resistance and then the collapse of that resistance be traced in the archaeological records left by households in Cossack? This question will be perused in the following chapters that focus on the archaeological excavation of the Knight and Shenton store site, a site that variously functioned as a combined store and domestic house, store managers house, combined Japanese laundry and domestic house and accommodation for Japanese pearling divers.

Chapter 7
The Excavation of the Knight and Shenton Store Site

A building mound on Lot 123 at the general location of the first substantial building in Cossack, the Knight and Shenton Store, was excavated during a 4-month field season, conducted using a volunteer work force. The excavation site is located on a vegetated back beach dune close to the jetty used for the port landing. The building mound was located at the end point of the dune with the area being 2.46 m higher than the adjacent Pearl Street. The surface indication of the site was a large semi-vegetated sand mound with some visible evidence of buried walls and house posts. The sedimentary matrix was loose white sand in which no stratigraphy was visible. Visible stratigraphy resulted from the inclusion of charcoal or gravel as small, spatially discrete layers within the overall formless matrix.

The site of the store building and its back and sideyards was excavated by adapting the open area excavation method suggested by Barker (1986). An open area approach was necessitated by the loose nature of the matrix that caused the side-walls of test pits to collapse after only 15-cm depth. However, it was found that due to a lack of visible stratigraphy, the Barker method, which involves sequentially stripping back stratigraphic layers, was not totally appropriate for the site. It was found that a compromise between meter square excavation and the Barker method was the most suitable. This method resulted in the excavation being stepped with several adjoining squares excavated simultaneously but to different depths. As excavation proceeded across the site, all squares were eventually excavated to the depth of their cultural deposit. While the method provided information on features in the plan view, it limited the observation of vertical sections to two areas where greater sediment compaction allowed the use of trenches.

To relate the excavation to the work done during the preliminary field trip the same baseline, datum points, point of origin, and numbering conventions were used (see Chapter 6). Alpha Datum was used in taking all site levels. The Pearl Street baseline was originally set up to mark the boundaries of Lots 122 and 123. It was found in the field that site features in fact spilled over the lot boundary, therefore the grid was set up to extend 4 m to the east and 12 m to the west of the baseline.

The site was divided into 1-m squares and excavated in spits of approximately 5 cm depth. When a feature was encountered, the spit was terminated at that level and the feature recorded at a scale of 1:10. Spits were kept shallow to maximize the

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likelihood of achieving the short chronological divisions needed for research questions. Standardized site sheets were used to record all feature information and each square was excavated to a depth where artifacts and features were no longer encountered. This depth varied from 16 to 75 cm.

The excavated deposit was sieved using a 5-mm mesh and all recovered cultural material was collected and the sieve residue was also checked for cultural material before disposal. All artifacts from within a spit were bagged together. Artifacts can thus be located by square and spit but most cannot be separated with any greater definition. Artifacts found associated with a feature were bagged separately and recorded along with information about the feature.

PH was measured (using a standard soil pH testing kit) in a north–south transect across the site but showed no variation, recording at six and a half. As sediment analysis was not intended to form a large part of site analysis Munsell colors were not recorded in the field. Samples of sediment were removed for future testing if required.

The surface deposit in the backyard and sideyard contained large amounts of charcoal and architecturally related artifacts and clearly related to the burning of the building in 1979. Excavation of the backyard resulted in the recovery of approximately two thirds of this material. As this is a satisfactory sample size for most purposes, the remaining surface material in the sideyard was removed by brushing.

Surface Features

Loose sand across the surface of the site was excavated first to expose details of paths and foundations from the last period of site occupation for recording (Fig. 7.1). Excavation commenced at 26 m south of Beta Datum and continued to 42 m south. The area south of the excavation lay outside the boundary of Lot 123. Open excavation was confined to the area to the west of Pearl Street baseline. To the east of the baseline, the site dropped steeply 1 m in height to a 2-m wide terrace which was 1.60 m above road level, and was held in place by a basalt retaining wall which ran the length of both lots. The higher level was also stabilized along the length of the building pad by a basalt retaining wall. The features recorded from this part of the site were those already exposed on the surface. They were mostly associated with the height change along the lot boundary being rubble from the chimney of the detached kitchen, a basalt retaining wall which ran from 31s to 39s (the length of the house pad), and associated palm trees (see Fig. 7.1). The surface area immediately adjunct to the eastern wall of the building (31S0w–38S0w) was excavated to uncover the wall for recording.

The exposed backyard surface area contained three paths, two of which were clearly not contemporary, concrete in-filling, and some wooden uprights and horizontals from a corrugated iron shed which was still present on the site in 1979. Rubble was encountered at 30s and at 31s when the remains of a low wall of beachstone was uncovered. This wall ran from 31s0e to 31s8w and was revealed to be the northern wall of the building.

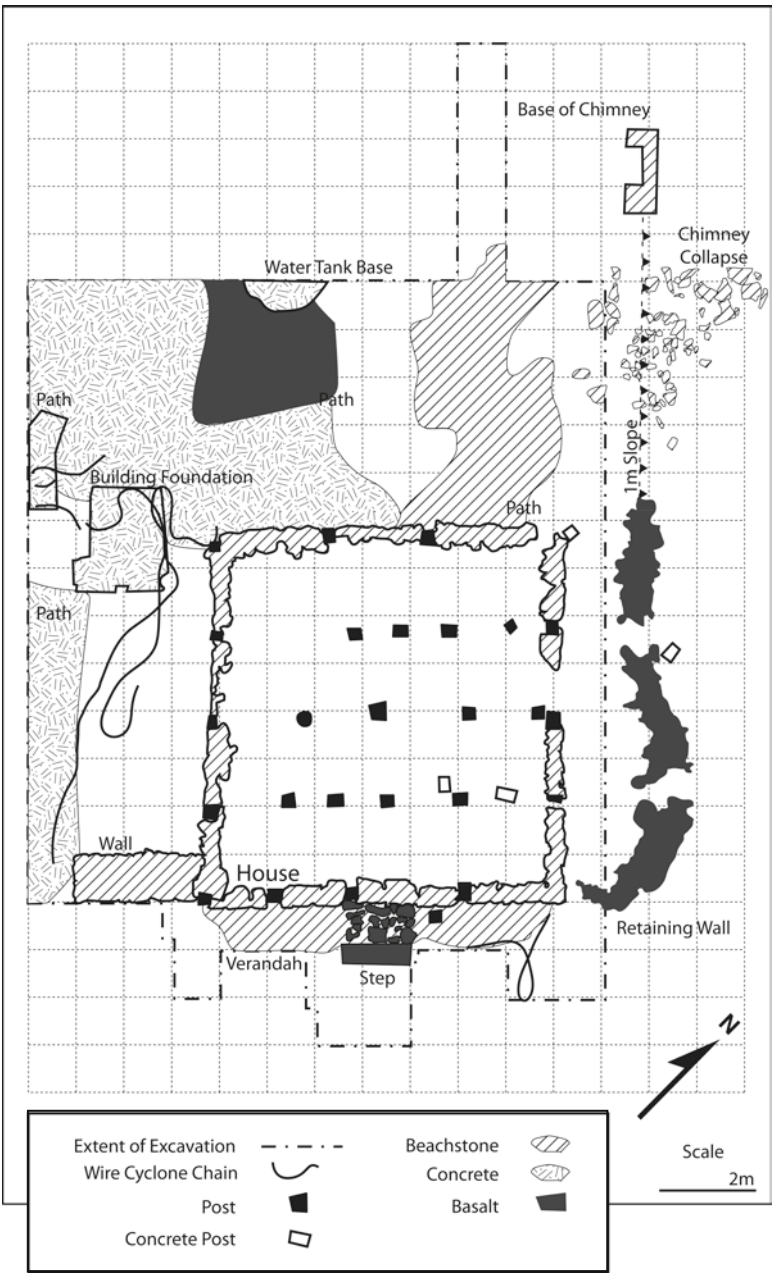

Fig. 7.1 Archaeological site plan of surface features – Knight and Shenton store site

Removal of the surface deposit in the sideyard revealed a square concrete feature, a concrete and beach-stone path, and beach-stone rubble. The area was defined on one side by the presence of the western wall of the building and at its southern extent by a buttressing wall of beach-stone.

Paving stones and the remains of a verandah or patio area were found adjacent to the southern wall of the house, however the area was not cleared and superficially visible features only were recorded.

Subsurface Features

Excavation within the backyard area necessitated the removal of flagstone paths and floors. The stones were numbered and removed to allow excavation to proceed. After excavation, the site was back filled and the surface features replaced using the surface feature site plan and individual meter square feature drawings as guides.

The backyard and sideyard areas were excavated using the open area technique explained above. Feature and artifacts records were later entered into the Map Info Geographical Information System program (GIS) system. Within the backyard, the shallow depth of deposit between 1w and 4w allowed the use of a trench instead of the open technique. A single trench averaging 10 cm deep was excavated (28s3w–28s1e).

Greater soil compaction allowed the use of trenches within the front yard and kitchen areas. In the front yard, a 2-m wide trench was enough to avoid wall instability. A trench 2-m wide and 4-m long was excavated from the house wall to the start of the garden paths. The trench was positioned so that it covered a large part of the front step area. Square 39s3w was also excavated forming in effect a second 3-m trench along the outside of the building wall.

The edge of the detached kitchen was uncovered during the open area excavation of the backyard at 26s. Due to the presence of humus within the matrix providing more cohesion, it was possible to take a section drawing of this feature (Fig. 7.2). A trench exposed the edge of the chimney foundations for recording in the same section drawing. A second trench was positioned to cross the structure in front of the fire place. A measured drawing was taken of the east section.

In 1979, the store building was the only surviving timber building within the abandoned town site but it was damaged during a cyclone in that year and afterwards burnt as a dangerous eyesore by a well meaning local preservation group. Peter Board, a Cossack bottle collector, at the request of the group acted as an amateur archaeologist and excavated the area inside the beach-stone walls of the building. This work has not been published in any form. However, personal communication from Peter Board states that the methodology used was to dig across the area with a shovel to around the depth of the shovel blade (estimated at 25 cm), which was also to the depth of cultural deposit within the building. All shoveled deposit was sieved into the previous hole so that backfilling proceeded across the site with excavation. A site plan was drawn recording the approximate position of features and artifacts. Only artifacts deemed to be special such as coins were shown on the plan. The position of anything else was not recorded; for example thousands of brass pins were recovered but not recorded. The excavated artifacts were then placed in the care of the town caretakers of that time

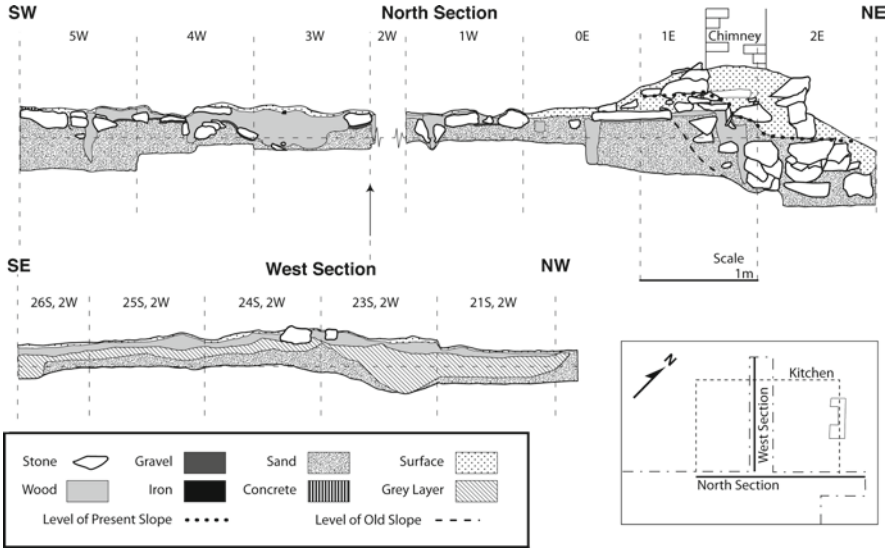

Fig. 7.2 Kitchen trench profiles

and between 1979 and 1990 these artifacts were discarded. The only surviving artifacts are the coins kept by Peter Board as payment for his labor (Peter Board pers. Comm).

The described methodology would have thoroughly disturbed the affected area. Therefore, excavation within the house walls was limited and located to expose the inside details of the walls for recording. Any artifacts found during this phase of excavation were recorded by the meter square in which they were found but spit levels were not taken.

It was discovered that the house had seven cyclone chain roof anchors (Fig. 7.2), not all of which appeared to have been placed or used simultaneously. Each anchor was excavated both to examine the anchor itself and to provide associated artifacts for dating purposes. Since excavating the anchors involved uncovering a mass of tangled machinery, spits depths varied with the ability of the excavator to remove deposit from in and around the machinery. All cyclone anchors were photographed, drawn, and then replaced.

Since historical research indicated that more than one structure may have been built on the site over time, part of the side yard was taken down to a depth of 78 cm in an effort to locate any evidence for a lower occupation level. However, conventional manual excavation did not solve the question of whether other earlier occupations lay deeper within the 2-m high sand mound. Only one building and detached kitchen complex was uncovered during manual excavation; that recorded as features 8 and 11 (Nayton 1990b, c) in 1989. This may or may not have been the original Knight and Shenton store building.

Examination of the excavated material culture in the field was also inconclusive, for the lower material could not be definitely assigned to the 1870s rather than the 1880s. As resolution for this question was essential to the proposed research, it was decided to excavate part of the site to a greater depth using mechanical means. As all cultural material had already been removed, this method was both archaeologically acceptable and expedient. A bobcat and driver were supplied by the Robe River Mining Company, however the logistics (i.e., how small a trench it could excavate) of the available machine meant that part of the western wall of the building had to be recorded, numbered and removed for later replacement. A trench 4.5 m × 7 m × 2.42 m deep was dug from west to east across the side yard and house pad. The trench was dug in layers with the driver skimming the bucket through the deposit surface to the length of the trench with each run. Between runs, the deposit removed was inspected for artifacts and the trench surface inspected for artifacts or features. This exercise proved conclusively that no lower sites existed within the excavation area.

Laboratory Procedures

The laboratory methods had two main thrusts, which together allowed the definition of precise chronological layers within the excavated data. Firstly, a GIS was used to catalog all feature and artifact information. Secondly, a strong emphasis was placed on identifying and dating artifacts.

Site Features

Using a GIS program provided the ability to produce maps showing artifact distributions and features together, as well as manipulating raw data. The Arc/Info system was used initially, and then the data was transferred to the Map Info system. Map Info was used in two ways, firstly, to organize features and their associated artifacts into chronological layers and secondly to analyze the resulting assemblages.

The identification, size, shape, and location of each feature within a square and spit were recorded in the field and later transferred to the GIS program. Each feature has a related data file containing feature information such as type, datum height, total weights for glass and metal, number of nails, diagnostic artifacts, and the relative amount of charcoal according to an ordinal scale of absent, very little, little, some, and abundant.

The same information for spits was also transferred to the program. The information was entered in the same format as it was recorded in the field, which was in spit layers. It was evident during excavation that spit layers across the site did not conform to chronological layers and that deposition rates varied widely over the site. A degree of artifact layering could be observed during excavation although this was difficult to trace horizontally across the site. However, by combining relative

stratigraphy and artifact dating, layers became clearer. Initial attempts to define chronological layers resulted in two conclusions:

1. That a wide range of artifacts needed to be identified and dated to produce enough data for satisfactory chronological divisions.
2. That a method of analyzing this data to produce plausible time ranges needed to be determined.

These conclusions resulted in a strong emphasis on the identification and dating of artifacts. Once chronological layers had been identified, the features associated with them were assembled into map compositions which reflected the proposed chronological divisions.

Artifacts

Artifacts were bagged by spit in the field. Spit bags were opened and sorted in the laboratory with all diagnostic artifacts removed and recorded. Within each spit all whole objects were counted, identical shards were placed in a group and the group counted as one object. Total glass, conchoidally fractured glass and total metal were also weighed and nails counted. The presence and relative amount of charcoal, shell, and bone, according to the described ordinal scale was also noted.

The sandy nature of the soil matrix with its slightly basic PH meant that the cleaning of artifacts could be kept to a minimum. Artifacts required only the occasional gentle brushing to clean them enough for identification. Conservation procedures were likewise kept to the minimum required to prevent degradation since it was felt that a museum conservationist should undertake any more specialized treatment. Metal artifacts were treated for potential salt corrosion problems by soaking them for 6 months in a weak caustic soda solution (see Watkinson and Neal 1998).

Because of the sheer quantity of artifacts involved, material identification was done by eye rather than chemical analysis. This has some implications for dating purposes, as it proved very difficult to distinguish between various types of old plastics and also between modern and nineteenth century clear glass.

Artifacts were classified according to South's (1977) type-ware-class-group classification scheme to allow use of the pattern recognition approach. There are some problems in applying South's typology designed for early American colonial sites to a late nineteenth century site due to the changes in material culture which necessitate changes in classes. Also South's placement of some functional groups is questionable such as food items like nuts being placed under "activities" rather than "kitchen" and clay tobacco pipes being placed in a class of their own due to their usefulness as a chronological marker.

Orser (1988) has produced a less problematic ordering but a modified version of South's typology, which changes classes within groups but does not switch classes between functional groups, was initially followed to allow future research into the applicability of South's frontier pattern to the northwest. This ordering of the material within the computer program was found to be flexible enough to reorder groups

and classes to compare the assemblages directly to methods and analysis utilized by others during the course of chapter nine.

Because of the heavy emphasis on identifying artifacts for dating purposes, description of artifact types was more detailed than usual in pattern recognition studies. However, this has resulted in an artifact type catalog, which is itself the size of a book, and therefore it has been unable to be included in this volume. It is hoped to publish the catalog at a future date.

Mean Analysis

Analyzing the data to obtain reliable chronological divisions was difficult, so South's mean ceramic date formula (South 1977) was modified for use on the site. South's formula is quite simple; each type within the assemblage is multiplied by its frequency of occurrence. The resulting numbers are then added and the total is divided by the total frequency of the types to produce a mean date.

The formula, as used by South did not incorporate a multitude of different classes therefore a suitable measure of frequency which could be used across classes of different materials and weights had to be utilized. Minimum numbers are a measure of frequency which avoids the bias of shard counts or different material weights and were therefore used in this analysis.

The mean was calculated for each individual spit using the minimum number of artifacts present within each spit. On a site-wide level, these numbers would not represent accurate minimum numbers as they do not allow for instances where shards from the same artifact are spread horizontally or vertically across more than one spit. However, the use of minimum numbers at this stage is purely to calculate dates based on what is present within each spit. Where spits are amalgamated vertically during the process as outlined in Fig. 7.3, minimum numbers have been recalculated. They have not been recalculated horizontally as part of the mean dating process.

This was for two reasons, firstly, horizontal amalgamation introduces the problem of determining where the spread of shards from one object ends and the next begins. Such analysis more properly belongs in Chapter 8 which examined activities across the site rather than in initially determining chronological layers. Secondly, horizontal pooling within the mean process outlined in Fig. 7.3 is a finishing step designed to give a general mean date for large areas of the site. By this stage the numbers of artifacts involved in the calculation is large and the possible refining of minimum numbers produced by horizontal amalgamation is not expected to influence the general mean date produced.

Applying the modified calculation to the raw spit data did not initially produce the hoped for clean division of the site and further analysis was needed to identify and remove factors that confused the chronological reconstruction. Figure 7.3 shows the order in which analysis proceeded, the steps of which are explained below.

It should be pointed out that the aim of the analysis is to see whether chronological ranges, of the fineness required to test change through a short period of

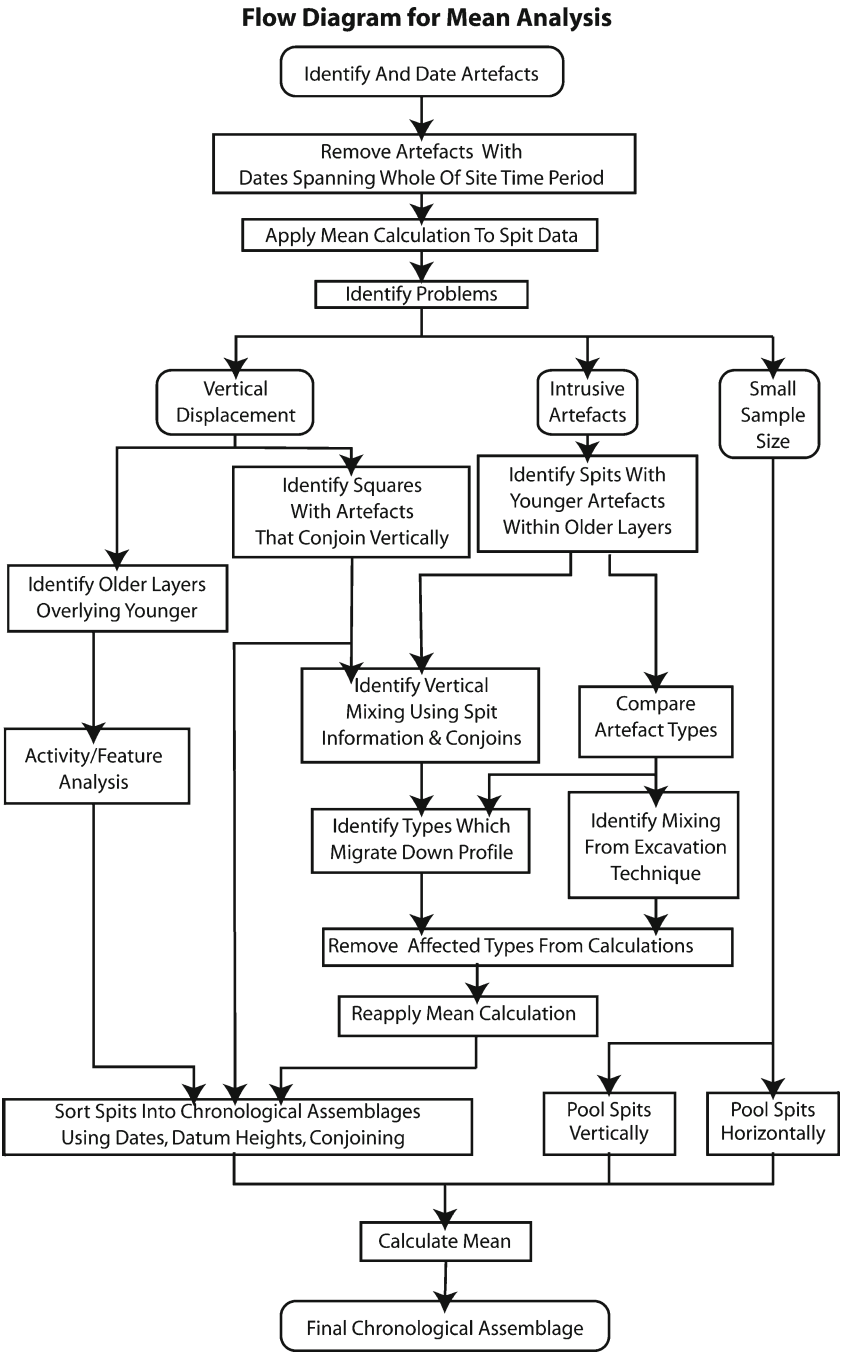

Fig. 7.3 Flow diagram for mean analysis

time, can be plausibly reconstructed for a site such as the Knight and Shenton Store. The divisions finally arrived at do not violate stratigraphic order but they cannot be compared to an independent set of evidence such as visible stratigraphic layers. Therefore, derived site layers are tested against archaeologically registered historic events that occurred at the site, at the end of this chapter, to determine if the dating for the layers and that of the historic events concur. The method has also been applied with success to three other historic sites in Western Australia that also had archaeologically registered historic events (Nayton 1998a, b, c). Wider application of the method on sites with visible stratigraphic layers has also occurred with the method reliably producing fine chronological divisions in excavated data (Nayton 2000, 2002, 2005, 2008, 2009a, b).

Identifying and Dating Artifacts

Artifacts from the excavation site varied in their potential for precise dating. The most abundant artifact classes found were bottle glass and bottle seals, architectural metals, and ceramics. Other classes such as clay tobacco pipes, buttons, and bullets were also quite common.

As the building had burnt down, artifacts relating to its construction were numerous, especially within the surface spits. As a group these artifacts were difficult to date, and such dating, as was possible, was mainly related to when different materials such as aluminium and asbestos became available. Some dating of technological change was possible, such as the provision of electricity, kerosene lighting, carbon zinc, and modern batteries and the change in corrugation size of corrugated iron. Only two items could be dated by the name of a business or their patented product. These were Carpenter's rim lock number 60 and Dietz and Co, manufacturer of paragon kerosene lamps.

Originally, there was a possibility that nails found on the site could be used as chronological markers, but this proved not as helpful as first thought. The Knight and Shenton store site extends the period of secure dating, by association, for nail types into the twentieth century but previously published dating on nail types to help sort and date chronological layers within the site is scarce. Varman (1987) showed that early wire nails can be precisely dated, but there has been no further published research on other later nail forms. Sixty six different types of wrought and wire nails, screws and bolts were found on the site, many of them being fairly common across the site and thus potentially of use for dating assemblages if the nail type has been previously dated.

There are however, three problems with using nails as chronological markers. Firstly, a nail can enter the archaeological record at any time from construction to final disintegration of a structure; therefore a single nail has limited use as a chronological marker. A grouping of one or two nail types associated with a feature is most likely to be from construction or demolition. Nails from the construction phase can help define the date a feature was built while nails associated with the

end of a building are not usable for dating purposes as they would be certainly older than the layers in which they appear.

Secondly, the nature of nails themselves causes a problem. While within a building they are protected from the elements and generally do not suffer any degradation, but once they are in the ground and become part of the archaeological record oxidization proceeds and they become more difficult to identify. Early nails on the site in particular could often only be separated into wrought and wire categories. Occasionally, the wire categories could be subdivided into early and late types using the shaft thickness. This does place limitations on the usage of late nineteenth century nail types. Nail types from the twentieth century are much less problematic due to less exposure to the elements and better quality steel and galvanization.

The last problem is the level of visibility of nails in the historical record with historical nail forms being difficult to trace in historical records. There has also been little research published on nail types found archaeologically. Considering these limitations, nail types were of limited use for distinguishing chronological layers at the Knight and Shenton store site. Nails dated by association at the store site may however be of use for comparison purposes when archaeologically dating other sites in the future.

Furnishings as a group also resisted dating. This group consisted largely of small brass facings, nails or brackets, and small shards of glass or ceramic ornaments. While it is sometimes possible to find a particular motif illustrated in a collector's guide or mail order catalog, such a search is so time consuming as to be impractical when faced with an array of over 100 different types, only one of which carried a registered number.

Ceramics as a material covered a wide range of functions from buttons to furniture castors, the largest category being table and storage ware. Ceramic material therefore ended up being placed within a number of functional groups. Most shards were small but were recognizable as being mostly mass produced, unmarked, late nineteenth century to early twentieth century wares. Service ware ceramics were identified as being of earthenware, porcelain, refined white bodied earthenware, and stoneware (as per the distinctions made by Majewski and O'Brien (1987). The largest proportion of service ware ceramics on the site were white bodied wares covering a range of vitreous and semivitreous body types.

It was possible to separate the various types of table and storage ware on the basis of ware, body color and texture, decoration technique, and the color and pattern of the decoration. This did give a clear division of types within the stone ware and earthen ware categories. For decorated white bodied wares and porcelain identifying the decoration pattern was more problematic because most shards were under 4 cm across. The fragments of patterns were therefore too small to accurately match with documented patterns in ceramic reference books. It is therefore possible that some of my "types" are actually different parts of the same pattern

Only one motif on service ware was able to be identified from published ceramic source books. This was type 131, which displayed the Asiatic pheasant motif; identified as the second most popular motif used during the second half of the nineteenth century (Coysh and Henrywood 1982). Of the ceramic shards from the store

site none carried British Patent Office registration marks, although some had dealer and makers marks. One of these, A. Bros., was from G L Ashworth and Brothers and is dated after 1862, (see Godden 1964).

Ceramic ointment jars were much more dateable due to their function, color, and advertising carried on the pot. They often carry the manufacturers name and address and dating for these could be perused through advertisements in periodicals of the time. One black Holloway's jar was dated to 1867 to ca 1875. Another Holloway's jar had a classical motif and was identified as being from a later period of 1875–1895. Holloway's changed address in 1884 as indicated by Perth advertisements.

To set the excavated ceramics more firmly into a West Australian time frame, they were compared to ceramic collections from shipwrecks off the West Australian coast. Extensive collections are only available from earlier shipwrecks which have been excavated (*unidentified whaler* 1810, *Rapid* 1811 and *James Matthews* 1841). More limited collections are available from the *Cumberland* (1830) *Elizabeth* (1839) *Lancier* (1839) *Eglinton* (1852) *Lady Lyttleton* (1867) *Xanth*o (1872) *Hadda* (1877) *Star* (1880) *Day Dawn* (1890), and the *Europa* (1897). Small collections of mainly glass are available from other sites.

Matches were not generally found with ceramics from shipwrecks earlier in the century. Only one match was made from these wrecks that of a large brown glazed earthenware pot with four lugs decorated with an embossed square key and circle motif. The pot was found on the *Rapid* an American China trader wrecked in 1811 and matches type 34.

Plain white plates with type 24 bodies were abundant on the iron barque *Europa* (1897) indicating that completely undecorated whitebodied wares were available and perhaps popular in 1897. Banded hospitality ware was found on the *Day Dawn* (1890) an American whaler and in the Fremantle Long Jetty collection. Blue, red, and green banded ware are fairly common in Western Australia (Curator WA Maritime collections, personal commumnication) being used in hotels and on shipping lines including the Adelaide Steamship Company at Cossack from 1883.

The most matches came from the colonial whaler *Star* wrecked in 1880. The *Star* collection contained one matching type of banded ware (type 101) with four blue hairlines around the rim of a vessel and three matching transfer prints. The transfer prints were type 137 – the Asiatic Pheasant motif, type 119 – a motif featuring bunches of flowers, and a large Rouen motif with a rope border. The motif from the *Star* was in black while that from Cossack was in brown. The *Star* also contained a brown example of the linked chain motif featured in type 127 (green) and 156 (purple). These motifs show a lot of white base and indicate that this type of revival transfer printing was already becoming popular by 1880. The start date of revival printed ware at Cossack should therefore be earlier than 1880, but not as early as 1870 as no matches were made on the *Lady Littleton*, *Hadda*, and *Xantho* collections. A mean date of 1875 has been taken as the start date for this type of ceramic.

Published material from two large New Zealand collections were also used for comparison. The Omata Stockade collection 1860–1864 (Pricket 1981) yielded an earlier Holloway ointment bottle exactly the same as the Cossack jars except for the

address, which is 244 Strand. Holloway moved from 244 to 533 Strand in 1867. The Cossack specimens have the legend "late 244 Strand" which suggests that they were from a period just after the move. The only other matches with the Omata collection were a penny inkbottle and green and blue banded hospitality ware.

The other published collection used for comparison was the Clutha Valley Chinese collection (Ritchie 1986) which has an overall time range of 1869–1925. This collection is from several sites in the Clutha Valley. Matches were made with artifacts from 5 of the 15 sites including three from the major site of Chinatown.

From the Chinatown collection (1869–1920) matches were made with Types 45 and 48 which are both decorated with gilt hairlines. A match for type 140, a geometric decal print was also found although Ritchie identifies the pattern as transfer printed on the Chinatown artifacts (Ritchie 1986:311). From the Rapids site (1870–1900) came a match with Type 170 a geometric transfer print. From the Populars (1885–1895) and Ah Wee's (post 1890) came red and green banded hospitality ware. A similar Rouen pattern to Types 119, 126 and 158 was shown as coming from Ah Lum's (1880–1925) and Ha Fong (1875–1900). Ritchie states that this pattern is the most common transfer print on the studied ceramics (Ritchie 1986:288) so it is likely that he has examples from most of the sites.

Comparisons could also be made with a penny inkbottle (Arrowtown 1870–1925) and with a Holloway's ointment jar (QB2 > 1895). The ointment jar is the same as those from the Knight and Shenton Store with the Oxford street address, however the word "late" is not shown with the address.

It was not possible to match any of the flow blue ceramics with those from the Chinese sites. Although Ritchie states that blue on white designs were used on a wide variety of vessel types (Ritchie 1986:225) he has only a few within his collections.

These comparisons have demonstrated that few of the Knight and Shenton Store site ceramics are likely to be curated items from earlier in the century. Even the romantic scene transfer printed wares are more likely to belong to the second half of the century, manufactured during the declining years of the industry (1860–1880), than to the height of the romantic period itself (1845–1860).

A general guide to dating was established through changing technology and style (Fig. 7.4). The time ranges show that following South (1977) in using only ceramics for dating would not result in the desired short chronological periods as most type ranges are around 50–60 years. While the two Holloway designs will be of some use in particular spits they occur too infrequently to be of general use in establishing site-wide chronological layers.

Another extensive material category is glass. Glass includes several functional classes, the largest of which relates to bottles. The technology of bottle making made rapid advances during the time span of site occupation, giving bottle glass diagnostic shards some potential for dating purposes. Whole bottles were not numerous and were found largely in small refuse pits and one cyclone chain anchor pit. Whole bottles were sorted into numbered types based on their combination of features. Diagnostic shards could not be definitely assigned to these numbered types as finishes and bases were used in different combinations. Diagnostic shards were therefore sorted by color, technology, and markings into catalog types and

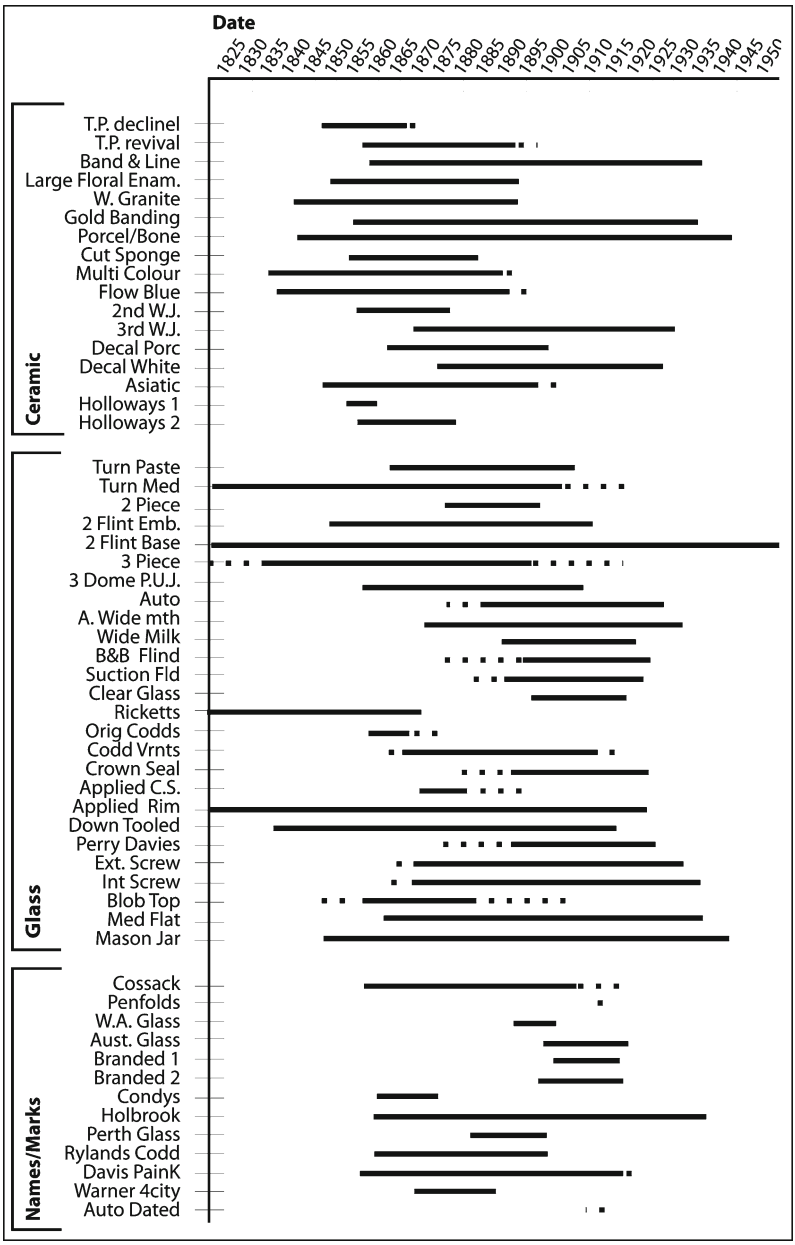

Fig. 7.4 Ceramic and glass production chronology

dated by the technological evidence displayed. Glass without diagnostic traits could only be recorded by color and weight.

Dates obtained from diagnostic shards are somewhat problematic as different technological procedures indicating differing dates can be used on different parts of

the same bottle. The whole bottle would therefore be dated by the most recent technology displayed while a shard from the same bottle may give an older date as it displayed only the older technology.

The bottle class covered all nonpharmaceutical bottles and jars and is a class, which has in general, been well studied both in Australia and overseas. Types have been established by shape and technological changes. Description of bottle types followed that of Parks Canada (Jones and Sullivan 1989) both for whole bottles and for diagnostic shards such as bases and finishes. All bottle shapes most often associated with pharmaceutical uses were included within the pharmaceutical bottle class. They may not all have contained medicines, as perfumes, household products and even some drinks were also contained in these bottles types. However, such bottles were included in this class unless there was direct evidence that their contents were not pharmaceutical.

Research has investigated when bottles created using new technology reached Australia (Boow and Byrnes 1991), two manufacturing changes were identified as being of great use in dating bottle glass found on a late nineteenth century site. These are the use of automatic and semiautomatic bottle making machines in the 1890s and the development of crown finishes in 1892.

Bottle making machines leave distinctive mould marks on bottles from the beginning of manufacture to the end and these marks are recognizable and useful to the archaeologist. Boow and Byrnes (1991) postulated that dates of machine made bottles on Australian sites may also vary according to the place of manufacture. European bottles made on semiautomatic machines could have been imported to Australia from 1890 onwards, whereas bottles of fully automatic manufacture would be unlikely to date before 1910. On the other hand American semiautomatic made bottles are more likely to date from 1910 and those from fully automatic machines were arriving in 1904. The type of glass can also influence the date, depending on whether the bottle was "black glass," or flint glass which was available from 1900 (Blow and Blow) or 1910 (suction).

Crown seal bottles with their distinctive shape are easy to identify in the archaeological record as are the bottle caps. The earliest finishes were made by hand using a special tool for finishing which left no mould seams such as the one found on bottles produced by semi- or fully automatic machines. The crown finish was not widely used for hand produced bottles due to the fact that a perfect seal could not always be guaranteed. However, after the introduction of fully automatic bottle making machines in America in 1904, the finish was extensively used. However, Boow and Byrnes point out that most of the bottles imported into Australia came from Britain where fully automatic machinery was not in use until 1915–1925 and this dating is likely to be more common on Australia sites. Therefore, shards with the distinctive machine made mould marks could be from 1890 but are likely to be more numerous on an Australian site after 1910 when Britain started producing this type of bottle. Machine made crown finishes on these bottles would occur after 1915, however hand-made crown finishes are more likely to be dated between 1892 and ca 1915, giving the potential of using this gap between the invention of crown finishes and machine made bottles as a dating tool.

Technological changes such as these are useful for precise dating. Several such changes occurred in the 1880s and 1890s, and pre- and post ca 1920 can be easily distinguished. However, archaeologically there are several problems with using glass for dating. Most of the dating of Australian sites has been done in Eastern Australia and may not be applicable to Western Australia. Western Australian Glass was manufacturing crown seal bottles for the Swan Brewery by 1915, at a time when crown seal bottles from Britain were only just reaching Eastern Australia (Wellborn 1988). Also the practice of recycling bottles was known to be widespread in Australia (Stuart 1991).

A method of dating artifacts with great potential is the date of registration of trademarks. Paper labels do not survive well over time, whereas embossed or acid etched marks on bottles do. Late nineteenth century medicine bottles were often embossed, but this technique was rarely found on alcohol bottles. Many bottles remained plain and those which can be dated by their markings may indicate an earlier incorrect date due to them being reused.

Figure 7.4 also summarizes bottle dating information from the Knight and Shenton store site. Marked glass is not as common as that which can be dated by technological features. Using marks and names gives a shorter time range, whereas using the technological features gives a longer time range. Every spit contained glass making it a potentially useful dating marker, with diagnostic shards being common, however recycling of bottles is a potential problem. The problem of reuse will be discussed at the end of this chapter.

Other glass artifacts found were jars, glass from kerosene lamps, glass tableware, ornaments, glass bottle closures, beads, buttons, and glass marbles. Most were dated by technological change. South (1977:95) separates tumblers from stemware, decanters, dishes, and other glassware. This is because on his sites stemware is not necessarily from drinking glasses whereas tumblers were always used for drinking. At Cossack all stemware found were drinking glasses therefore it was a more natural division to place them with the tumblers in a drinking glass class.

Unlike tumblers, the shape of which could be found in Parks Canada's Glass Glossary, (Jones and Sullivan 1989) the stemware came in two main bowl shapes, which are not described in the glossary. These shapes are the champagne bowl and a straight rimmed ovoid wine goblet, both shapes which are familiar from modern glassware. Foot formations were all plain conical with collars and steps of various sizes. None of the stemware appeared to have knobs on the stem although as no stems were complete this possibility cannot be ruled out. Shards were divided into types on the basis of shape, decoration, color, and differences in the glass used.

Lead sealing capsules as artifacts should be the ideal chronological markers, being noncurated items which are plentiful in the archaeological record and mostly embossed with maker's marks which can be dated to a series of short date ranges which together cover a long period of time.

Lead capsules secured with wire twists were used for sealing bottles from 1843 to the mid-1920s when they were replaced by other forms of closure including foil capsules. Most of the capsules cannot be divided into type on the basis of material or form although some capsules from the later period are made from a thinner more friable lead foil. From 1862, many carried trademarks impressed onto the top and

sides of the capsules. These trademarks were used to divide the capsules into types that could be used as chronological markers.

Eighty-eight different designs were found in the excavation, 41 of which have been dated (Fig. 7.5) with some brewers represented by more than one design. Most of the records of English trademark designs were destroyed in 1963 leaving only the Bass designs able to be dated from trademark applications. Post Office Directories (Kelly 1884–1930; Sands & McDougall 1886–1930; Sands & McDougall 1906–1930; Wise 1870–1930) were used to date when and where businesses were being operated by locating specific addresses and people, rather than attempting to date the actual designs. Perth Newspapers carried advertisements indicating when

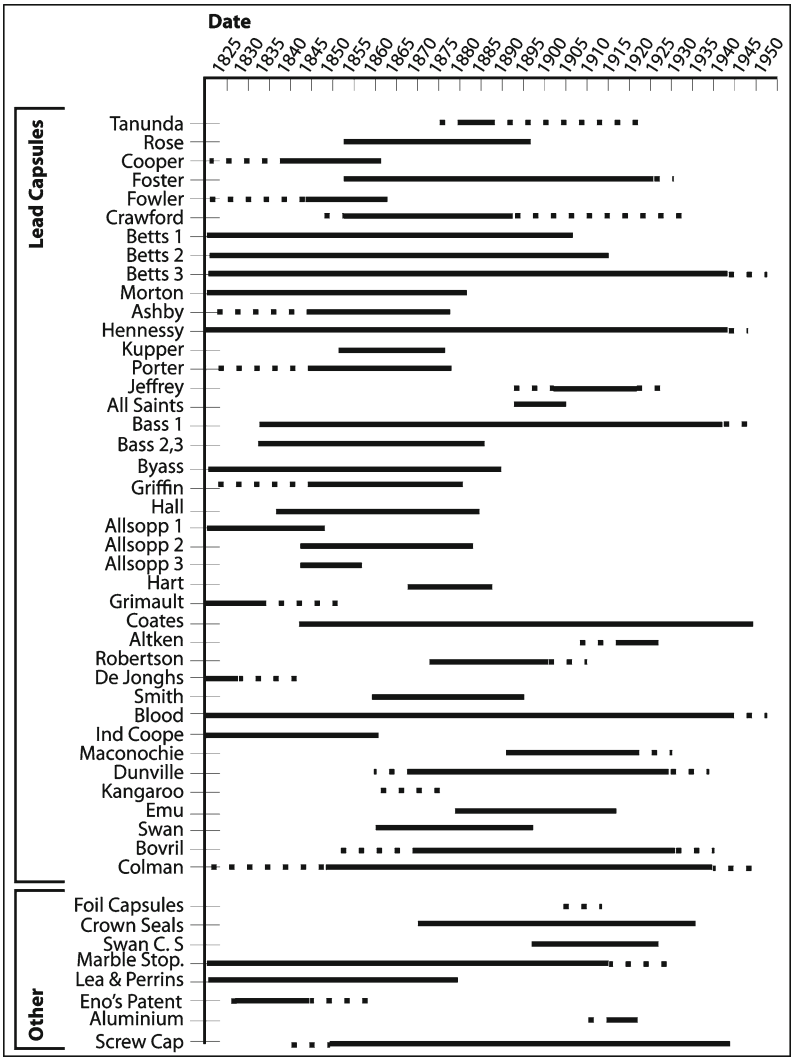

Fig. 7.5 Chronology for lead bottle sealing capsules

the goods were available and these were very useful before 1884, which is the date of the earliest London post office directory, the main source used for dating manufacturers.

The dating shown in Fig. 7.5 indicates that lead seals are potentially a very useful dating tool. The only products that could not be dated to a time span of less than 30 years were those of Blood, Wolfe and Co spirits, Hennessy Brandy and Colman's Mustard. Betts and Co designs cover a long time span because Betts made the lead capsules, covering the entire time period. Many of the designs are dated to a 20-year time span with some having a range of less than ten.

Lead seal capsules are not as numerous as ceramics and glass but there are enough of them across the site to be useful for dating purposes when combined with other types of bottle seals, such as crown seals, marble stoppers, and foil capsules. They were not reused, were discarded at the time the bottle was opened and are subject to very little curation.

Clay tobacco pipes are also a potentially useful artifact for these same qualities. They also carry distinctive manufacturer's marks and survive well in the archaeological record. Binford's formula for dating pipe stems is not reliable for late nineteenth century stems (Walker 1983:90–101) so dating was by manufacturer's mark.

Dating short time periods is however difficult using maker's marks. According to the catalogs of the main Scottish pipe makers (Gallagher 1987), once a pipe was in the catalog it remained, even though other newer types were entering production all the time. A pipe available in 1873 could still be bought in 1900.

Another dating point for clay pipes hinges on the McKinley Tariff Act of 1891. This act required that goods imported into the United States had to be marked with the country of origin rather than just the town of origin, as had been the previous practice (Godden 1964:11). The act was law only in America, but once the mould for a pipe had been altered to suit this requirement, it would been used that way regardless of destination (Sudbury 1980:37; Walker 1983:3). As all the pipe shards from this excavation carry town of origin markings rather than city, this suggests that they are all pre-1891, however, if the pipe type was made for a non-American market this Act would not have altered their moulds.

More work needs to be done before clay tobacco pipes can be utilized fully to precisely date occupation layers. This applies to the historical data base, cataloging information on imported goods, and the archaeological data base could use well dated short-term sites or pipes dated by association.

Wooden and Bakelite briar pipes, cigarettes, and cigarette packets were also found on the site. All proved to have some dating potential. A related group of artifacts on which a great deal of chronological research has been carried out in New Zealand is matchboxes (Anson 1983; Bedford 1985). The matchboxes recovered from the excavation site were badly corroded but all but one fragment could be identified (Fig. 7.6). However, the small numbers of this artifact class means that they were of little use as chronological markers.

Clothing hardware also has some potential for dating purposes as shown by Cameron (1985); the button chronology in Fig. 7.6 is based largely on her work. Clothing items ranged from belt buckles to jewelry. Buttons were plentiful at the site;

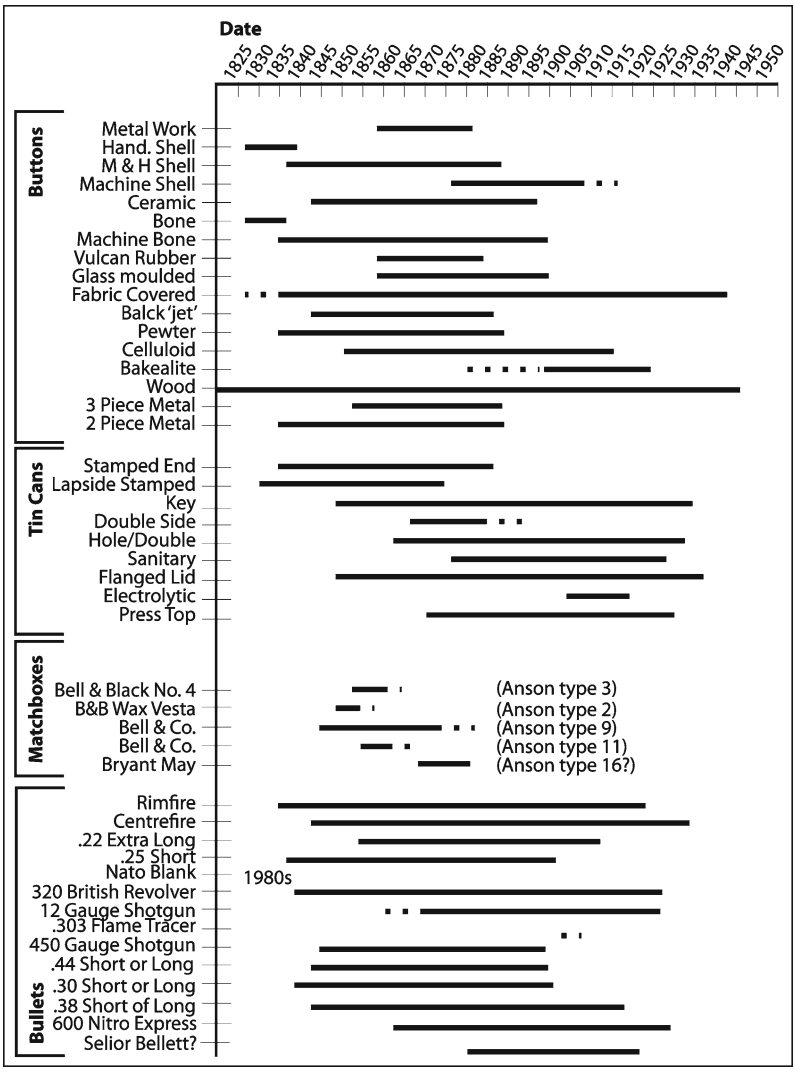

Fig. 7.6 Chronology for match boxes, clothing hardware, and bullets

in all there were 114 different designs grouped into nine classes based on material. The shell button types were given *termini ante quem* of 1900 unless evidence of mechanical polishing could be detected. However, this proved difficult to assess reliably and consequently few shell buttons that were assigned to the twentieth century. Some buttons such as metal work-trouser buttons and rubber buttons do appear to have potential as chronological markers but most are dated to periods of 50 or 60 years.

The site also yielded a few, mostly British or Australian coins. Information from the Australian Mint (Public relations officer: pers. comm.) indicates that Australian coins have a use life of approximately 30 years. This time span is thought by the mint authorities to also hold true for late nineteenth century Australian and British coins.

Items relating to food, food handling, or food procurement differ in their potential as chronological markers. Organic material such as bone, shell, and fruit pips cannot be usefully dated on a historical site. Food bought in tin cans, glass jars, or foil packets, have more potential. All the tin cans located at the site could be dated by manufacturing technology (Rock 1984) but contents could not be identified as the paper labels had not survived. Whole cans were not numerous and were mostly found together in rubbish pits which reduced their use to dating pit features rather than site-wide chronological layers. Identifiable shards were slightly more abundant but still not numerous.

Artifacts relating to hunting and fishing were also found. Nylon fishing line was dated by the material but hooks and lures remain undated. Bullets fell into three categories: Small caliber rimfires, larger caliber centrefires, and shotgun cartridges (Barnes 1989), and were plentiful enough to be useful if they could be dated. Whole bullet cartridges, cartridge cases and lead bullets were found on the site. Rimfires were generally available from 1857 to 1945, although 0.22 cartridges are still made today. Centrefire cartridges have been manufactured since 1868, and are found in two types, black powder (1868-ca1910) and smokeless powder (1892-present). However, cartridges originally designed for black powder could be loaded with smokeless which extended their commercial life. Breech loading shotguns were originally made in a large variety of gauges and have been in use since the late 1840s, but today only six types are available.

Identifying a specific type of cartridge can shorten the more general date ranges (Barnes 1989). A small bullet similar to a rimfire was identified as being made by the Czechoslovakian firm of Selior Bellett. It differed in that the firing pin struck horizontally across the entire head rather than just on the rim, and is similar in size to the BB cap, used for indoor target practice. There were seven types of rimfire cartridges found. Two were American cartridges, the 0.25 Short (handgun) dated 1860–1920, and the 0.22 Extra Long (rifle) dated to 1880–1935. The remainder of unidentified rimfires may be British considering the origins of much of the other artifacts from the site.

Two military cartridges were identified, one being a 1980s NATO blank and the other the sawn off base of a flame tracer cartridge dated to 1942 by the head stamp (Huon 1988). Two shotgun cartridges types were identified and dated (12 gauge 1900-present and an obsolete 450 gauge dated 1870–1920). Included in the remaining centrefire types was a 320 British Revolver (1870 – present) and an unidentified type that may be British.

Five lead bullet types were found, three of which were identified as belonging to Rimfire cartridges. These were the 0.30 Short or Long (1860–1920), the 0.38 Short or Long (1865–1940), and the 0.44 Short or Long (1865–1920), this dating does need to be confirmed by comparison with British rimfires. There was also a bullet for the 320 British Revolver (1870-present). One other bullet was quite a surprise, being a 0.64 caliber. According to Barnes (1989) the only cartridge of this size is the 600 Nitro Express (1903–1962) which was used in the biggest and most powerful English elephant rifle at the time. Some professional ivory hunters considered it overpowered, even for elephants, so what it was doing in Australia is difficult to imagine.

The dating of bullets and cartridges follows that of many other classes of artifacts, in that there is a difference between types available before the 1920s and those available after. Although many cartridges can be tightly dated, those from the Knight and Shenton Store site were in use over a span of 50–60 years, making them less useful as dating markers.

Other personal items found on the site were toys, which were mainly ceramic, beads, medical products, writing instruments, tools, toiletries, and items relating to travel. Ceramic toys were dated by the same methods as storage and tableware. Toiletries, writing materials, and medicine products were dated on material or technology.

Analyzing Chronological Markers

Once artifacts had been identified and dated, problems with using them as chronological markers could be identified. Nails were removed from the chronological layer calculations because of the problems associated with how they enter the archaeological record. They were used, however, to help date when particular features were built.

Many artifacts were found to have extremely long time ranges. It was felt that artifacts that had a time range spanning the entire period of site use would not be of use, therefore they were excluded from the calculations, as were artifacts that had uncertain dates. Artifacts were dated by shortest firm date range available. For instance, lead bottle sealing capsules were available from 1843 to 1930. All unmarked capsules were given this dating. However, trademarks were only available from 1862 so any capsule with an unidentified trademark was given a date of 1862–1930. Trade directory information allowed much shorter date spans for identified trademarks. However, eight trademarks were present in the earliest available London Post Office directory (Kelly's 1884) and so, were available before 1884. These were given a *terminus post quem* of 1862, as this was the nearest available firm date.

Some problems with dating by eye, in particular materials such as old plastics, and nineteenth century clear glass that had not solarised, were anticipated. These artifacts were also removed from the dating formula.

Applying the Mean Calculations

Once the modified mean formula had been applied and mean dates obtained for all dateable spits, the assemblage was analyzed to isolate identifiable "noise." After the spit dates were examined for stratigraphic integrity and anomalies looked at closely, it was found that three factors appeared to be disrupting the expected pattern of increasing age with depth. These were identified as vertical displacement, intrusive artifacts, and small sample size.

Vertical Displacement

Spit dating and conjoining artifacts were used to determine vertical displacement which was found to occur in two common forms. The first being a spit with older artifacts overlying spits with younger artifacts, and the second being spits (sometimes all the spits in a square) which contained both older and younger artifacts to a degree that cannot be explained by recycling or longevity of use of the older artifacts. Both types of displacement indicate disturbance. The first form indicates that disturbance in the vicinity has led to older materials being redeposited in the square and becoming incorporated into its stratigraphic sequence, while the second form points to disturbance of the sediments within the affected square itself. As such they demonstrate past activity on the site and are useful for activity and feature analysis. Affected squares or spits are not however useful for dating site-wide chronological assemblages and so were removed from further mean analysis with a total of 18 squares (56 spits) removed.

The third, rare form of vertical displacement involves spits that contain one or two artifacts which were clearly intrusive but which did not fit the site-wide profile of intrusive artifacts detailed below. In these cases, a localized disturbance is suspected. The first spit is s34w10s4, which contains a 5×5 cm bottle heel shard from an automatically produced stubby type bottle. This square is within an area affected by a fire in the late 1880s and the shard was found in the layer underneath the scattered charcoal layer that marks the fire. In the adjoining square the scattered charcoal layer is not observable, suggesting the sediments in this square have suffered some disturbance, as does the presence of a 1955 threepence at the same level as the anomalous recent bottle shard. While two other coins have apparently moved one spit down the profile (see intrusive artifacts), this coin is the only one that is intrusive to such an extent. The presence of two abutting anomalously recent artifacts, together with the stratigraphic evidence, suggests that there has been a degree of disturbance in s33w10 which has impinged slightly on s34w10.

The second spit is s26w3s3, which contains a Swan Brewery crown seal bottle cap that most likely dates to after 1921. The placement of this artifact cannot be attributed to any blurring of chronological divisions during excavation as the spit, which is dated to 1902 on the rest of its contents, is overlain by another turn of the century spit. The Swan bottle cap is also not one of the groups of intrusive artifacts that can be recognized across the site. The affected square has a profile of chronological layers which does not differ markedly from those on either side of it, suggesting that no generalized disturbance has taken place. Both s26w3 and s26w2, however, contain two sets of posts close together. One of each of the post sets relates to the adjunct wooden kitchen built in the early 1880s. While the other two posts are from the 1930s galvanized iron shed built next to the abandoned kitchen. I infer that either the bottle cap was dropped into a hole that had been dug for the 1930s posts, or the bottle cap was pushed down through the profile when the post in s26w3 was sunk into the deposits. In these two cases the displaced artifact has been removed from further chronological analysis rather than the entire spit contents.

Once the affected spits and artifacts had been removed from consideration it was found there were still a proportion of squares left which had artifacts conjoining across different spits. Artifacts also conjoined horizontally across squares to spits of varying datum heights. These spits were distinguished from the disturbed spits by not containing a mix of old and new artifacts and, rather indicated areas of uneven ground surface in the past and variable deposition rates across the site.

Intrusive Artifacts

The general lack of weathering and abrasion on artifacts and the very small amount of nineteenth century clear glass, which has solarized, suggest the majority of artifacts were buried quickly. However, the dating evidence suggests that most artifacts then remained at the level they had been initially buried rather than burrowing down through earlier deposits. There are nonetheless, a small proportion of artifacts that did not.

Intrusive material is identified as material that is out of place within a square or spit which otherwise appears chronostratigraphically coherent. It was visible in the database as one or two artifacts that are more recent than the time ranges of the bulk of the material within the affected spit. This phenomenon of course cannot be attributed to curation or reuse of the artifacts in question since then we would expect precisely the opposite pattern of a few anomalously old artifacts in the assemblage. The intrusive artifacts fell into two groups, those that appear a spit lower than their date range suggests is correct and those that often work their way well down the profile.

The first group involves 23 artifacts, a shard from a circular tobacco tin, a lid removed from a tin can with a wheel-type can opener, two coins, two shards of a thin aluminium gasket, five bottle shards, six lead bottle sealing capsules, one foil capsule, four lead headed nails, and a cigarette filter. It is thought that these cases are not the result of site occupational activities but of the excavation method. Chronological layering could not be distinguished during excavation due to the lack of visible stratigraphy and the complicated stratigraphic variations across the site in the past. Spits were therefore excavated to a standard predetermined depth unless a visible feature was encountered. In this situation it is inevitable that there will be cases where a division between spits, closely but not exactly, corresponds to an analytically detectable chronological division. With the result that one or two artifacts are excavated in the top centimeter or so of one spit but chronologically belong to the spit immediately above. Of course, these artifacts are not really intrusive at all, but appear so owing to excavation by artificial spits. This argument is supported by the bottle shards within this group, which contain a portion which are indistinguishable from more numerous shards in the spits directly above them. The shards within each square together represent one artifact which has been artificially divided between two spits, which are in general, chronologically distinct. Hence, all 23 have been restored to the chronological assemblage overlying the spits they had been excavated in.

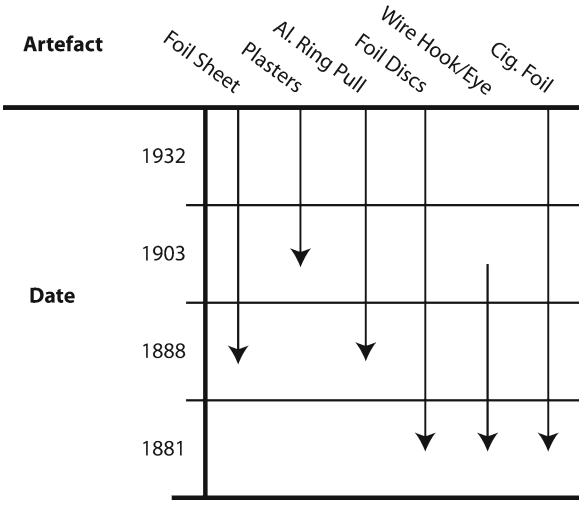

Fig. 7.7 Intrusive artifacts

Figure 7.7 shows the second group of artifacts and the extent to which they have moved down the chronological profile. The group consists of small pieces of foil from cigarette packets, wire hook and eye clothing fasteners, foil discs from metal and cork bottle closures, aluminium can or bottle ring pulls, small pieces of foil from food packets, one foil capsule, and two plastic medical plasters. Altogether 53 artifacts form this grouping with 6 found in the 1881 assemblage, 17 in the 1888 assemblage, 22 in the 1903, and 8 in the nonsurface spits from the 1919 assemblage. The artifacts share a characteristically small thin shape. Stone points which also have similarly small thin shapes have been proved to have moved down sand profiles on prehistoric sites within Australia (Richardson 1992). These artifacts are considered suspect as chronological markers. They are also considered likely to falsify database analysis and have been excluded from the assemblages to be analyzed. The mean dates of spits affected by intrusive artifacts were then recalculated.

Small Sample Size

The remaining spits were combined into tentative chronological assemblages using mean spit dates and stratigraphic information such as datum height, and the presence of discrete layers such as the charcoal and gravel feature associated with the late 1880s fire in the side yard.

The presence of very little or no dateable material within some spits created the problem that the affected spits returned either no mean date or a clearly unreliable date. The problem was particularly noticeable when the artifacts in question, themselves have long time spans. For instance material deposited at the turn of the century

could appear either too young or too old for its general chronological placing depending on whether the date range of the artifact in question was mainly nineteenth or twentieth century. As these spits could not be reliably assigned to a particular chronological division by analysis, conjoining artifacts, datum height, and other stratigraphic information had greater weight in placing them within chronological assemblages.

Once the overarching chronological divisions had been achieved, the dating of particular squares or features could be improved by pooling artifact information, either vertically when two spits from the same square fell within the same assemblage, or horizontally to date a particular areal feature or area. When spits were pooled the mean was calculated afresh from the median dates of the incorporated artifacts rather than by the mean of the pooled spits (which procedure would have ignored variation in sample size between the pooled spits).

Areas pooled together were the N/S kitchen trench; the E/W kitchen trench to s26w0; the eastern, down slope, extension of the E/W kitchen trench; the backyard; the west sideyard; the west wall; the east wall; and the frontyard. These areas reflected both physical separation such as the different yard and wall areas and different depositional contexts, for example the various different kitchen depositional contexts were separated from each other and from the main backyard area. The former presence of a galvanized iron shed within the backyard immediately north of the house foundations showed as an area of younger means within the backyard giving a subassemblage with a mean date of 1938. Finally, all the means of assemblages from the same time periods were amalgamated to form five chronological assemblages.

The pooled dates for the various areas showed quite tight date ranges with the lowest assemblage ranging from 1880 to 1884, the next from 1887 to 1891, then 1902 to 1907, 1913 to 1925, and finally 1937 to 1945. In all squares the calculated dates are stratigraphically consistent moving from older to younger up the profile.

The top two assemblages show greater ranges because they both contain a large number of surface spits. The two assemblages that appear separate when grouped by dates are in fact shown to be part of the same layer when cross-referenced by location. Squares within the chronological assemblages are almost completely spatially discrete with only 10 squares overlapping, suggesting strongly that the surface layer of the site has been artificially divided between them. The surface spits, in effect, have an occupational use spanning from the early twentieth century to the present that cannot be meaningfully divided. They date to either ca 1919 or ca 1938 depending on the amount of post 1930 activity which occurred within their area.

Chronological Assemblages

The above exercises resulted in four assemblages (Fig. 7.8) with sequential means of 1881, 1888, 1903, and 1932. The time span each assemblage represents should lie more or less between the earliest date at which the production of any of the

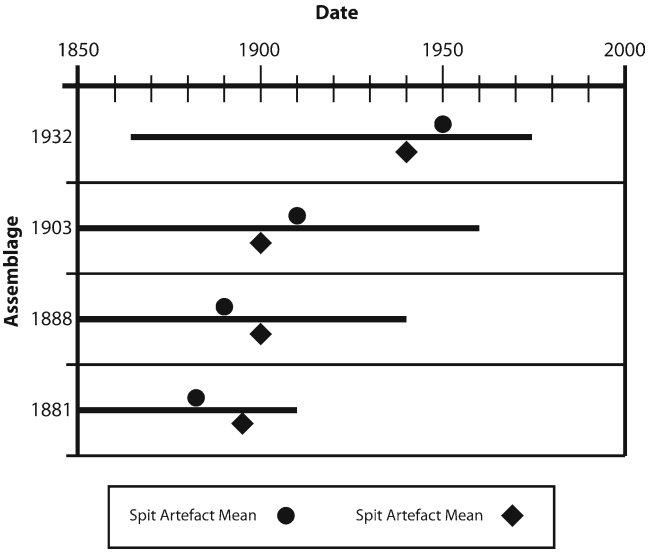

Fig. 7.8 Chronological assemblages

individual artifacts ceased (here called the "earliest *terminus ante quem*") and the latest date at which the production of any of the individual artifacts began (here called the "latest *terminus post quem*"). The start of the range is harder to fix, given the variable lag between manufacture and deposition date, but certainly occupation must have continued until at least the latest *terminus post quem*. Median dates of the included artifacts are also useful to consider, as they should cluster at the chronological assemblage's mean or, if not, an appropriate explanation should be available.

The median dates for the bulk of the "1881 assemblage" lie between 1870 and 1890. The earliest *terminus ante quem* for artifacts within the assemblage is 1874 while the latest *terminus post quem* is 1880; the occupation layer must span these dates but is unlikely to extend a great deal further in either direction or other *terminus* dates would be included. The suggested occupation period represented by the layer is therefore ca 1874–1880.

The median dates for the bulk of the "1888 assemblage" lie between 1870 and 1900. The earliest *terminus ante quem* is 1884 and the latest *terminus post quem* is 1895, suggesting an 1884–1895 occupation.

The "1903 assemblage" shows two clusters of medians, the main one lying between 1870 and 1900 with a smaller cluster between 1930 and 1944. Unlike the lower assemblages, the mean does not fall within a median cluster but just later than the range of the main cluster. This is interpreted as showing the effects of new technology introduced between ca 1890 and 1910 which is still in use today. The two obvious surges in 1935 and 1944 are, respectively caused almost solely by crown seal bottle caps available since 1892, and automatically made bottles available in greatest numbers since 1910. The bulk of dateable artifacts however, have their median date between 1870 and 1900. A mere four artifacts within the

assemblage have *termini ante quem* falling between 1880 and 1890, but the earliest for the other artifacts is 1895. The latest *terminus post quem* is 1910, suggesting a range of ca 1895–1910 with the possibility of some minor overlap with the lower assemblages, especially in squares where the basal spit above sterile has been assigned to the "1903 assemblage."

The surface "1932" assemblage also shows two clusters of medians partly for the same reason and partly because the assemblage covers a long occupational time span, suggested to be ca 1900 to present. Three artifacts within the assemblage have *termini ante quem* falling between 1880 and 1895, but the earliest for the other artifacts is 1900. As the assemblage is from the surface of the site it contains a range of modern artifacts which have been deposited after permanent occupation of the site ceased. The latest *terminus post quem* of 1980 belongs to two NATO blanks found close together within the excavated area. These blanks are the result of army exercises carried out within the abandoned town site. Artifact median dates cluster from 1932 to 1958 and mainly represent artifacts not available until after the turn of the century (except crown seal bottle caps available from 1892).

The long time span covered by the surface assemblage can only be meaningfully divided where a spit dating to the 1920s underlies one dating to the 1930s. This only occurs in 10 squares giving a less satisfactory data base for statistical analysis. However, comparing the subassemblages from these ten stratigraphically confirmed squares to each other and the overall "1932 assemblage" showed some interesting similarities and differences. The means for the two subassemblages were 1911 and 1937. The median date ranges for the "1932" and the "1937" subassemblage are quite similar although the median date range of the "1937" spits has lost the extreme ends of variation being 1862–1969 rather than 1850–1985. The assemblage mean date is later and a greater percentage (44.8% as opposed to 32.5%) of artifacts have a *terminus post quem* of 1930 or later, while a lesser percentage have a *terminus ante quem* of less than 1920 (4% as opposed to 7.3%). All of these trends suggest that the "1937 sub assemblage" has been refined by the removal of turn of the century "noise."

The real difference, as might be expected, lies between the "1932 assemblage" and the "1911 sub assemblage." The 1911 sub assemblage contains 213 artifacts of which 79 were dateable artifacts, a higher percentage (11.4%) had *termini ante quem* of less than 1920, and 11 artifacts (13.9%) have *termini post quem* of 1930 or later. All 11 of these artifacts fall into the intrusive category of artifacts as defined for lower assemblages. Following the method devised for the lower chronological assemblages these 11 artifacts were excluded from the dating analysis leaving a median date range of 1870–1952. The artifact median dates spread from 1870 to 1920 but centers on the 1890s with two prominent spikes at 1935 and 1944, respectively representing crown bottle seals and automatic glass. The earliest *terminus ante quem* is 1900 while the latest *terminus post quem* is 1925 suggesting dates for these 10 squares of ca 1900–1925.

In sum, the adapted mean analysis gives three layers during the nineteenth century with very little chronological overlap, a mixed twentieth century layer and a partial layer of 10 squares dating to the first quarter of the twentieth century. The artifacts used for the spit mean calculations were pooled and the assemblage mean calculated. Date ranges and assemblage artifact mean dates are shown in (Fig. 7.9).

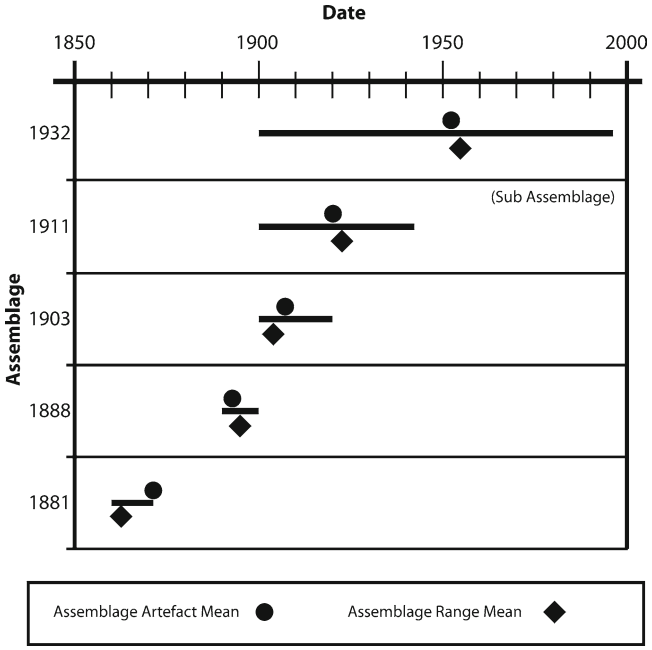

Fig. 7.9 Refined means and date ranges for assemblages

Stratigraphic Testing of the Dated Assemblages

The suggested dates are based on artifact date ranges that might be affected by factors such as distance from market, slow technological change, curation or reuse. Curation or reuse would have the effect of placing some of the artifacts in an assemblage which postdates the artifacts median date, or indeed its *terminus ante quem*. All the assemblages were analyzed to determine if any trends were apparent. Very few artifact types used in the mean analysis have medians noticeably older than the mean of the assemblage within which the artifact type's fall. There was little discernable pattern of curated types except possibly for ceramics, where four decorative styles had median dates older than the assemblages within which examples were found. These are, romantic period transfer prints, flow blue ware, second period ironstone, and transfer prints decorated with the cut sponge technique. While Miller's CC Index ends in 1870 (Miller 1991) and so does not cover the period of Cossack's occupation, these decorative styles were available during the period of his analysis and except for the cut sponge decoration, are shown to be more expensive wares in America. Therefore, there may be some curation involving mainly more expensive ceramic types although Brooks (2005) warns the relative costs cataloged in Miller's index is not as applicable to Australian sites as it is to American sites.

Bottle reuse does not show up within the dating, but the ca 1920 *terminus ante quem* for most nineteenth century bottle types gives a long time range which may mask any affect reuse may be having on the assemblage. However, historical information suggests that formal methods of bottle reuse such as returning bottles for money was not available in the northwest where there were no bottling factories. The possible exception to this is soft drink bottles as soft drink manufacturers did exist in the northwest in the latter part of the study period. This does not preclude a percentage of bottles being reused for other functions within the home which may affect dating.

The combined effects of distance from market, slow technological change, curation, reuse, or limitations relating to the dating method used, might be expected to produce slight inaccuracies in the dating of occupation periods. An advantage of working on an historical site is that dates for archaeologically registered events can be derived independently from the historical record and compared against dating derived from the assemblages.

The Knight and Shenton store site has five useful dates, one of which is not a year but a short time period.

- The original store building was built in 1870 marking the start of site occupation.
- Between 1872 and 1886, the store was expanded and a detached kitchen added.
- In 1941, the Japanese bombed Pearl Harbor resulting in the Japanese inhabitants of the store site being interned. This was the last time the building was inhabited
- In 1979 the building was pulled down and burnt.

The fifth date is associated with cyclone damage to the site. In 1898 a severe cyclone devastated the town and the storm-driven water surge associated with the cyclone lifted a large coastal steamer and left it on top of the stone wharf only 80 m south of the buildings front door. The storm surge also stranded a pearling lugger to the west and behind the Weld Hotel. The hotel is situated on the same sandy ridge as the Knight and Shenton store site and there is little doubt that on this one occasion the storm surge may have been powerful enough to wash over the store site.

This is supported by archaeological evidence from the excavation. There is a steep drop of 1 m from the house and kitchen on the northeastern side, which is partly stabilized by a retaining wall. All artifacts from that side of the site are relatively modern, and the artifacts from between the house and the retaining wall all date to the twentieth century except for those in the lowest layer. Within this lowest layer, artifacts are confined to small pockets along the wall, a very typical water-related pattern. The wall of the house appears to have been breached by flood waters at one point dislodging stones and depositing a thick layer of beach shells within the under floor space. The wooden post adjunct to the shells has the distinction of being the only house wall post which has not been reduced to a dark organic stain in the sand, suggesting that it is a replacement post. Both end posts of this wall have also been replaced, using concrete and kerosene tin moulds. The 1898 cyclone, as the only cyclone recorded with such a high storm surge from this turn of the century time period, is almost certainly the cause of these changes.

The important dates therefore are 1870, ca 1872–1886 for the kitchen and extensions, 1898, 1941, and 1979. The last two dates are within the surface assemblage which cannot be satisfactorily divided into short time periods however, the mean dating of the assemblage suggests the last period of occupation was ca 1940, the dating produced in the area of the galvanized shed.

The lowest assemblage is dated by *termini post/ante quem* from 1873 to 1881, giving a first occupation date which is 3 years later than the first known occupation. The earliest dates in the kitchen area (1884 and 1888) postdate the earliest dates south of the kitchen and suggest the kitchen was built in the mid-1880s. The dates however, offer a confusing picture with regards to determining first occupation. With two 1884 dates from the northern edge of the north/south trench which are not echoed in the rest of the trench which has a basal layer dated to 1888, which overlies the older dating in the most northern square. This suggests that the 1884 dates come from localized activity to the north of the site that predates the building of the kitchen. If this interpretation is correct than the first kitchen dates are 2 years later than the 1886 plan showing the kitchen built (Fig. 6.1). The removal of the eastern part of the site by the 1898 cyclone gives, in effect, a different first occupation date to that part of the site. The first pooled date in the affected area, dates the little pockets of artifacts not washed away by the cyclone to ca 1887, the next pooled date is 1902 which is 4 years after the cyclone.

This comparison suggests strongly that the dating method consistently gives dates slightly later, but to within 4 years of the historical dates. This finding has been echoed at other Western Australian sites (Table 7.1) with the mean of the artifacts associated with the Rottnest Salt Store toilets being 1913, the date the toilets were built (Nayton 1998b). The first occupation of cells in Fremantle Prison built in 1858 was mean dated to 1860 (Nayton 1998c) but the first occupation layer at Point King Lighthouse also built in 1858 had a mean date of 1866 (Nayton 1998a). This last date came from a 50 by 50-cm excavation and was therefore unavoidably affected by small sample size.

The dating method also appears to consistently give relatively short time periods (Table 7.1) although with such close dating some problems and slight date reversals are noticeable, particularly when only small sample sizes are available.

Examples shown are the floors in the Salt Store toilets being dated to 1913 and 1918, respectively (Nayton 1998b). The layers within the Fremantle prison cells are dated to 1860, 1870, 1883 and 1860, 1875, 1885, respectively with a layer after the two cells had been joined dating to 1904 (Nayton 1998c) which is close to, but earlier than the 1911 date for this improvement. As the walls were simply knocked down and the rubble dropped below the floorboards, older materials are likely to have become mixed in this layer, particularly older construction materials, adversely altering the mean date.

At Point King Lighthouse, despite the small excavation, dates from the 1860s, 1870s, and 1880s were recovered in stratigraphic order with an undateable construction layer underneath them (Nayton 1998a). At Cossack a small 50 by 50 cm clearance excavation produced three layers mean dating respectively to 1889, 1880, and 1882 (Nayton 2002). The dating is very close over a short time period indicating

Table 7.1 Comparison dating of other sites

Site	Layers	Mean dates	Historical dates/comments
Salt store: toilet	Top of floorboards	1918	1913–1929: use of toilets
	Under floorboards	1913	1913: toilet construction
	Under joists	1904	1913–1929: post office adjacent
			1868–1913: salt store adjacent
Point King lighthouse	TP5 chalk layer under upper floorboards	1884	–
	TP5 spit 1 chalk layer	1886	–
	TP5 spit 2 organic: top lower floorboards	1881	–
	TP5 spit 3 organic: below floorboards	1882	–
	TP5 spit 4 shell layer	1879	–
	TP5 spit 5 shell layer	1862	–
	TP5 spit 6 loose rocks	1866	On 3 artifacts
	TP5 spit 7 loose rocks	Undateable construction material	1858: lighthouse construction
Fremantle prison cell	Cell A20A pockets maintenance disturbance	1973	–
	2	1883	–
	3	1870	–
	4	1860	First occupation 1855
	Cell A20B pockets maintenance disturbance	1978	–
	2	1885	–
	3	1875	–
	4	1860	First occupation 1855
	Combined cells: 1	1904	Cells combined 1911
Cossack walk	Lot132: spit 1	1889	Artifact range 1880–1920
Cossack walk	Lot132: spit 2	1880	Artifact range 1880–1911
	Lot132: spit 3	1882	Artifact range 1875–1914
Lee Hop's garden	Ash	1920	Artifact range 1870–1915
	Garden	1905	Artifact range 1820–1925
Hangman's yard	Unit 2	1886 non construction	1872/1873–1960 yard
	Unit 6	1867 non construction	1851–1872 yard

(continued)

Table 7.1 (continued)

Site	Layers	Mean dates	Historical dates/comments
Old Port Arthur Head	Trench 4: unit 2	1941	Artifact range 1910–1980
	Trench 4: unit 3	Undateable	–
	Trench 4: unit 4	1897	Artifact range 1870–1950
	Trench 4: unit 5	1889	Rail bed artifact range 1870–1920
	Trench 4: unit 6	1894	Rail bed base artifact range 1870–1920 on smaller sample
	Trench 4: unit 7	>1870	On 1 artifact
Mandurah police barracks	Subsoil	1974	1880-present
	Grey soil	1913	1910-present
	Brown soil	1885	Artifact range 1829–1920
	Brown gravel	1883	Artifact range 1829–1920
	Dark with mortar	1869	Artifact range 1829–1920
	Limestone rubble	1867	Artifact range 1829–1920

a site used in the 1880s and early 1890s but the slight reversal of dates for spits two and three demonstrate the problems which can occur with small sample size.

The method was also used to date two occupation layers under layers of fill associated with Lee Hop's market garden (Nayton 2000) and to date nonconstruction materials from two yards found under the current yard surface in the Hangman's Yard at Albany Gaol (Nayton 2005). The Gaol was constructed in 1851 and the lower mean date of 1867 is associated with activities after the place was in use but the Hangman's Yard was not surfaced until 1872/1873. This semipermeable surface then lasted for the rest of the life of the prison. Construction of the current yard surface has impacted on this historic surface removing the top layer which is reflected both in the artifact date range and the mean occupation date of 1886. The method was also used to date a rail bed at the old Fremantle port to the last phase of port construction in the 1890s (Nayton 2008). Recently, the method untangled a complicated sequence of layers associated with the construction, use and demolition of the 1854 Mandurah Police Barracks (Nayton 2009a, b). The method gave reliable dates on sufficient artifacts to date major layers from the 1970s park surface, the 1917 park construction, the 1880s use of the site as a school and school teacher's house, and the 1860s use of the place as police barracks.

The dating method therefore gives a satisfactory degree of accuracy for most research purposes. For colonization research on this particular site the method divides the site into workable layers. The initial colonization period of the 1870s can be separated from the boom period of the Cossack based pearling industry. Both can also be separated from the later period of decline within Cossack based pearling and with it the fortunes of the town. The start of the gold rush in 1887 cannot however be distinguished from the pearling boom times as they chronologically overlap.

Chapter 8
Household Analysis: Site Layout and Building Design

Household Analysis

The previous chapters have highlighted many interesting questions which can only be answered by archaeological investigation at the excavation level. These include questions about adaption to environmental conditions such as how did Cossack residents try to cope with extreme heat, cyclonic winds, and tidal surges within their building design and layout?

Questions about the facilitation of trade: Did the facilitation of trade include facilitating imports as well as exports? How integrated with the British trading networks were the households of the northwest?

Questions about social relations and the expression of domination and resistance in the built environment and material culture of households: Can the effect of early regional elite resistance and then the collapse of that resistance be traced in the archaeological records left by households in Cossack? Was that resistance expressed differently by the pastoral, pearling, and urban elite of the northwest in their built environment and material culture? Were there differences in surplus accumulation between the regional development elite groups of the northwest? How is the domination of the urban and pearling elite expressed in the built environment and material culture of households in Cossack? How is resistance to local elite domination expressed in the built environment and material culture of Cossack households? How different was surplus accumulation in the households of the northwest to that of households in the southwest of the same period?

Not all these questions can be answered from one excavation site. Questions regarding the differing expression of status or surplus accumulation by different groups during the same time period obviously cannot be answered from one site. As an urban site, the store cannot answer questions regarding the rural pastoral elite or their workers. The site is also not situated in the pearling master's enclave, Chinatown or an Aboriginal fringe camp, so it cannot answer questions regarding pearling masters and their workers in the nineteenth century, but it is placed to look at this question after the successful spread of Asian resistance out of Chinatown in the twentieth century.

G. Nayton, *The Archaeology of Market Capitalism: A Western Australian Perspective*, Contributions To Global Historical Archaeology, DOI 10.1007/978-1-4419-8318-3_8,

The Knight & Shenton store site is better placed to answer questions regarding urban elites, trade, and adaptation. The history of site use at the excavation site can be summarized as:

- 1870–1872 Knight & Shenton store/partner's house
- 1872–1875 McRae & Co store/partner's house
- 1875–ca. 1883 McRae & Co store/Jnr. partner's accommodation
- Ca. 1883–1892 McRae & Co Jnr. partner's accommodation
- 1892–1907 W.D. Moore store managers (relative of owner) accommodation
- 1907–late 1920s Japanese laundry/laundry workers accommodation
- Late 1920s–1941 accommodation for Japanese divers

The dating method used in Chapter 7 has enabled the division of the excavated material from the store site into four main chronological assemblages with the last assemblage capable of being subdivided into two sub assemblages. The date ranges for these assemblages can be generally matched to the store occupation thusly:

1870–1882: Regional development elite store/partner's house
1884–1894: Regional development elite accommodation
1895–1910: Regional dependency elite accommodation
1900–1925: Urban ethnic primary producer
1920–1941: Pearling ethnic primary producer

These divisions and occupations demonstrate some interesting matches, but it is clear that any interpretation of change over time within the assemblages will need to take into account the differing social situations of the site occupants.

1870–1882

Site Layout and Building Design

The archaeological excavation uncovered the stumps of the original store building (Fig. 8.1). They were quite distinctive, being large jarrah timbers averaging 33 cm^2 by over 1 m in length. Judging from the average depth of the lowest layer of artifacts, the top 35 cm of the stumps appear to have been above original ground level to the southeast of the building with the ground level to the northwest dropping so they were 60 cm above the ground.

The house probably had 14 original stumps of which 12 remain. One of the large corner stumps is missing as is a smaller verandah stump. The location of the stumps suggests a building 4×4 m with a front verandah of 1 m width facing Pearl Street to the northeast. This original building became a room or rooms within a later larger building.

The artifacts found under and immediately around the original store site were excavated in 1979 by Peter Board, a local bottle collector acting briefly in the capacity of amateur archaeologist for a local heritage interest group. The majority

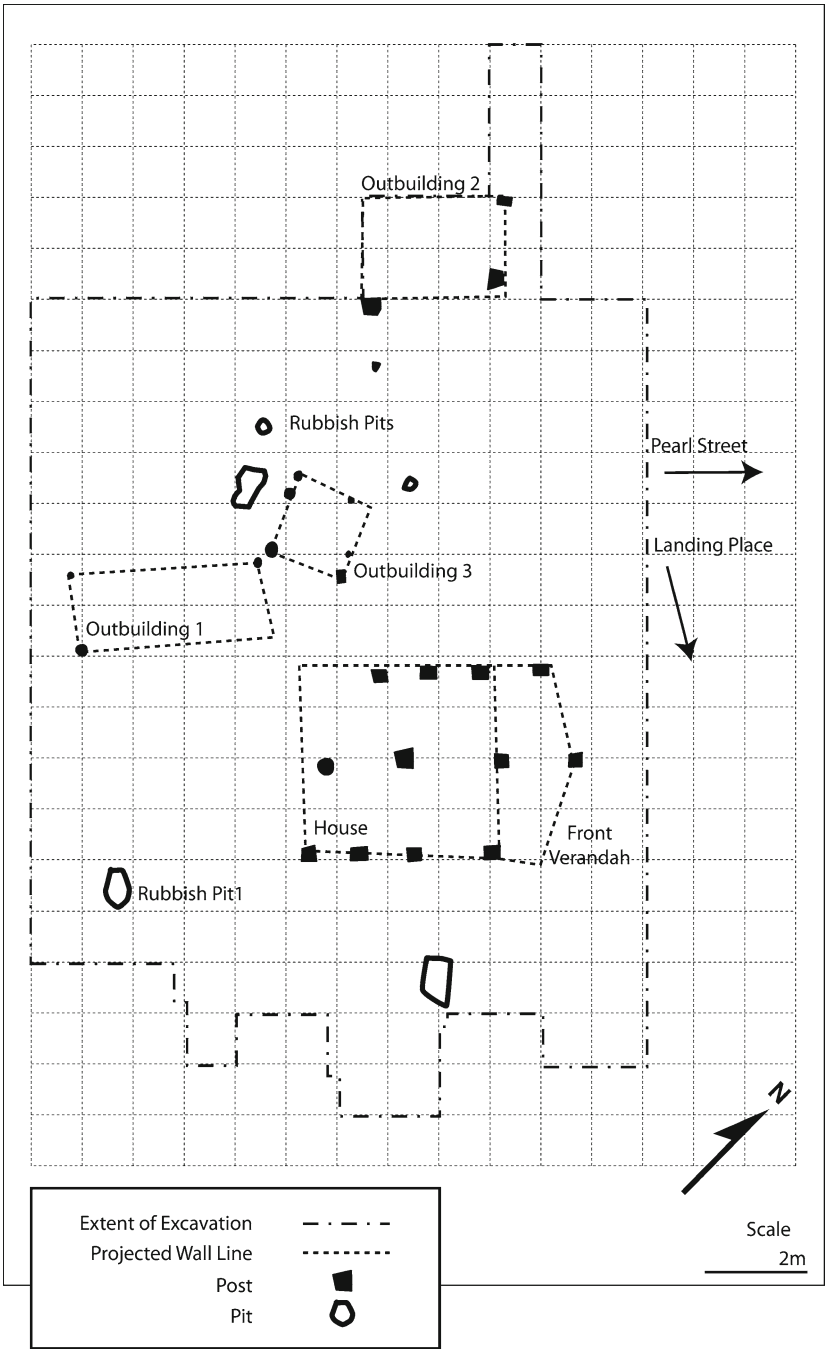

Fig. 8.1 1870–1882 Site plan

of the artifact collection was given to the town caretaker and later lost with only the coins retained by Peter Board being recorded. The spread of building-related artifacts and features associated with the 1870–1882 database demonstrates the extent of the impact of the earlier excavation on this database (Fig. 8.2) with building-related artifacts clearly not associated with the main structure but to its outbuildings.

There is architectural evidence for three small outbuildings or structures with historic photographic evidence of a fourth larger building to the south of the main building. Outbuildings 1 and 3 were constructed with jarrah posts suggesting they may have been built at the same time as the main building. There is also archaeological evidence from the spread of building artifacts to suggest the location of a fifth structure or building activity area to the northwest of the building that has left no in situ architectural evidence.

Outbuilding 1 was located to the west and behind the main building. It was approximately 3.5 m long by 1.5 m wide and lightly built. Jarrah posts in the corners of the structure, of which three were excavated, appear to have formed a frame over which cladding was tacked. Almost half the nails connected with this structure are tacks or clouts associated with attaching cladding. Two fragments of corrugated iron and an iron strap suggest this may have been the cladding material. Other building material was mainly stone used to wedge the posts firmly into the postholes.

The outbuilding was not the site of dense activity and that which occurred was mainly food related (Fig. 8.3). The bulk of the artifacts are from the kitchen and activities groups with the activity group selectively consisting of food-related items and shells (however, the shells in this database are mainly unidentifiable small shards thought to be from the beach sand matrix rather than human usage). Other artifacts associated with the outbuilding include fragments of meat safe, a brass rivet, and a brass facing which may have been from with the same object. The presence of the meat safe and the low artifact density suggests a food storage area rather than a food preparation or consumption area. However the higher proportion of drinking related to food-related artifacts suggests some drinking may have occurred within the yard behind the main building.

Outbuilding 2 was located to the northwest of the main building in the area of the later kitchen. The remains of three posts associated with it were excavated. Unlike the posts of outbuildings 1 and 3 and the stumps of the main building, these posts had decomposed in situ suggesting they were not jarrah, which is a particularly hardy and termite resistant wood. The three posts are tentatively interpreted as corner posts, giving a structure approximately 2.5 by 2 m, as there was no other evidence for posts in either the northwest-southeast or northeast-southwest sections. It is possible however that the building extended for a further 2 m to the northwest. Given the distance between the existing posts, the next would have fallen within square s22w2 where an anthill would have destroyed any evidence for a post with any further posts falling outside the excavated area. Building-related artifacts suggest the building may have been clad in timber rather than in corrugated iron as the majority of nails associated with it are not tacks and clouts but wood nails with

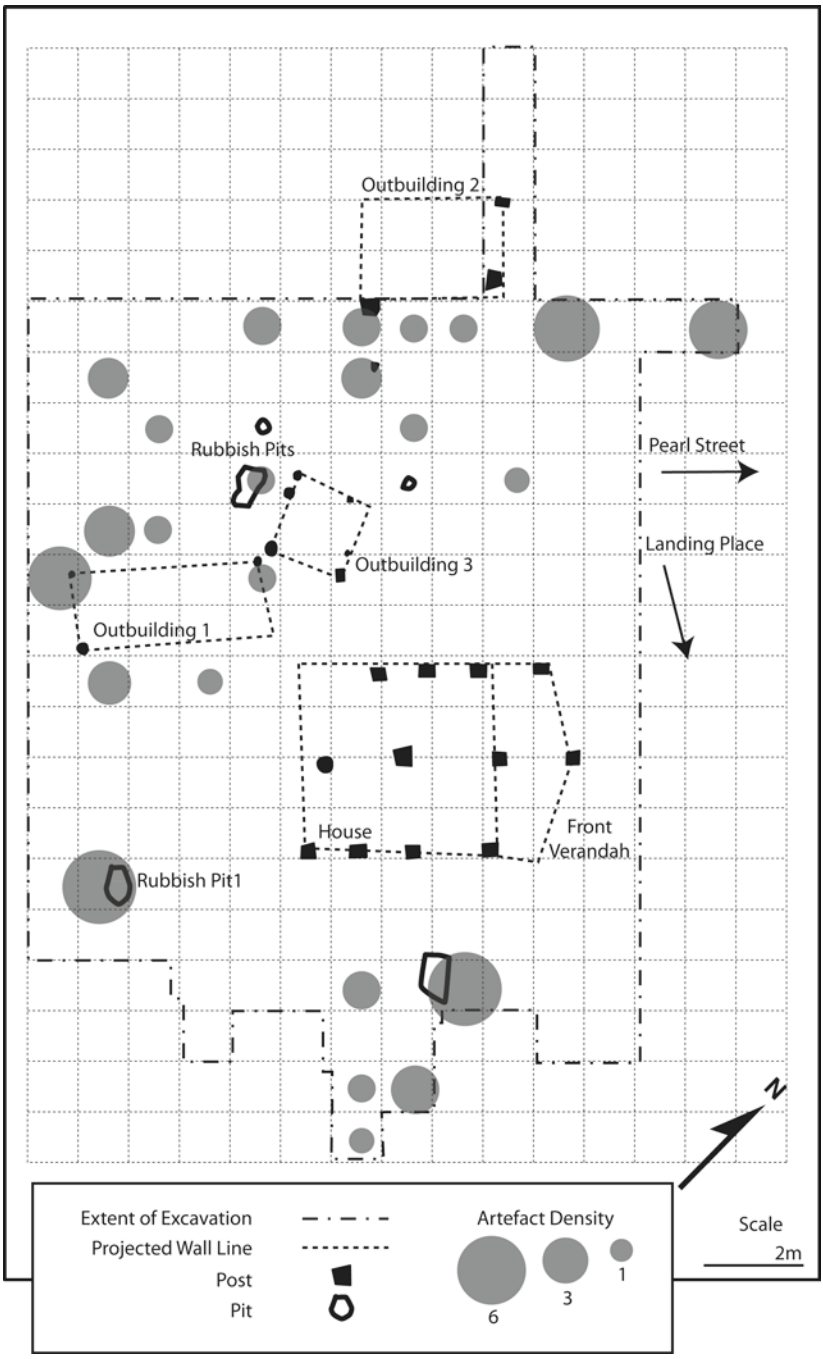

Fig. 8.2 Spread of architectural group artifacts in the 1870–1882 database

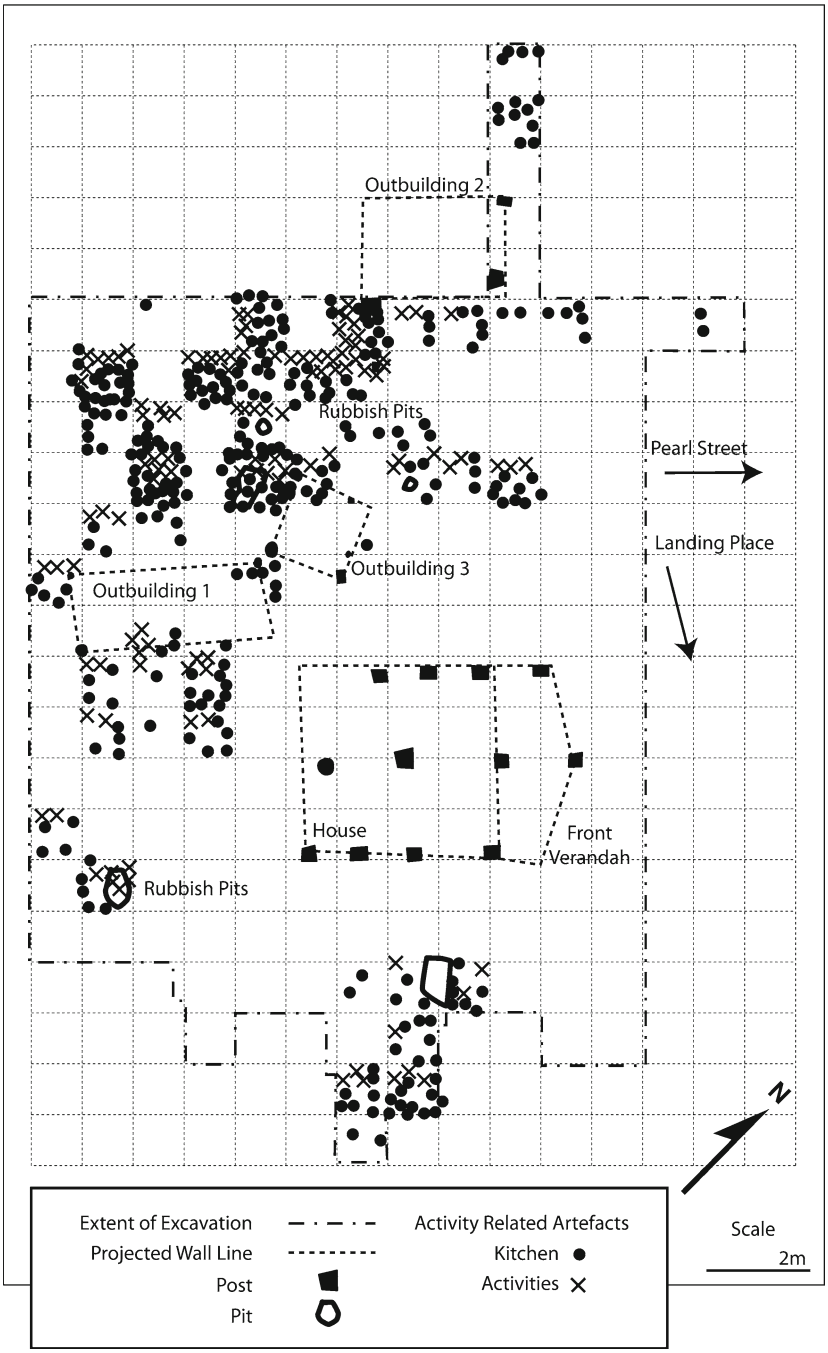

Fig. 8.3 Spread of kitchen and activity group artifacts in the 1870–1882 database

some roofing nails. Window glass 2 mm thick and shards of window putty were found in squares s26w4 and 5w indicating the presence of a window in the southeastern corner of the building. Window glass 1.5 mm thick, putty, and an iron eyelet for holding curtain wire were found to the east of the building indicating the location of a second window in the northeast façade facing Pearl Street.

Square s26w5 is different from other squares associated with the building, being more typical in the type and spread of artifacts to the clustering of material in the backyard between the outbuildings. If this square and sewing pins, which have been shown to be intrusive over much of the site, are removed from consideration, the structure is not heavily associated with food (8% of nonarchitectural material in squares s26w1 to s26w4) or kitchen-related artifacts such as Jars (4%) and has no ceramics, kitchenware, or storage containers. This does not suggest a food preparation or storage function. The highest percent of the remaining 26 artifacts are associated with drinking (bottle and lead seals = 46%) and clothing (buttons and clothing hardware = 15%). Eleven percent of the sub assemblage is made up of tobacco pipes while bullets make up 8%, writing 4%, and pharmaceutical bottle 4%. These artifacts suggest the presence of a person or persons but offer no conclusive evidence for the building use. The presence of a slate pencil and a shard of linoleum suggests that the structure may have had an office function, but it may have also been a room used mainly as a place to sleep.

The small structure, approximately 1.25 by 1.25 m, labeled outbuilding 3 has seven small posts associated with it but has only one full spit of associated artifacts in the database, that from s29w6. Therefore, it is difficult to say much about the building materials or activities associated with the structure. However, fragments of sheet iron were recovered from s29w6 suggesting the feature is possibly the remains of a small structure of jarrah poles and sheet iron cladding. The small size suggests possibly a toilet, but it would not have been a "bush" toilet, which is basically a toilet seat over a hole in the ground. If this structure was a toilet, it was a bucket toilet with the sewerage taken and buried further from the occupation area.

While it is difficult to say if outbuilding 3 had an activity area around it, there is a definite area of activity in the yard between all three outbuildings. The spread of building and food-related artifacts (Figs. 8.2 and 8.3) within the excavated portion of the yard to the northwest of the main building suggests two focal areas. Outbuilding 2 and a focal point in the middle of the yard (s28-29w7-9) which has left no building-related features such as posts but has a high percentage of tacks and clouts associated with it. This suggests it was a lightly built clad structure or feature; however, the cladding may not have been iron sheet but canvas or hessian stretched over a structure, which does not appear to have been embedded into the ground. This could be something more like a tent, wind break, or shade structure.

This structure or feature and the general area around it had a heavy concentration of food-related artifacts and a fairly even scatter of clothing and personal items. Densities of food-related artifacts are particularly high in s27-29w9-10 to the west of the possible structure. Ceramics consist of storage canisters as well as tableware such as cups and plates with the high concentration of food items indicating a dining area or possibly a kitchen. There is also a high density of such items immediately

to the southwest of outbuilding 2 suggesting an activity area to the west of the building that is also related to food preparation or consumption.

Outbuildings 1 and 3 suggest that the original store was built of a mixture of wrought and wire nails. Outbuilding 1 has 9 nail types almost evenly split between wrought and wire types, and outbuilding 3 has 11 of which 8 are wrought nail types with 1 old wire nail type having the older thicker shaft design.

Outbuilding 2 which is built of a different type of timber has a much greater variety of nail types (27) used with none of the types being a dominate type. Given the differences between this building and the other buildings on the site, it is likely that it was not built as part of the original construction works in 1870. The nails types used, however, are also almost evenly split between wrought and wire types with some wire nails types having the older thicker shafts suggesting that it was an early 1870s building. Given these strands of evidence, the structure is likely to have been built as part of upgrades carried out by McRae & Co after they took over the site in 1872.

An historic photograph taken in the early 1880s (Fig. 6.5) and a rare 1886 town plan showing building locations (Fig. 6.1) place a large outbuilding to the southeast of the main building closer to the inlet. Analysis of artifacts removed from 7 m^2 excavated on the southeastern side of the house wall near the estimated location of this structure supports an identification of this building as the warehouse for the McRae & Co general store.

The area excavated in this part of the site was 13.7% of the total excavated area of the 1870–1882 database. Therefore on an ideal plain it would contain roughly 13.7% of the artifact database and roughly the same percentage of artifact groups and classes. Table 8.1 shows that the area contained 13.4% of artifacts from this period, only slightly less than the ideal amount indicating this was not an area of significantly less site activity. However, the percentage of artifact groups varied widely from the architectural and kitchen groups which have percentages very close to that of the group within the total assemblage to the furniture, clothing, and tobacco pipes groups which all have significantly higher representation in this area than in the assemblage as a whole. The activities group has a significantly lower representation, and the small arms group is missing entirely.

A closer look at the artifact classes represented in the area show that the total database has 35 of the 48 artifact classes present at the Knight & Shenton Store site. Of these 35 classes, the S/E excavation has 20. Missing is one architectural class, two personal classes, four of the numerous kitchen classes, and five of the much less numerous activity classes. The activities group present in this area consists entirely of mammal bone from the food class. Other than this evidence of food, the area contains no opened cans, items of kitchenware or pharmaceutical type bottles and a low percentage of bottles, ceramics, and drinking glasses. It did, however, contain half the total amount of the smaller classes of medicine other (represented by ointment jars), glass tableware, clothing, and a high representation of tobacco pipes and toys. It contained almost a quarter of the toys associated with this time period with toys totaling half of the personal items from this area. Given that the site during this period was occupied by unmarried men, the toys are unlikely to be from the domestic occupation.

Table 8.1 1870–1882 Artifact percentages within southeast yard

Total 1870–1882		Total S/E excavation		S/E percentage of total	
1,100		13.7%		13.4%	
Group	S/E % of artifact	% S/E assemblage	Total % assemblage artifacts	Total % of assemblage	S/E % of total
Architectural	54	36.5	386	36.2	13.9
Furniture	6	4	20	2	30
Kitchen	43	29	306	28.7	14
Clothing	10	6.7	45	4.2	22
Personal	8	5.4	38	3.6	21
Activities	11	7.4	233	21.8	4.7
Tobacco pipes	16	11	33	3	48
Arms	0	0	6	0.5	0
Clothing classes					
Buttons	6	–	35	–	17
Clothing	2	–	4	–	50
Furniture classes					
Furnishings	5	–	17	–	29.4
Ornaments	1	–	5	–	20
Kitchen classes					
Lead capsules	20	–	72	–	27.7
Ceramics	7	–	87	–	8
Glass tableware	2	–	4	–	50
Medicine other	3	–	6	–	50
Drinking glasses	3	–	31	–	9.6
Bottles	5	–	73	–	6.8
Jars	1	–	9	–	11
Glass stoppers	2	–	6	–	33
Activity classes					
Food	11	–	164	–	6.7
Personal classes					
Writing	3	–	20	–	15
Toys	5	–	13	–	38
Tobacco pipes					
Tobacco pipes	16	–	42	–	38
Architectural classes					
Window fittings	10	–	50	–	20
Building	13	–	49	–	26.5
Nails	31	–	286	–	10.8

The high number of tobacco pipes came mainly from one rubbish pit containing 10 of the 16 pipes found in this area of the site. Clay pipes dominate the collection from the rubbish pit which otherwise contained six lead bottle sealing capsules, five being the same type, a shard each of furnishings, drinking glass, and animal bone. None of the clay pipes had indications of use, and the rubbish pit contents are interpreted as being a cache of broken store goods. Except for the mammal bone, the

artifact classes within this whole area are more consistent with store goods than a domestic occupation, particularly domestic occupation by unmarried men, and are interpreted as items lost or broken in transit between the warehouse and the store.

The evidence left of the early store and outbuildings does not show any particular adaptations to extreme heat. The building is orientated to Pearl Street with a small front porch on the northeastern side, which would have offered patrons some protection from the morning sun as they entered the store but would have provided little extra protection to prevent heat build-up within the structure. The store site is located in the far distance of in Fig. 6.5, when this area is enlarged the structure is shown to have high-pitched roof and a central rear door (Fig. 6.7). The location of the two doors may have allowed a breezeway through the structure, but it was not orientated to catch the sea breeze off the inlet. The concentration of store goods on the inlet side of the building could suggest a door facing the warehouse; however, as the warehouse was built after the store the evidence is more likely to represent a well-used path from the warehouse around the building to the front door.

The main structure does indicate some thought to other site conditions. The structure was build of jarrah timber, which is resistant to termites and to cyclones washing mud mortar or mud bricks away. By the time it was built, the colonists had been in the northwest for 7 years and the presence of termites would have been noted. The colonists were familiar with the properties of the southwest jarrah timber, which is a hard timber resistant to both termites and rot. They had been exporting it since 1836 and by 1870 most timber houses in Perth would have been built with a jarrah frame and weatherboards. Building in jarrah is not then a deviation to southwest practices; however, the building of the store with jarrah is different enough from early northwest practices to be remarked upon (Inquirer 15 May 1872).

The choice of jarrah may have derived purely from economic considerations; the predominant timber at Cossack in 1870 would have been mangrove trees, which are not tall straight trees producing good structural timbers. The cost and difficulty of cutting and carting structural timbers across the mangrove swamps from Pilbara river courses may have made the cost of shipping jarrah to the early port a more economic and practical action; but this action was not followed by other early Cossack builders who built in the light mangrove timbers. The choice, therefore, may have been influenced by the known hardiness of the timber and its resistance to termites or it could have been a social statement similar to the later building in stone by northwest elites. Although small, the Knight & Shenton store stood out as the first substantial building within the township, and this may have been the intention of the builder.

One or all of these factors may have influenced the choice of material. However once the material was in the northwest, the building was erected on the nearest high ground to the landing place, not at the landing place itself. This decision was not forced by lot ownership as town lots had not yet been laid out and it strongly suggests a degree of familiarity with the possible danger of storm surges. The small 4 by 4 m structure was also built on 14 large solid house posts sunk 40–60 cm into the sand. Such an emphasis on large solid strong foundations indicates an adaptation to prevent a structure built on a sand dune from blowing away during a northwest cyclone. An aim successfully achieved for 109 years.

The roof shown in Fig. 6.10 is relatively steeply pitched as are several other pre-1883 buildings shown in the same photograph indicating the Resident Magistrates suggestion to lower the roofs of houses (CSO 714:1871) was not generally followed at Cossack, not even by the government itself, which built the post office with a very steeply pitched high roof in 1882. In 1872 the roof was described as being made of shingles (CSO 714:1872), but by ca. 1882 the roof is made of large sheets of timber (Fig. 6.7), similar to several other pre-1882 roofs visible in Fig. 6.5.

The Knight & Shenton store therefore shows little adaptation to extreme heat, but some adaption to the dangers posed by cyclones in its building material choice, location, and structural design. The choice of building material and structural design is also suggestive of an expression of elite status and permanence, which stood out from the other flimsy structures within the town at the time.

1883–1895

Site Layout and Building Design

When originally built, the building functioned as both a store and a home for one of the partners. Archaeological and photographic evidence shows that a detached wooden kitchen with a stone chimney existed to the north of the store (Figs. 8.4 and 8.5). This building is not shown in the 1872 town plan (Fig. 4.1) but is shown on the 1886 town plan (Fig. 6.1) suggesting the kitchen was not part of the original Knight & Shenton store complex but had been added to the complex by 1886. The dates derived from the excavation trench across the kitchen (Fig. 7.2), and time lag analysis suggests a mid-1880s construction date for the kitchen indicating it was not built for Farquhar McRae as he moved out to a new home in the mid-1870s. The presence of the new kitchen indicates that someone else occupied the site after McRae moved out. McRae & Co were a group of partners so it is likely that another of the partners moved into the building to help service, what by the 1880s, would have been a very busy store. The most likely candidate for this would be Fred Pearse who joined with the original two partners sometime in the mid-1870s, possibly because Farquhar was having problems with his original partner who had a drinking problem (McRae 1868–1878: Letter August 31, 1877). Fred is noted as the store manager in 1886 by a visitor to the town (Flinders 1906).

There is only one known photograph from this period, which is taken from a ship moored at the jetty within the period 1887–1897, but the historic photograph can no longer be located in the Karratha Library or State Archives of Western Australia leaving a 20-year-old photocopy as the only record. The photocopy shows the stone chimney at the eastern end of the kitchen. The chimney is clearly perched on the end of the dune, and this may be the reason for the massive foundations, which extend both downward and outward for over a meter (Fig. 6.3). The style is again clearly colonial Georgian with no doors or windows visible in the eastern corner of the building. Archaeological excavation evidence suggests the presence of a doorway

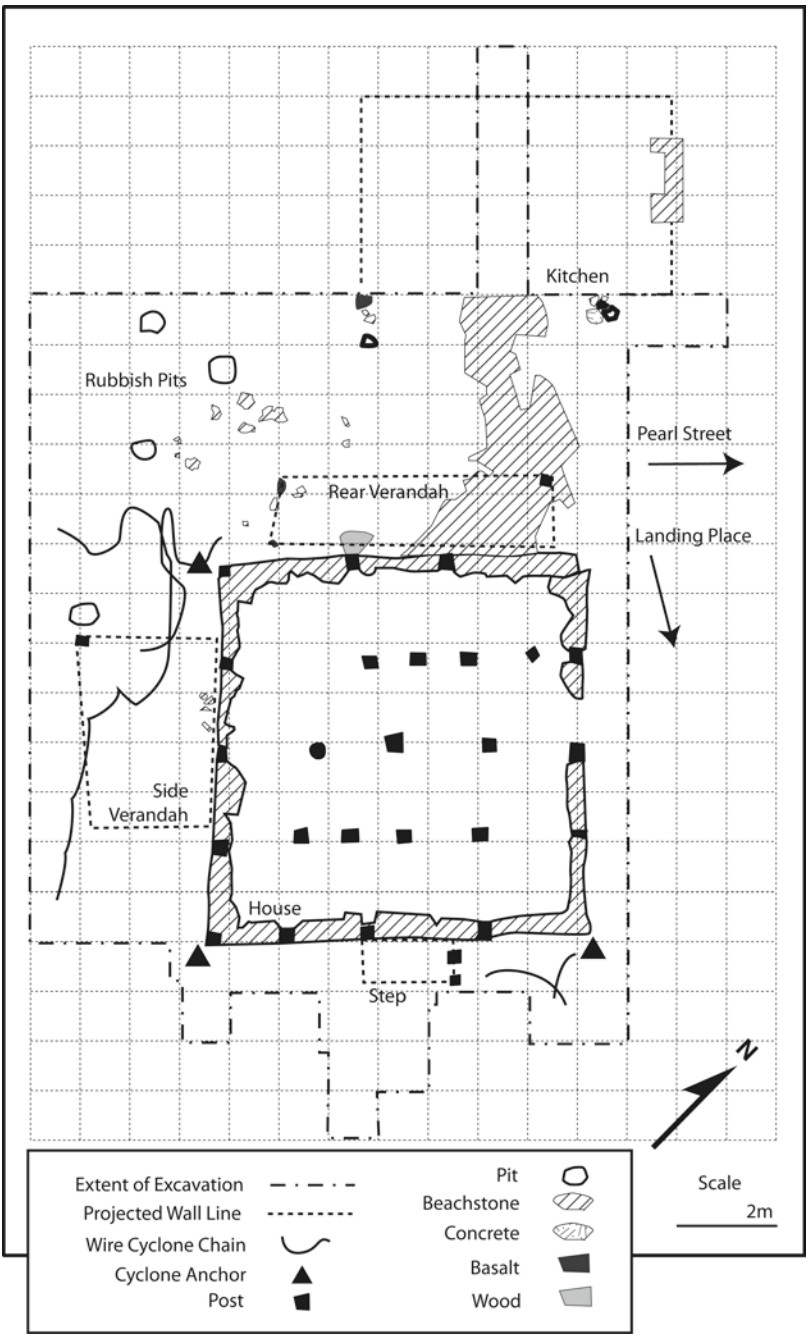

Fig. 8.4 1883–1887 Site plan

Fig. 8.5 The Knight & Shenton store site ca. 1906 6005B/6: Courtesy State Library of Western Australia, The Battye Library

Fig. 8.6 Detail of Fig. 8.5. 6005B/6: Courtesy State Library of Western Australia, The Battye Library

just out of sight of the photograph as a beachstone path is located between the main building and the kitchen (Fig. 8.4).

The roof shown in historical photographs is a simple hipped style and appears to be made of wooden shingles. It is distinctly different from other roofs around it, something that can be seen more clearly in the cropped close detail of Figs. 8.5 and 8.6. The photograph shows the northwestern side of the kitchen revealing a doorway and window in the northwestern wall and a window at the southwestern end of the structure. The location of the doorway taken with the archaeological evidence of the beachstone path and the chimney suggests that this small, 6×4 m building had a doorway on either side of the kitchen oven.

The location of the window shown in the historical photograph taken from the jetty was not excavated but window glass was found across most of the excavation

squares across and alongside the kitchen. Some of this material could have derived from the demolition of the 1870s outbuilding 2, which would have occurred prior to construction of the kitchen. All window glass not 1.5 or 2 mm thick was found as part of kitchen posthole features, suggesting the 2.6-mm window glass found at the location of the northwestern doorway and the louver glass found at the southern corner of the building were buried at the time of the construction of the kitchen. Neither type of glass was found in these areas within the 1870 to ca. 1881 database suggesting these types of glass replaced the windows broken and entering the earlier database. The majority of glass found outside of features was 2 mm thick and was located between s26w0 and s26e2, which suggests a second small window may also have been located beside the southeastern doorway just out of sight of both photographs.

The main building was also extended during the period of the 1882–1895 assemblage. An encircling verandah was built completely around the building extending it by 2 m on the northwestern, northeastern, and southeastern sides and by 1½ m on the southwestern side toward Pearl Street. The outside edge of the verandah was supported by square wooden posts (Fig. 8.4) set within a low 40 cm high drystone wall. The posts have decomposed suggesting they were not jarrah, and excavation proved that they did not extend below the foundations of the drystone wall. The top of the posts and wall form a level surface, but height from ground level varied from 40 to 55 cm with the height on the southwestern side, being greatest indicating the ground level was still lower on this side of the building during this period.

The historic photograph shows that roofing material for this extended roof had been changed to iron, probably corrugated iron, by the time the photograph was taken. This may have occurred when the building was extended. By the time the photograph was taken (1887–1897) the roof is battened down by cyclone anchors, but the archaeological evidence points clearly to this being a later adaptation. The seven cyclone anchors found on the site all relate to the later enlarged structure, not the original structure in the center. While evidence may have been removed by Peter Board's 1979 excavation, this is unlikely as a large concentration of metal would have been remarked on and noted in his site plan which noted the location of some specific artifacts such as coins and an intact plate.

With the addition of the encircling verandah, the orientation of the building was changed. Archaeological evidence of three decomposed wooden posts (Fig. 8.4) indicates the presence of a wooden step up to the center of the southeastern verandah suggesting an entrance at this point, facing the inlet and the rest of the McRae & Co complex on Lot 122. The historical photograph shows the verandah was open along the southeastern side of the building and enclosed along Pearl Street frontage with a boundary fence running alongside the building and extending down to the McRae & Co warehouse.

Further decomposed posts (Fig. 8.4) indicate that additional verandahs were added to both the northwestern (rear) and southwestern sides of the building showing that the encircling verandah was enclosed on these sides as well forming a series of rooms around the original core of the building. The location of artifacts relating to doors suggests that these additional verandahs were also enclosed as door fittings

were found near the southern and northern corners of the southwestern side verandah and the western corner of the rear verandah. Those close to the northwestern corner of the building may have come from the demolition of outbuildings 1 and 3, which would have been necessary to build the verandahs, but the southern corner of the southwestern verandah is removed from the location of older structures and this explanation is unlikely for this area.

Three door-related artifacts were found in this area and two blue beads. Blue beads were popular in Cossack in the 1920s as door curtains to keep out flies (HM Wilson, 1991 personal communication). Of the ten beads found in the 1883–1895 database, six were blue beads and all were located in the same areas as door fittings or were located in the two locations site features (front step and beachstone path between kitchen and house) indicate were the main entrances to the 1880s house. This suggests blue bead door curtains were used in the 1880s and fitted to the front and rear house doors and that the rear and southwestern side additional verandahs were at least partly enclosed with doors at the southern corner of the side verandah and the western corner of the rear verandah.

Other features suggest neither of the additional verandahs was completely enclosed. The beachstone path to the kitchen accesses the house at the eastern end of the rear verandah while door-related evidence suggests a door was at the western end. The path would have run under an enclosed verandah with flooring at the same height as the main house. The path clearly coexisted with the rear verandah and would have been built as part of the major site upgrade, which added the kitchen and additional rooms to the site. Therefore, it is unlikely that this direct access route to the kitchen was blocked as soon, or shortly after, it was built, particularly when there is no evidence of another path leading to the kitchen from the western end of the verandah. It is therefore likely that only the western end of the additional verandah was enclosed creating a small room and that the rest of the additional verandah had a dirt floor with a step up required to enter the house.

There is a thin layer of gravel across the area under the southwestern additional side verandah, which extends past the verandah posts to a position level with the front of the 1880s house. The gravel indicates that an attempt was made to provide a firmer surface in this area. This would again suggest an open verandah with no flooring. The area also contains evidence of cultivation against the house wall. Thin wooden posts held upright by small rocks are grouped close to the southwestern enclosing wall circling sandy limestone tubes formed around plant roots long decayed. This evidence of gardening under the shade of the verandah and the attempt to provide firmer footing suggest the area was both outside and used for recreation.

The thin layer of gravel is covered and penetrated by an equally thin layer of charcoal. The verandah post located in square s36w8 has also been charred in situ. Mean dating for the burn feature is 1887, with a site time lag of ca. 4 years that suggests the verandah burnt down in the early to mid-1880s and was then rebuilt using the same posts (Fig. 8.7). It is likely that it was this second verandah which was enclosed at its southeastern end with a door which opened onto a small path running parallel to the house from the junction of square s34w10 and s35w10.

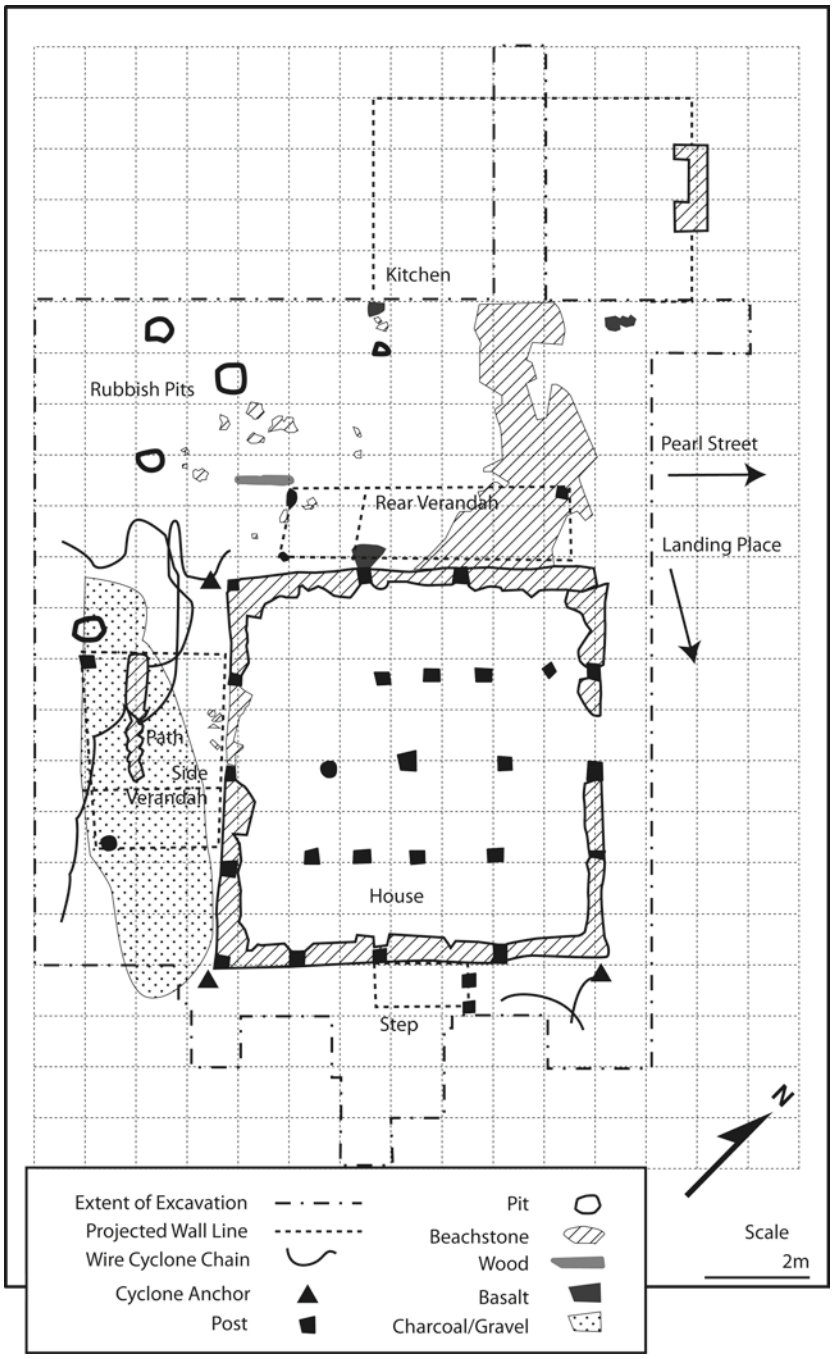

Fig. 8.7 1887–1895 Site plan

The position of door-related artifacts and the path suggest the area of verandah enclosed was quite small being approximately 1 × 2.5 m (Fig. 8.7).

For the first time, efforts to protect the roof from cyclones show up in the archaeological record. Cyclone chains were used to hold the roof down with the chains being anchored into the ground at each corner of the building by cyclone anchors.

To create the anchors, holes were dug into the sand and filled with heavy pieces of metal jumbled together to form a tight whole (Figs. 8.4 and 8.7). It appears any redundant heavy piece of metal was used including broken ship's anchors, cast iron store scales, bedsteads, and even rails from the tramway. The chains at the excavation site were steel cables. Those attached to the anchors when the house was demolished were 5 and 7 cm thick and appear to have held down the eastern and western edges of the roof rather than crossing the roof diagonally.

Three cyclone chain anchors with archaeological dates of 1882–1884 survive from this construction phase (Figs. 8.4 and 8.7). Given the time lag of up to 4 years identified in Chapter 7, this suggests either the cyclone anchors were added as part of the house extension just before buildings in the town were mapped in 1886 (Fig. 6.1) or the anchors were added between 1886 and 1888. The anchors are located at each corner of the extended house indicating a fourth anchor is likely to have also existed at the northern corner of the building which was subsequently washed away by the 1898 cyclone that devastated the town. Archaeologically, the anchor found in this location mean dates to ca. 1902 and sits within an area of early twentieth century layers overlying sterile sand held in place by a retaining wall.

It is quite likely that it was during the mid-1880s that the function of the building and site changed from store/domestic to just domestic with either the warehouse taking over the store function or one of the two new buildings situated toward the front of Lot 122 (Fig. 6.1) taking over as store. At the end of this period of site use, the building is known to have a purely domestic function being used after 1892 as the W. Moore store manager's residence after the McRae & Co complex was sold to this Fremantle-based merchant.

The ca. 1883–1895 database has 42 of the 48 artifact classes present at the Knight & Shenton Store site. Of these 42 classes, the southwestern side yard excavation has 35 (Table 8.2) indicating the area had a great variety of classes, missing only the small tool and travel classes from the activities group and five of the numerous kitchen classes.

The side yard covers an area of 14 m^2 within an excavated area for this time period of 71 m^2 making it 19.7% of the excavated area. It contains 765 or 27% of the excavated 2,829 artifacts for this period giving it a higher percentage of artifacts for the amount of excavated area then found within the total area (Table 8.2). At 43.1% architectural-related item are slightly higher than for the total assemblage, but this is likely to be an effect of the need to rebuild the additional side verandah after the ca. mid-1880s fire. Kitchen-related items are slightly lower than for the total area as are the clothing, personal, and arms groups but activities are higher.

While most of the kitchen classes are present, they are in smaller percentages than the percentage size of the area excavated except for bottles, drinking glasses,

Table 8.2 1883–1895 Artifact percentages in yard areas

Total 1883–1895	Total side yard		S/Y % of total square meter	S/Y % of total artifacts	B/Y % of total square meter	B/Y total artifacts	B/Y % of total artifacts
2,829	765		21.5	27	53.5	1,319	46.6
Groups	Total assemblage artifact numbers	Total assemblage %	S/Y artifact numbers	S/Y % of total group	% for S/Y assemblage	% Back yard artifacts	B/Y % of total group	% for B/Y assemblage
Architectural	1,102	39	330	30	43.1	408	37	31
Furniture	55	1.9	14	25	1.8	27	49	2
Kitchen	841	29.7	192	22.8	25	442	52.5	33.6
Clothing	142	5	24	17	3.2	69	48.6	5.3
Personal	115	4	26	22.6	3.5	57	49.5	4.3
Activities	493	17.4	161	32.6	21	274	55.5	20.7
Tobacco pipes	61	2.1	16	26.2	2.1	29	47.5	2.2
Arms	20	0.7	2	10	0.3	13	65	0.9
Classes	Total assemblage artifact numbers	Total assemblage %	S/Y artifact numbers	S/Y % of total class	% Class for S/Y assemblage	% Back yard artifacts	B/Y % of total class	% Class for B/Y assemblage
Clothing classes								
Buttons	84	3	20	24	2.7	50	59.5	4
Sewing	48	1.7	2	4	0.27	14	29	1
Clothing	12	0.4	2	17	0.27	5	41.6	0.4
Furniture classes								
Furnishings	40	1.4	11	28	1.43	20	50	1.5
Ornaments	10	2.8	1	10	0.14	6	60	0.5
Lighting	4	0.1	2	50	0.27	1	25	0.1
Kitchen classes								
Lead capsules	203	7.2	47	23	6.1	81	40	6.1
Ceramics	237	8.4	34	14	4.4	155	65	12
Glass tableware	11	0.4	2	18	0.27	4	36.3	0.3
Medicine bottles	60	2.1	14	23	1.8	30	50	2.2

Classes	Total assemblage artifact numbers	Total assemblage %	S/Y artifact numbers	S/Y % of total class	% Class for S/Y assemblage	% Back yard artifacts	B/Y % of total class	% Class for B/Y assemblage
Drinking glasses	107	3.8	29	27	3.8	56	52	4.2
Bottles	151	5.3	59	39	7.8	70	46.3	5.3
Kitchenware	5	0.1	1	20	0.14	3	60	0.2
Corks	6	0.1	2	33	0.27	2	33	0.2
Metal bottle caps	12	0.4	2	17	0.27	6	50	0.5
Metal containers	17	0.6	2	12	0.27	10	58.8	0.8
Metal can opening keys	6	0.1	0	0	0	4	66.6	0.3
Medicine other	5	0.1	0	0	0	4	80	0.3
Marble stoppers	1	0.1	0	0	0	1	100	0.1
Jars	11	0.4	0	0	0	10	91	0.8
Glass stoppers	9	0.3	0	0	0	6	66.6	0.5
Activity classes								
Food	310	11	99	32	13	161	52	12.2
Shells	150	5.3	51	34	6.6	96	64	7.2
Fishing	2	0.1	1	50	0.14	1	50	0.1
Tobacco packets	4	0.1	1	25	0.14	3	75	0.2
Miscellaneous	13	0.5	4	31	0.54	6	46	0.5
Rodent bone	11	0.4	5	45	0.7	5	45.5	0.4
Tools	1	0.1	0	0	0	1	100	0.1
Travel	1	0.1	0	0	0	1	100	0.1
Personal classes								
Writing	63	2.2	14	22	1.8	29	46	2.1
Toys	30	1	4	13	0.54	16	53	1.2
Bathroom	9	0.3	2	22	0.27	6	66.6	0.5
Coins	1	0.1	1	100	0.14	0	0	0
Jewelry	4	0.1	2	50	0.27	1	25	0.1
Beads	10	0.4	3	30	0.42	3	30	0.2

(continued)

Table 8.2 (continued)

Classes	Total assemblage artifact numbers	Total assemblage %	S/Y artifact numbers	S/Y % of total class	% Class for S/Y assemblage	% Back yard artifacts	B/Y % of total class	% Class for B/Y assemblage
Tobacco pipes								
Tobacco pipes	61	2.2	16	26	2	29	47.5	2
Architectural classes								
Window fittings	161	5.7	79	49	10.16	48	29.8	3.6
Building	157	5.5	46	29	6	47	30	3.5
Nails	761	26.9	199	26	26	305	40	23
Door fittings	6	0.1	4	67	0.54	2	33.3	0.1
Architectural fittings	17	0.6	2	12	0.27	6	35	0.5
Arms								
Bullets	20	0.7	2	10	0.27	13	65	1

and corks. While the cork percentage is more a reflection of the small number of these items, two of which were found in this area, both bottles and drinking glasses are well represented in both the total database and the side yard collection making this a reflection of area usage. The artifacts and the attempt at cultivation suggest the southwestern side yard was used for recreation which involved both eating and drinking but with a larger emphasis on drinking.

While the side yard has a slightly higher percentage of artifacts for the amount of excavated area than the total database, the back yard area at 46.5% has virtually the same percentage as its percentage of total excavated area (Table 8.2).

At 33.6% kitchen-related artifacts still just dominate the back yard assemblage with architectural and activities being the other well-represented groups. Of the activity group, food is by far the dominate class adding to the dominance of items related to kitchen activities. The five kitchen classes missing from the side yard assemblage are present in small numbers in the back yard as are the two missing activities groups giving the back yard area all the artifact classes contained within the ca. 1882–1895 database except for the coin class. This time period contained only one coin, which was found in the side yard.

The back yard contained three times the percentage of ceramics but a lesser percentage of bottles than the side yard. It also contains a marble stopper from a soft drink bottle and a number of glass stoppers, which are more associated with sauce bottles than alcohol bottles. Of the ceramic shards that could be assigned a function, cups and saucers formed 40% and tableware such as plates, serving plates, jugs, and bowls formed 44.5%. Taken together the evidence suggests a dining area rather than an area where alcohol consumption was the main activity.

Building design shows adaptations to the extreme heat of the northwest during this period. Having the kitchen detached from the house was a southwest adaptation to both heat and fire risk and not particular to the northwest. However, photographic and archaeological evidence indicates the small building had a breezeway located in front of the oven orientated to the sea breeze and capable of being closed off by the two doors when required. The building also had a window in the wall opposite the chimney and both side walls to help heat escape and the sea breeze blow through. The Hall house on lot 116 also added a breezeway during this period by building an extension which was a separate structure with a covered gap between it and the original home. The breezeway was used as a dining and living area (HM Wilson, 1991 personal communication).

The orientation of the house was changed to conform to that of most of the residences shown in Fig. 6.11, facing the inlet, sea breezes, and in the case of this site the rest of the store complex on Lot 122. The house was extended by enclosed verandahs with additional verandahs for shade on two sides and the front verandah left open to provide shade on the side of the house facing the sea breeze. There is also archaeological evidence of blue bead door curtains coming into use in an effort to restrict the entry of Western Australia's famously friendly flies into the building. A major northwest adaptation first tried during this period is cyclone chains and anchors to hold the roof down during the violent winds of a cyclone.

1896–1910

Site Layout and Building Design

During this period, the building functioned as a store manager's house until being sold to J. Muramats in 1907 (Hutchison 1991). The most dramatic site changes through this period are in response to the damage caused by a cyclone in 1898 which flooded a significant portion of the town site including part of the Knight & Shenton building.

The cyclone was the severest recorded cyclonic event during the occupation of the Cossack town site. Not only was damage caused by the high winds but it was accompanied by a high storm surge which lifted the coastal steamer *Beagle* and left it stranded on top of the new Cossack land backed wharf. A similar, but not as severe, storm in 2005 was recorded flooding the southwestern end of the town site to Perseverance Street at the rear. A postcyclonic damage survey compared visual archaeology before and after the storm, recording evidence of sites being washed away within the flooded area and from the seaward face of the back beach dune the town is situated. The dune was eroded back for up to 5 m in some places between the government enclave and the former Chinatown area (Nayton 2010). However, the storm surge associated with the 2005 storm was not great enough to flood the Knight & Shenton building perched on the top of the dune, unlike the most damaging cyclone of 1898.

Archaeological evidence demonstrated conclusively that the 1898 storm did more than wind damage to the site. Excavations along the side of the site facing Pearl Street to the northeast of the house wall produced an assemblage which mean dated to ca. 1902. The 4 years of time lag in assemblage dating places this assemblage to around the time of the cyclone. All artifacts from this side of the site outside the house wall and alongside the kitchen show this same late date except for small pockets of artifacts lower in the site profile and situated hard against the house wall which have an early 1880s dating (Fig. 8.8). The pattern of pockets is consistent with a washing action, which left these small areas in situ while removing all else. A small section of the enclosing wall has also been washed away, and there is a thick deposit of shells within the house site at this point. Timber house posts have been replaced with concrete posts created by using an empty kerosene can as a mould (Fig. 8.9) at both corners of the affected wall, and two internal posts have been similarly treated (concrete posts are shown in position they were used not excavated position in Fig. 8.8 and 8.11 to better illustrate where damage occurred). The cyclone anchor at the northern corner of the building must have been washed away because a new anchor built from disused tram rails was used to anchor this corner.

The evidence of flood damage is all on Pearl Street side of the site, and it would appear the storm surge was channeled up the street thereby extending further in this area. The whole of Pearl Street side of the house has subsequently been supported by two retaining walls, one running parallel to the house wall for the length of the structure (Fig. 8.8) and a lower retaining wall running the length of the lot (Fig. 8.10).

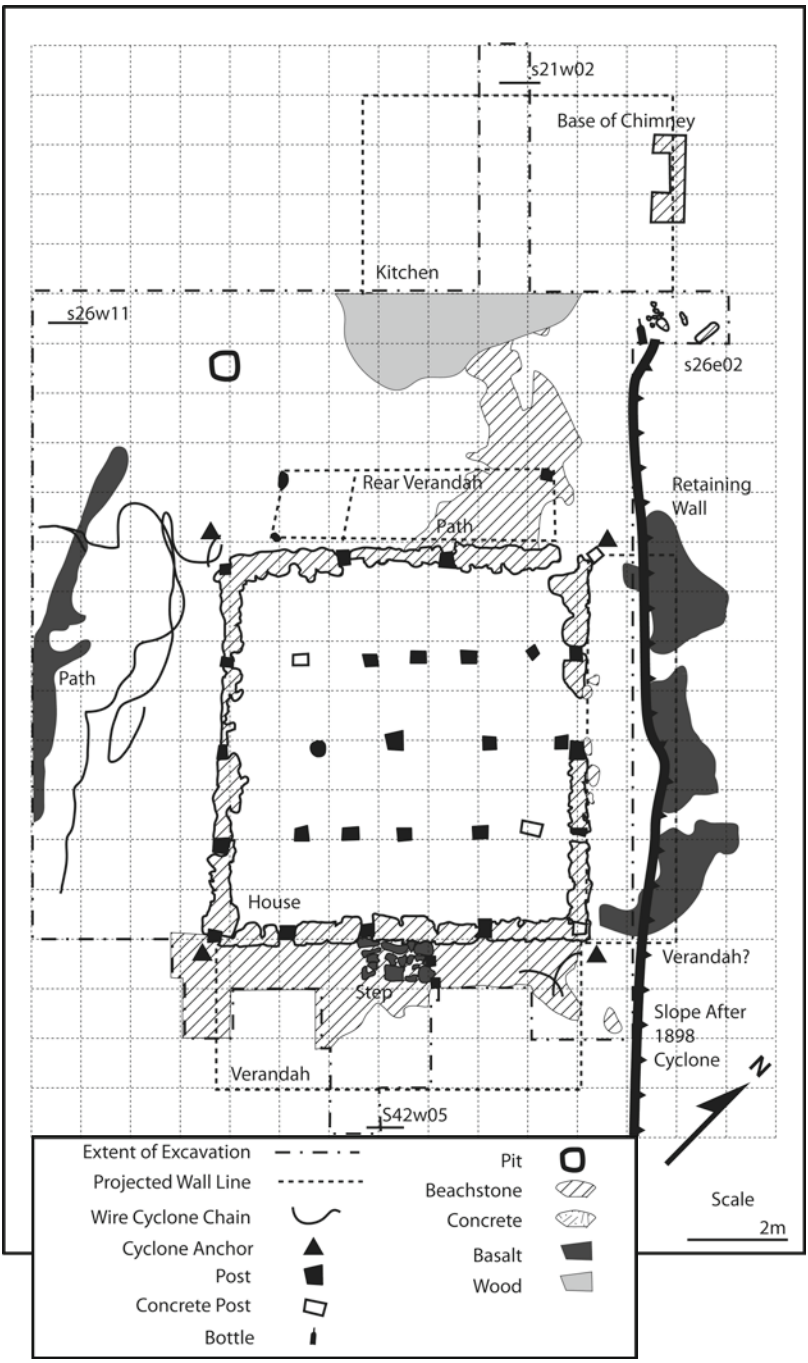

Fig. 8.8 1896–1910 Site plan

Fig. 8.9 House post made in a kerosene can mould

Fig. 8.10 View of post-1898 retaining walls along Pearl Street frontage

These walls are not present in the historic photograph taken from a ship moored at the jetty taken sometime between 1887 and 1895 and are clearly a response firstly to stabilize the buildings and secondly to stabilize the dune upon which they sat. Adjacent to the kitchen a bottle has been buried upright on the line of the top of the house retaining wall (Fig. 8.8). The bottle appears to have acted as a northwest version of a builder's string line peg for the wall construction. Intact bottles were used in a number of interesting ways in the northwest from creating garden borders throughout Cossack to forming the floor of the hotel at the port of Balla Balla.

Historic photographs (Fig. 6.9) and photographs of the ruined house taken in the 1970s show that advantage was taken of the presence of the new retaining wall and an open verandah was built along Pearl Street side of the house which, from its position, would have utilized the retaining wall as a foundation wall.

A thin layer of decomposed wood in squares s26w5 to s26w1 extending in s27w5 to s27w3 adjacent to the timber kitchen and above the flood damage suggests damage to the kitchen also occurred during the storm but Fig. 8.5, taken in the early twentieth century, shows the kitchen was not destroyed. Similarly the Knight & Shenton building was not destroyed. However, while the core of the house remained unchanged, the side verandah was clearly destroyed and a new, much smaller, structure put in its place. It is unclear from the archaeological evidence if the rear verandah continued in use through this period. Figure 8.5 shows a rear verandah attached to a structure at the side of the house. The photograph is loosely dated to ca. 1900, but the archaeological evidence suggests it is actually taken after ca. 1906. The step area in front of the front verandah was also paved with beach rock and a basalt rock step constructed adjacent to the encircling wall.

New features were added to the site at a slightly later date (Fig. 8.11), all mean dating to ca. 1910 suggesting they were put in place ca. 1906/1907 when the site was brought by Jiro Muramats, a Japanese pearling master, who became the last pearling master operating out of Cossack (Wise 1900). A water tank was added to the site and a beachstone wall, 1 m wide by 3 m long and the same height as the encircling wall, was constructed at the southern corner of the house parallel to the front of the building. The wall was accompanied by a cyclone chain anchor, and a second anchor dating to the same period was constructed parallel to it at the northern end of the side yard.

The obvious inference is that they were holding down a verandah roof covering the yard between them but the only evidence for a timber verandah suggests something much smaller. The roof may have been supported on the new wall to the south, but there is not a similar wall to the north. There is evidence of a structure with a concrete slab base in the general location, but the cyclone chain anchor is positioned, to a large extent, under the concrete and is itself overlain by a new Basalt path running alongside the side yard into the back yard. The path also lies under the concrete slab. These features suggest the concrete slab was a later addition that may be covering evidence relating to roof supports in that area. The only evidence that might be related to some sort of structure in the area of the slab is a layer of painted concrete rubble confined to spit 2 of square s32w9.

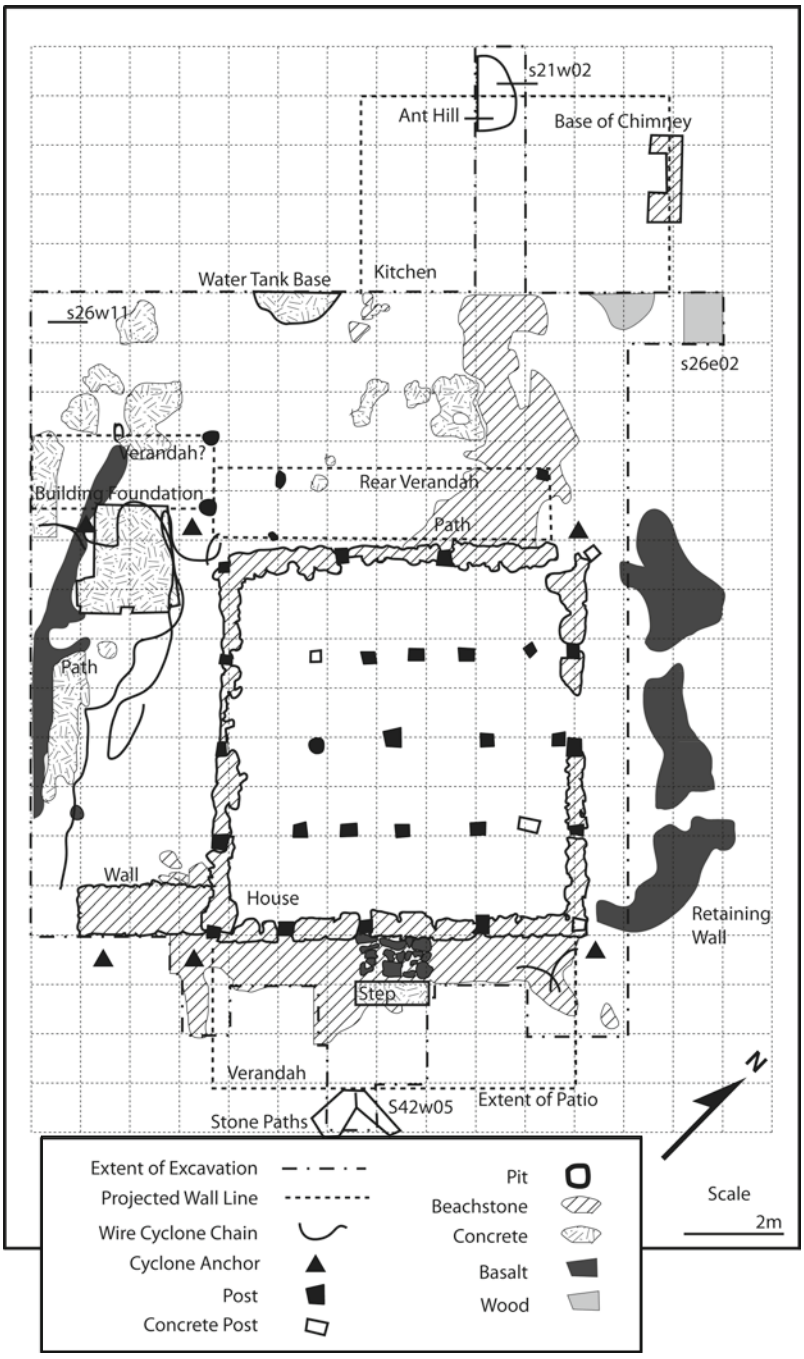

Fig. 8.11 Site plan ca. 1907–1920s

The ca. 1896–1910 database has 43 of the 48 artifact classes present at the Knight & Shenton Store site with the overall impression being of variety with very few classes dominating; 10% of the assemblage is bottle glass and 23% is nails, but these are the only two classes which extend into double figures (Table 8.3). A similar picture of variety was presented in the 1882–1895 database, which only had the nail and food group percentages in double figures (Table 8.2). Within the 1896–1910 database, the side yard excavation contributed 22.8% of the assemblage from 24.2% of excavated squares, the back yard contributed 42.6 from 46.7% and the front yard contributed 21.3 from 15.1% of excavated squares (Table 8.3) indicating more intensive activity areas in the side and front areas of the house.

In the assemblage as a whole, the architectural and kitchen group share dominance at 38.7 and 33.9%, respectively. The side yard contains about the same percent of the total assemblage as its percent of excavated squares for architectural, personal, and tobacco pipes but much less for other groups. The back yard area contains roughly the same percent of the assemblage as its excavated percent of the site only for kitchen and tobacco pipes. It contained a slightly greater percentage of personal and activities group and a significantly lower percentage of the architectural and furniture groups. This amount of architectural items suggests that the rear additional verandah was not destroyed and replaced as the side verandah appears to have been. The front yard area for this time period is again interesting as it contains a much greater percentage of all artifact groups, other than the arms group, than its percentage of excavated area.

What was actually found in each area gives clues to the activities which created the assemblages (Table 8.3). The side yard assemblage is dominated by architectural, kitchen, and activity group items. Nails (28.55%) and bottles (12.45%) dominate the assemblage, being the only artifacts classes in double figures, with window glass, building materials, ceramics, and lead bottle sealing capsules represented in smaller numbers. Other than architectural classes, no artifacts classes stand out as being in a higher proportion than the percentage of excavated area or being a larger percentage of the artifact class than expected except for a slightly higher number of the small artifact classes of fishing, coins, and jewelry. The area contains most of the more dominant artifacts classes in the assemblage but does not contain many of the smaller artifact classes. This suggests a more generalized use for the area than in the previous period.

The back yard is dominated by kitchen and activity group items with nails (21.8%) and ceramics (11%) being the only classes in double figures. There are smaller percentages of food, bottle, lead bottle sealing capsules, and shells. It has slightly higher than expected number of personal and activities groups with half of the 78 personal items and just over half of the 328 activity-based items found within the excavated 46.7% of the total excavated area for this time period. When compared to the total assemblage, the back yard area has higher than the excavated percentage of all kitchen group classes except bottles at 31% and the small groups of marble and glass stoppers. It also has a higher percentage of other small classes such as clothing, ornaments, tools, travel, toys, bathroom items, coins, and door fittings.

Four of the five bathroom accessories found in this assemblage were located in the backyard area, and all were associated with personal grooming being two

Table 8.3 1896–1910 Artifact percentage within yard areas

Total 1896–1910	Total side yard artifacts	S/Y % of total square meter	S/Y % of total artifacts	B/Y % of total square meter	B/Y total artifacts	B/Y % of total artifacts	Total front yard	F/Y % of total square meter	F/Y % of total artifacts
2,251	502	24.1	22.8	46.7	959	42.6	479	16.1	21.3

Groups	Total assemblage artifact %	Total assemblage % group	S/Y artifact numbers	S/Y % of total group	% for S/Y assemblage	Back yard artifact numbers	B/Y % of total group	% for B/Y assemblage	F/Y artifact numbers	F/Y % of total group	% for F/Y assemblage
Architecture	871	38.7	232	26.6	46.2	296	34	31	177	20.3	38.3
Furniture	66	2.9	4	6	0.8	26	39	2.7	30	45.5	6.1
Kitchen	763	33.9	138	18	27.5	368	48	38.4	151	19.8	31.3
Clothing	98	4.3	19	19.4	3.8	43	44	4.5	23	23.5	4.6
Personal	78	3.5	17	21.8	3.4	39	50	4	19	24.4	3.8
Activities	328	14.6	82	25	16.3	166	51	17.3	70	21.3	14.4
Tobacco pipes	21	0.9	5	23.8	1	10	48	1	6	28.5	1.1
Arms	26	1.2	5	19.2	1	11	42	1.1	3	11.5	0.4

Classes	Total assem-blage artifact %	Total assemblage % class	S/Y artifact numbers	S/Y % of total class	% Class for S/Y assemblage	Back yard artifact numbers	B/Y % of total class	% Class for B/Y assemblage	F/Y artifact numbers	F/Y % of total class	% Class for F/Y assem-blage
Clothing classes											
Buttons	64	2.8	13	20.3	2.6	30	47	3.1	14	21.9	2.9
Sewing	20	0.9	5	25	1	4	20	0.4	8	40	1.7
Clothing	14	0.6	1	7.1	0.1	9	64	0.9	1	7.5	0.2
Furniture classes											
Furnishings	43	1.9	3	7	0.6	19	44	2	22	51.2	4.6
Ornaments	10	0.4	1	10	0.1	6	60	0.6	4	40	0.8
Lighting	5	0.2	0	0	0	1	20	0.1	4	80	0.8
Kitchen classes											

Classes	Total assem-blage artifact %	Total assemblage % class	S/Y artifact numbers	S/Y % of total class	% Class for S/Y assemblage	Back yard artifact numbers	B/Y % of total class	% Class for B/Y assemblage	F/Y artifact numbers	F/Y % of total class	% Class for F/Y assem-blage
Lead capsules	133	5.9	18	13.5	3.6	73	55	7.6	29	21.9	6
Ceramics	179	8	29	16.2	5.8	105	59	11	24	13.4	5
Glass tableware	8	0.4	0	0	0	5	63	0.5	3	37.5	0.6
Medicine bottles	35	1.6	1	2.9	0.1	23	66	2.4	9	25.7	1.9
Drinking glasses	78	3.5	12	15.3	2.4	37	47	3.9	25	32	5.2
Bottles	233	10.4	62	26.6	12.4	73	31	7.6	51	21.9	10.6
Kitchenware	7	0.3	1	14.3	0.1	5	71	0.5	0	0	0
Corks	10	0.4	2	20	0.4	5	50	0.5	2	20	0.4
Metal bottle caps	40	1.8	7	17.5	1.4	19	48	2	5	12.5	1
Metal containers	23	1	4	17.4	0.8	13	57	1.4	0	0	0
Metal can opening keys	2	0.1	0	0	0	2	100	0.2	0	0	0
Medicine other	5	0.2	1	20	0.1	2	40	0.2	2	40	0.4
Marble stoppers	1	0.1	1	100	0.1	0	0	0	0	0	0
Jars	6	0.3	0	0	0	5	83	0.5	1	16.6	0.2
Glass stoppers	1	0.1	0	0	0	0	0	0	0	0	0
Plastic bottle cap	2	0.1	0	0	0	0	0	0	0	0	0
Activity classes											
Food	157	7	48	30.6	9.6	76	48	8	28	17.8	5.9
Shells	128	5.7	27	21.1	5.4	69	54	7.3	31	24.2	6.6
Fishing	2	0.1	1	50	0.1	0	0	0	1	50	0.2

(continued)

Table 8.3 (continued)

Classes	Total assem-blage artifact %	Total assemblage % class	S/Y artifact numbers	S/Y % of total class	% Class for S/Y assemblage	Back yard artifact numbers	B/Y % of total class	% Class for B/Y assemblage	F/Y artifact numbers	F/Y % of total class	% Class for F/Y assem-blage
Tobacco packs	10	0.4	2	20	0.4	4	40	0.4	2	20	0.4
Miscellaneous	20	0.9	4	20	0.8	11	55	1.1	5	25	1
Rodent bone	3	0.1	0	0	0	1	33	0.1	0	0	0
Tools	6	0.3	0	0	0	3	50	0.3	3	50	0.6
Travel	2	0.1	0	0	0	2	100	0.2	0	0	0
Personal classes											
Writing	29	1.3	7	24.1	1.4	14	48	1.5	7	24.1	1.5
Toys	25	1.1	4	16	0.8	15	60	1.6	6	24	1.3
Bathroom	5	0.2	1	20	0.1	4	64	0.4	0	0	0
Coins	3	0.1	1	33.3	0.1	2	66	0.2	0	0	0
Jewelry	3	0.1	1	33.3	0.1	0	0	0	1	33.3	0.2
Beads	13	0.6	3	23	0.6	4	31	0.4	5	38.5	1
Tobacco pipes											
Tobacco pipes	21	0.9	5	24	1	10	48	1	6	28.6	1.3
Architectural classes											
Window fittings	150	6.8	47	31.3	9.4	37	25	3.9	37	24.7	7.8
Building	184	8.2	37	20.1	7.4	43	23	4.5	46	25	9.7
Nails	516	23	143	27.7	28.5	208	40	21.8	90	17.4	18.8
Door fittings	3	0.1	1	33.3	0.1	2	66	0.2	0	0	0
Architectural fittings	18	0.8	4	22.2	0.8	6	33	0.6	4	22.2	0.8
Arms											
Bullets	26	1.2	5	19.2	1	11	42	1.1	3	11.5	0.6

combs, a mirror, and a toothpaste pot. Three were found associated with the area of the rear additional verandah that is thought to have been enclosed during the previous time period, as was one of the door fittings and most of the clothing items were found in this area or further to the west. The concentration of materials suggests the enclosed area functioned as a bathroom or wash-up area.

Items that might be expected to be associated with dining and table settings are clustered in the west of the backyard particularly between s27w8 and s31w8 with square s30w10 being conspicuous in its abundance containing 17 ceramics, 31 food items, 34 shells, 17 bottles, 5 pharmaceutical bottles, and 9 drinking glasses. It also contains high numbers of buttons (7), furnishings (11), and toys (4) with the associated area of clustering also containing most of the tin cans, tin can keys, tobacco packets, kitchenware, toys, and half of the clothing items. The area has much stronger clustering for these types of items than the area immediately adjacent to the kitchen door, although this does have a smaller subset of clustering. This strongly suggests a family dining area in this part of the yard.

The front yard area is dominated by the architectural and kitchen groups with nails (18.8%) and bottles (10.6%) being the only classes in double figures (Table 8.3). However, the area contained an much higher than expected percentage of the total assemblage collection of all of the furniture classes, two of the three clothing classes, most personal and activity classes, although not all the classes from these groups were present, tobacco pipes and several of the kitchen group classes. The area contained nearly half the glass tableware (37.5%) and medicine other classes (40%), and a high percentage of the medicine bottles (25.7%), drinking glasses (32%), lead bottle sealing capsules (21.9%), bottles (21.9%), and corks (20%).

Some of these high percentages are because of the low numbers of the class found within the assemblage such as the medicine other class, which was represented by only five items two of which were found in the front yard and glass tableware which had only a total of eight items. However, the furnishing group was reasonably well represented in the assemblage. Bottles, ceramics, lead bottle sealing capsules are also common therefore the relative balance of classes is telling a story. The furnishing evidence is mainly eyelets with black canvas, brass rivets, and washers and includes a decorative nail and a wall bracket. The area also contains glass for a kerosene lamp indicating the presence of a lamp, perhaps hung on the bracket. The furnishing artifacts collectively suggest chairs, possibly leather or canvas rather than furniture such as sideboards and cupboards, and the total assemblage is suggestive of an area under the front verandah where people sat taking in the view and evening sea breezes, drinking, writing, and socializing while children played nearby.

1911 to Late 1920s: Late 1920s to 1941

In 1907, the North West Mercantile Store complex including the old Knight and Shenton building was sold to a Japanese man, J. Muramats, who by this time was not only a storekeeper but a pearling master as well. The Knight & Shenton building became a Japanese laundry run by T. Masumoto until the late 1920s (Wise 1920),

after this Muramats used the building as accommodation for his pearl divers. The Japanese at Cossack were interned after the Japan entered World War II ending the occupation of the Knight & Shenton building site, with the rest of the town finally being completely abandoned some time after the war.

The surface areas of the site were progressively covered with hard covers at the start of this period (Figs. 8.11 and 7.1) and this means that the archaeological evidence is sitting in a layer of sand over stone and concrete. This layer was removed in two spits across most of the site, but only ten excavation squares had a 1911–1920s spit under the later 1930s spit and they are scattered across the kitchen, backyard, and side yard areas. The squares are too scattered to give reliable indications of activity areas, and the periods 1911 to late 1920s and late 1920s to 1941 need to be considered together to determine activity areas.

Unfortunately, this combines the period the site was used as a laundry with that of pearling diver accommodation. It is unlikely that the two sets of occupants used the yards in exactly the same way so patterning for the Japanese occupation is likely to be more blurred.

Culling artifacts from the database that have a manufacturing start date after the end of occupation results in the removal of 108 artifacts, but this does not satisfactorily remove postdepositional blurring considering many artifacts which had manufacturing start dates prior to 1941 were still available for campers to drop on the site right up to the date of excavation. Removing 1930 period artifacts to separate out the laundry occupation from the later occupation and casual use reduced the assemblage down to 1592 (Table 8.4) but still did not significantly reduce blurring as many artifact types had manufacturing dates which spanned both occupations and often even the entire postoccupation casual use period. The assemblage was further reduced to just those with manufacturing end dates prior to the end of occupation, but this uncovered only a generalized spread of most artifact types with only a concentration of ceramics close to the western wall of the house showing as a possible use specific based pattern.

However, artifact dating across the surface layers did indicate that the Basalt path and rough concrete in the western side of the back yard were laid prior to ca. 1920 (Fig. 8.11). The Basalt path is associated with the concrete base of a water tank located just within the excavated area at s26w5-w8. The path is also associated with timber posts from a verandah attached to two small outbuildings with concrete slabs, which divided the rear and side yards. Within the side yard, the Basalt path skirting the area was widened with concrete. In the front yard, a concrete front step was added, the paved verandah area expanded to a depth of 3 m from the house, and it was linked to two stone paths leading down the dune to either side of the North West Mercantile Store (Fig. 8.12).

The kitchen was clearly abandoned and left to fall down in the 1920s. A thick layer of decomposed wood mean dating to the 1920s was found spreading down the slope within the two retaining walls (Fig. 8.11). This layer was overlain by a stone rubble layer dating to the 1940s (Fig. 7.1). The stone rubble from the disintegration of the stone chimney also overlay the surface of the trench through the kitchen area. Underneath this, except where an ant nest has mixed the evidence in square s21w2,

Table 8.4 1910–1941 Artifact percentage in yard areas

Total 1910–1939		Total 1910–1929				B/Y % of total square meter		B/Y total artifacts			
2,075		1,592				1582		76			
Group	Total assemblage artifact numbers	Total assemblage % group	S/Y artifact numbers	S/Y % of total group	% for S/Y assemb-lage	Back yard artifact numbers	B/Y % of total group	% for B/Y assemb-lage	F/Y artifact numbers	F/Y % of total group	% for F/Y assemb-lage
Architectural	391 (331)	18.8	–	–	–	255	65	16	–	–	–
Furniture	64 (59)	3.1	–	–	–	51	79.6	3.2	–	–	–
Kitchen	974 (646)	46.9	–	–	–	755	77.5	47.7	–	–	–
Clothing	66	3.2	–	–	–	49	74	3.1	–	–	–
Personal	62	3	–	–	–	47	75.8	3	–	–	–
Activities	445	21.4	–	–	–	367	82.5	23.2	–	–	–
Tobacco pipes	13	0.63	–	–	–	9	69	0.57	–	–	–
Arms	60	2.9	–	–	–	49	81.7	3.1	–	–	–
Classes	Total assemblage artifact numbers	Total assemblage % group	S/Y artifact numbers	S/Y % of total group	% for S/Y assemb-lage	Back yard artifact numbers	B/Y % of total group	% for B/Y assemb-lage	F/Y artifact numbers	F/Y % of total group	% for F/Y assemb-lage
Clothing classes	*66*	–	–	–	–	*49*	–	–	–	–	–
Buttons	42	63.6	–	–	–	31	73.8	63	–	–	–
Sewing	11	16.7	–	–	–	5	45.5	10	–	–	–
Clothing	13	19.7	–	–	–	13	100	26.5	–	–	–
Furniture classes	*64*	–	–	–	–	*51*	–	–	–	–	–
Furnishings	46 (45)	72	–	–	–	35	76	68.6	–	–	–
Ornaments	2 (2)	3	–	–	–	2	100	0.08	–	–	–
Lighting	16 (12)	25	–	–	–	14	87.5	28.6	–	–	–
Kitchen classes	*974*	–	–	–	–	*755*	–	–	–	–	–

(continued)

Table 8.4 (continued)

Classes	Total assemblage artifact numbers	Total assemblage % group	S/Y artifact numbers	S/Y % of total group	% for S/Y assemb-lage	Back yard artifact numbers	B/Y % of total group	% for B/Y assemb-lage	F/Y artifact numbers	F/Y % of total group	% for F/Y assemb-lage
Lead capsules	43 (43)	4.7	–	–	–	32	74	4.2	–	–	–
Ceramics	119 (111)	12	–	–	–	102	85.7	13.5	–	–	–
Glass tableware	2 (2)	0.21	–	–	–	2	100	0.25	–	–	–
Medicine bottles	20 (19)	2.1	–	–	–	14	70	1.8	–	–	–
Drinking glasses	51 (37)	5	–	–	–	36	70.6	4.8	–	–	–
Bottles	289 (168)	29.7	–	–	–	198	68.5	26	–	–	–
Kitchenware	18 (16)	1.8	–	–	–	14	77.8	1.8	–	–	–
Corks	23 (23)	2.4	–	–	–	14	60.9	1.8	–	–	–
Metal bottle caps	247 (148)	25.4	–	–	–	209	84.6	27.7	–	–	–
Metal containers	45 (34)	4.6	–	–	–	38	85.4	5	–	–	–
Metal can opening keys	2 (2)	0.2	–	–	–	2	100	0.25	–	–	–
Medicine other	25 (1)	2.6	–	–	–	25	100	3.3	–	–	–
Jars	9 (8)	0.92	–	–	–	8	8.9	1	–	–	–
Glass stoppers	1 (1)	0.1	–	–	–	1	100	0.12	–	–	–
Foil capsules	25 (25)	2.6	–	–	–	18	72	2.4	–	–	–
Foil food packets	35 (0)	3.6	–	–	–	27	77.1	3.6	–	–	–
Plastic bottle cap	20 (2)	2.1	–	–	–	15	75	2	–	–	–
Activity classes	*445*		–	–	–	*367*			–	–	–
Food	259	58	–	–	–	225	86.9	61	–	–	–
Shells	84	18.9	–	–	–	72	85.7	19.6	–	–	–
Fishing	5	1.1	–	–	–	4	80	1.1	–	–	–

Classes	Total assemblage artifact numbers	Total assemblage % group	S/Y artifact numbers	S/Y % of total group	% for S/Y assemb-lage	Back yard artifact numbers	B/Y % of total group	% for B/Y assemb-lage	F/Y artifact numbers	F/Y % of total group	% for F/Y assemb-lage
Tobacco packets	27	6.1	–	–	–	18	66.7	4.9	–	–	–
Miscellaneous	56	12.6	–	–	–	38	67.9	10.4	–	–	–
Bone	8	1.8	–	–	–	4	50	1.1	–	–	–
Tools	4	0.9	–	–	–	4	100	1.1	–	–	–
Travel	2	0.45	–	–	–	2	100	0.5	–	–	–
Personal classes	*62*	–	–	–	–	*47*	–	–	–	–	–
Writing	22	35	–	–	–	18	81.8	38	–	–	-
Toys	17	27	–	–	–	12	70.6	25.5	–	–	–
Bathroom	12	19	–	–	–	11	91.7	23	–	–	–
Coins	5	8.1	–	–	–	1	20	2.1	–	–	–
Jewelry	3	4.8	–	–	–	2	66.7	4.26	–	–	–
Beads	3	4.8	–	–	–	3	100	6.4	–	–	–
Tobacco pipes	*13*	–	–	–	–	*9*	–	–	–	–	–
Tobacco Pipes	13	100	–	–	–	9	69.2	100	–	–	–
Architectural classes	*391*	–	–	–	–	*255*	–	–	–	–	–
Window fittings	126 (74)	32	–	–	–	65	51.6	25	–	–	–
Building	214 (213)	54.7	–	–	–	158	73.8	62	–	–	–
Nails	13 (7)	3.3	–	–	–	3	23.1	1.2	–	–	–
Door fittings	16 (16)	4.1	–	–	–	13	81.3	5.1	–	–	–
Architecture fittings	22 (21)	5.6	–	–	–	16	72.7	6.3	–	–	–
Arms	*60*	–	–	–	–	*49*	–	–	–	–	–
Bullets	60	100	–	–	–	49	1.7	100	–	–	–

Fig. 8.12 View of paths leading from front step to either side of the store building on Lot 122

spits 1 and some of the lower spit 2's within the trench mean date to the 1930s. However, the artifacts from these spits do not indicate a functioning kitchen. Of the 73 artifacts from unmixed squares, 44 are from the kitchen group. However, three of the kitchen artifacts were shards of the cast iron kitchen stove lying within the soil layers, and the rest were dominated by items relating to drinking with bottles, bottle tops, and drinking glasses constituting 37 of the 44.

While the kitchen may have been abandoned as a functioning kitchen in the 1920s, the fireplace and stone chimney may have served to heat water to launder clothes. The evidence from the clothing and personal groups of the whole assemblage, despite occupational period blurring, suggests clothes indicating that perhaps people washed clothes in the eastern side of the backyard near the former kitchen door during the laundry period of site use. It is also noticeable that evidence for the stone chimney falling down is confined to the 1930s after the end of the laundry occupation.

If the 1990 excavation suggests the laundry washed clothes in the back yard, that from Peter Board's 1979 excavation suggests the clothes were mended and packaged for delivery within the house. They may have also been ironed there. Personal communication from Peter Board indicated that thousands of pins were excavated from within the outline of the encircling stone wall in 1979 while the 1990 excavation recovered only 11 from this time period. However, the artifacts were identified as a type which moved easily down sand profiles, therefore more are probably associated with the period. The total pin count for the 1990 excavation, however, would still not seem to match the description of the numbers found in 1979. Unfortunately, the location and number of pins were not recorded, and the artifacts are now lost removing any ability to research room use associated with the laundry operations.

Some of the stone rubble from the chimney is overlain in square s26e1 with the foundations of an iron shed situated across the eastern side of the backyard between

the former kitchen and the Knight & Shenton building (Fig. 7.1). This shed was the only standing building in 1979 when the site was finally destroyed. Spits within the area of the shed and patches of friable concrete forming a rough floor mean date to the 1940s suggesting the shed was one of the last things built on the site and date it to the occupation by the Japanese divers.

One last feature which clearly postdates the abandonment of official occupation of the site is a cyclone chain anchor in squares s29w10 and s29w11 consisting of part of a bed head surrounded by a closely packed circle of bottles which formed the main part of the anchor. The bottles were arranged in successive layers forming a neat drum shape within the sand. Almost all were Penfolds port bottles of a type first manufactured in 1949 (Fig. 8.13: dating supplied by Andrew Kitt from Penfolds wines). The anchor was located too far from the shed to be associated with

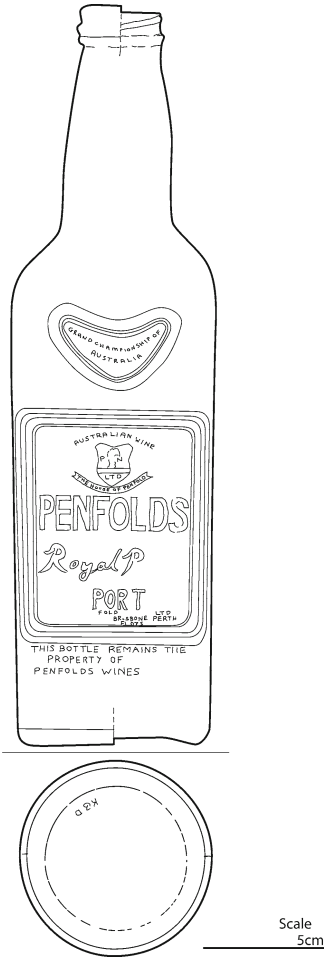

Fig. 8.13 Penfold's port bottle type used in cyclone chain anchor W1

it and instead it appears to be associated with the ca. 1920s concrete foundation at the extreme west of the back yard. The presence of this new cyclone anchor on a site which was unoccupied indicates casual use of the site by campers and fishermen which was extensive enough to extend to repairs. This casual use will further complicate assessing activity areas within the database.

Feature information suggests the site was progressively filled in to reduce areas of sand surface during the Japanese occupation of the site. Additional outbuildings were added to the complex, and the building was more firmly linked to the store and warehouse on Lot 122 then when it functioned as the manager's house. At the same time, the 1880s kitchen was abandoned and it is likely that the kitchen moved inside the Knight & Shenton building at this time, as it was not replaced with a new detached kitchen.

Conclusions

Building Design

The excavated buildings from the start of the occupation period showed design thought to be associated with surviving frequent cyclones. The original Knight & Shenton store building of 1870 showed little design thought given to living in extreme heat but some adaption to the dangers posed by cyclones in its building material choice, location, and structural design. Indeed, the original building was built so well it was only once breeched by cyclonic storm surge. Further, the jarrah posts sunk so deeply into the sand appeared to have functioned as an adequate anchor for the building, which being on the top of a back beach dune, was not protected from cyclonic winds. The original and expanded structure was sufficiently well built that it survived abandonment through 40 years of cyclone seasons and termites before finally sustaining structural damage during the worse cyclone of the 1970s.

Accumulating cyclone damage prevention measures are also noticeable through time. The 1870s timber roof was built of large timber sheets rather than shingles and originally battened down with timber strips. Cyclone anchors and chains, a system where chains were looped over the roof and held down by heavy clumps of buried metal, replaced timber battens in the early 1880s. The archaeological evidence of varying chain thickness on site suggests chains may have increased in thickness over time and evidence from other sites within the town suggests the cyclone anchors also became more sophisticated over time (Fig. 8.14).

The archaeological evidence clearly shows that the additional verandahs attached to the expanded building were vulnerable to cyclone damage and needed to be rebuilt often, particularly the verandah running down the southwestern side of the house. However, this vulnerability was not addressed while the building housed an elite family. It was not until the site was taken over by a Japanese business man for use as a laundry and house for his laundry worker's family that the

Fig. 8.14 Cyclone chain anchor set into concrete block

side verandah was strengthened with a protecting stone wall and cyclone anchors. There is no strong excavated evidence that the strengthened area functioned as the laundry, indeed the evidence suggests the clothes were washed near the kitchen and were mended within the house. The verandah therefore does not appear to have been strengthened for a business reason but as part of the laundry workers family use of the site.

Adaptation to the extreme heat of the northwest was not a major part of the original design for the combined store/house despite the building being the house of a regional development elite. But in the mid-1880s, the building lost its store function and became just a house. This reduction in functions was not accompanied by lesser activity but by a major upgrade and expansion of the original building. The new design showed several adaptations to extreme heat conditions.

The kitchen was built 5 m away from the expanded house. In the southwest, detached kitchens were designed this way to combat both the danger of fire to a timber structure and summer heat which even in the southwest can reach 40°C during summer. This design solution was clearly taken to the northwest. The location of the kitchen on the very ridge of the sand dune and the number and orientation of doors and windows were clearly an adaptation to create breezeways through the small building, especially near the kitchen stove.

The new design for the house was also factored around catching the onshore afternoon breeze from the inlet. Western Australia has a large temperature gradient between the sea and the land which creates one of the strongest and most reliable afternoon onshore breezes in the world. A cooling breeze so reliable, it is known as the "Fremantle Doctor" in the southwest. The original building, as shown in Fig. 6.5, was unusual in not being designed to take advantage of this breeze. This is likely to have been because it had a store function, which required it faced the shopping street which overrode the requirements of the accommodation function within the original design. However, once the store function was removed, this was no longer a limiting factor and the orientation of the building was changed to face the inlet.

The original structure was encircled with an outer row of rooms with the front left unenclosed to form an open verandah facing the sea breeze. Additional verandahs were further added to the outside of the additions on two sides creating shade protection for the new interior rooms. This configuration with various changes to the additional verandahs lasted for the life of the structure except for the addition of a third shading verandah to Pearl Street side of the house as part of the repairs and alteration after the 1898 cyclone.

From the beginning, the choice of building material and structural design of the original Knight & Shenton building was suggestive of expressing elite status and a sense of permanence at odds with the lightly built structures within the town at that time. The location of the building in the center of the town, opposite the landing place and the wreck of the *New Perseverance* acting as customs house and inn, places it in the highest bid rent location within the town at the crossroads and transshipment point created by the landing place and Pearl Street. At the time, the Strand had not been created, and people and cargo were not traveling from Cossack by road but by river lighter to Upper Landing. The location, different materials, and strong structure of the building are very clear statements of both status and permanence within the fledgling port.

These status markers were transferred on to McRae & Co when they brought Knight & Shenton out to create a branch store at the new port. The 1872 town survey created the Strand and a lot lower on the dune between the store and the landing. A rival store constructed from sheet iron was built on this lower lot and almost immediately was damaged by cyclonic storm flooding. McRae & Co took the opportunity to buy the land (Hutchison 1991) creating for their branch store a monopoly on the two highest bid rent retail spaces in Cossack.

When they brought the store, they had plans to build a warehouse to service it (Inquirer 7/2/1872). Figure 6.1, which dates to 1886, shows that they positioned their largest building partly up on the side of the sand dune to avoid the area near the Stand that was prone to flooding. This is likely to have been the warehouse for the store. A further smaller building was constructed closer to the foot of the dune and overlies the boundary with Lot 121. This lot was bought by McRae & Co in 1881, so this building is likely to date between 1881 and 1886. Once there were two buildings on the front lot, one would have functioned as the warehouse and the other as the store, leaving the original building as the manager's house.

By the mid1880s, McRae & Co had developed into successful regional development elites who dominated the central nongovernment high bid rent lots within the town. This translated into the amended building design for the original store/house. Although the structure was no longer multifunctional, the size of the building increased from 14 m square to approximately 62 m^2, and Fig. 6.1 shows that it was expanded to be within the higher size range for single household dwellings in Cossack for the time. It also incorporated drystone foundation walls in the extension, a use of material that was confined to urban and pastoral elites in the 1880s. The new and expanded house also incorporated attempts at creating a garden within a yard used for recreational drinking and eating. A pleasure garden, however small, in a town subjected to extreme weather conditions and reliant on a thin lens of fresh

water overlying salt for all its water needs is, in itself, an expression of status and the ability of the creator to control their environment.

During the occupation by regional dependency elites controlled by a southwest entrepreneur, no obvious signs of status were added to the site. The emphasis on alterations was on preventing the building from falling down after part of its supporting dune had been washed away, but an additional open verandah was added along Pearl Street.

During the occupation by Japanese workers, most of the yard area around the site, particularly the backyard, was paved in some form. Basalt paths were added to existing beachstone paths, and concrete was used for outbuilding slabs, water tank base, and front step. A series of rougher more friable concrete mixes were used more like a patchwork of crazy paving slabs to fill in bits between stones and other concrete mixes.

There is a lot of activity and change which happens when Muramats has control of the building. The provision of a water tank, one of the few in Cossack, is probably linked to the use of the site as a laundry, which of course requires a great deal of water. The paving across, particularly the back yard, is probably an attempt to keep sand dust down linked to the laundry function. The way the function was achieved through oddments of concrete does not suggest it was linked to any attempt at status display.

There is no information on the uses of the two new outbuildings, and they may also be linked to the laundry function or they may have been necessary because the laundry operations took over at least a part of the main building.

While there is a lot of change and upgrade, most appears to be linked to a change in function rather than attempts to assert elite status or to emphasis nonconformity to the prevailing elite norm. However, in buying the store and moving his workers out of Chinatown and into the heart of Cossack, Muramats, as a Japanese businessman and pearling master operating after the introduction of the White Australia Policy, has already made a huge status statement. This move says that he is enough of an elite in the Pilbara not to be constrained by Federal policies written largely to curtail the business activities of Chinese and Japanese businessmen in Australia.

Changing Use of Yard Spaces

It is unfortunate that at this particular site, a well-meaning attempt to preserve heritage has led to the evidence from within the main building being removed without recording. However, the evidence from around the building suggests that each set of occupants utilized the space in different ways.

In the original occupation and use, the store function had priority use over the front of the building facing Pearl Street and the southeastern side of the building facing the jetty and the McRae & Co warehouse. The private area of the site was to the side facing away from the Inlet and to the rear of the house, which during this period was the area furthest from Pearl Street. The area to the rear of the building (which later became the side yard) was utilized mainly for drinking activities with

food storage facilitates near the northern end of the yard to the west of the main building. In this area, there was at least one outbuilding related to food storage and an area to the northwest of the main building which was related to food consumption that may have been outdoors or within a very lightly built structure. Beyond this domestic space to the north of the main building was a further outbuilding located 7 m from the store/house. Artifacts associated with it were minimal and associated with the presence of a person rather than function. However, two artifacts suggested an office function while a room used mainly for sleeping is also a strong possibility.

When the house was extended and its orientation changed, it lost both its store function and its relationship to Pearl Street. The enclosed verandah on Pearl Street side of the house had no windows, and the site was fenced off from Pearl Street by a picket fence. The Pearl street side of the house was clearly then not viewed as a high priority or high-status area during this period of occupation. Food preparation moved into a new purpose built kitchen at what was now the rear of the house, and the yard behind the house was less used than previously, although the artifacts suggested strongly that it was used for outside dining. Artifacts and features relating to cultivation point to the side yard, which was partly open to the afternoon breezes, being a recreational area where both food and drink were consumed but with a greater emphasis on drinking than dining.

No major changes were made to the house during the next occupation by a store manager and his family, yet they utilized the area differently. The excavated artifacts indicated they used the side and front yards more intensely than the backyard. The backyard had a family dining area on its western side, and socializing had moved from the side yard to the front verandah where the evidence suggests people sat drinking, writing, and socializing.

The evidence from the two Japanese occupations is blurred together and with that from casual postoccupation site use. Several strands of evidence indicate the laundry operated across both the back yard, where water was boiled and clothes washed, and inside the house where clothes were sewn and probably ironed. Little else can be determined about the use of spaces for these occupations.

The Knight & Shenton store building was built partly as a status symbol and enlarged to keep a strong public show of status. The occupation by a homeland dependency elite was brief and is marked by practical damage control measures rather than taking the opportunity to replace the 28-year-old timber building with a newer structure. Muramats, by buying the McRae lots and then moving his workers out of Chinatown and into the elite heart of Cossack, was making more than a business move, it was an expression of resistance. Resistance to the ideology which had kept the Asian workforce crowded onto a sand dune next to the cemetery for 20 years, resistance to a succession of anti-Asian laws and policies accumulating in the repressive “White Australia Policy” of 1901 which outlawed Asians from running many types of businesses including retail stores and pearling luggers. And in the power void left in the Pilbara by the movement of the pearling fleet northward, it was a statement of domination. A statement that said “I, Jiro Muramats, am not only the only Asian pearling master, I am the only pearling master left in Cossack and you need me too much to resist.”

Chapter 9
Household Analysis: Assemblage Analysis

Assemblage Analysis

This chapters concentrates in illuminating how the northwest inhabitants of the Knight & Shenton store site used material culture to negotiate power and status relationships from 1870 through to 1941. The previous chapters have illuminated a series of questions about the expression of social relations at the household level. While some of these questions cannot be answered from one excavation site, the four different occupations allow the contemplation of several and this chapter is arranged as a series of questions and investigations.

> How different was surplus accumulation in the households of the northwest to that of households in the southwest of the same period?
>
> Did the short-lived northwest owned pearling fleet affect the northwest's balance of trade with Asia enough to make the material culture of the northwest different to that of the southwest?
>
> How did the dramatic change in trade relations associated with the regular steamship service affect the material culture of both Perthshire and Cossack?

These questions cannot be answered with the available material. Comparing household variability or content in Western Australia immediately comes up against the problem that there is no other comparable published Western Australian data. There exists 16 years of small test excavations reported in the "grey literature" of cultural resource management reports, several small student teaching excavations, and surveys with a number of honors dissertations arising from them and a very small number of MA or postgraduate dissertations. Master and honors dissertations are not available for comparison without the express approval of the writer and I thank those brave enough to offer up their early work to peer scrutiny within this volume. There are only three PhD dissertations on Western Australian historical archaeology. One (Steding 1995) is on the material culture of Fremantle Prison, one is on shore-based whaling (Gibbs 1995), and the third on early southwest homestead layout patterns rather than household material culture (Burke 2004). None are, therefore, directly comparable to a large excavation on a store/household site. A large excavation of a first settlement site is ongoing (Burke 2007) and promises much for the future, but the data is not yet available for comparison purposes.

G. Nayton, *The Archaeology of Market Capitalism: A Western Australian Perspective*, Contributions To Global Historical Archaeology, DOI 10.1007/978-1-4419-8318-3_9,

However, as four chronological assemblages have been identified from the Knight & Shenton store site, they can be compared to each other and to sites outside Western Australia. Comparisons of the assemblages as a whole can examine issues such as distance as a force of cultural change on the Australian north western frontier and differences in surplus accumulation between household occupations. Functional analysis can also statistically compare the Knight & Shenton store site to other sites to highlight similarities and differences and the evaluation of artifact types and where they were used can inform on differences in status display within public and private space.

How Integrated with the British Trading Networks Were the Households of the Northwest?

The artifact identification and dating reported in Chapter 7 demonstrates that the Knight & Shenton store site assemblages were overwhelmingly composed of items of a British origin. The overall impression of the Knight & Shenton store assemblage is one of variety and consumption of the products of mass production.

The total assemblage has 45 classes of artifacts with 1,398 types within a total assemblage of approximately 9,000 artifacts. While the sheer number of types may be artificially high due to the difficulty of working with very small shards, a high degree of variety is still indicated and is not just confined to artifacts classes like ceramics and bottle glass where the small size of pieces may be contributing to an overestimation of type variety. Classes consisting of whole or nearly whole objects such as nails (91 types), glass bottle stoppers (20 types), lead bottle sealing capsules (88 types), buttons (147 types), and bead (16 types) also speak of variety.

The 1870–1882 assemblage contained 1,100 artifacts within 30 classes and 288 types, giving it a variety index of 3.8. The 1883–1895 assemblage contained 2,829 artifacts within 39 classes and 559 types, giving it a variety index of 5. The 1896–1910 assemblage contained 2,251 artifacts within 41 classes and 558 types, giving it a variety index of 4. The 1911–1941 assemblage contained 1,764 artifacts within 42 classes and 486 types, giving it a variety index of 3.6. The index is an average of number of artifacts per type and the very low numbers show the extreme variety at the site across all assemblages. Such variety, the prevalence of mass-produced items such as ceramics, and the almost nonexistence of evidence of long-term curation of items suggest the northwest was not just a supplier of raw materials to the British trading network, but was very much also a market for mass-produced consumer goods.

The participation of the northwest in the consumption of British-based mass-produced goods indicates that the northwest was very well integrated into the trading network. However, the extreme variety of items suggests a degree of having to take what arrived and suggests that full matching sets of items, such as a dinner table setting, may not have been available from the store. Because all the occupants were connected to the store in some way, they may not have been as free to order outside of the store network by mail order catalog as others in the northwest. Such

a hypothesis cannot be tested on the available evidence and awaits further excavation in the northwest.

The fine chronological dating methods used on the Knight & Shenton store site and other sites in Western Australia also allowed time lag to be accurately assessed for the four assemblages in Chapter 7 (Table 7.1).

A lag of approximately 4 years was identified for the assemblages as a whole. This is a significantly shorter period than those calculated for most of the 20 late eighteenth-/early nineteenth-century American sites demonstrated in Adams (2003:55), 17 of which had a time lag of 9–40 years. This suggests the Western Australian colony was significantly more integrated with the British trading network than the earlier American colonies, with either the British trading network or their postrevolution networks. This has implications for factoring cultural isolation as a major force for cultural change in Australia as it has been for so long in America.

However, the site indicates that the time lag for some artifact classes may be more variable than for the whole assemblage. The first structures built on the site in 1870 echo a composition of wrought and wire nail forms reported to be common in New South Wales colonial buildings in the mid-1860s where wire nails came to dominate by the 1870s (Varman 1987). This mix of nail forms also occurred at the southern pastoral stations of Thomas River Homestead (Aris et al. 2000) and Moir Homestead (Aris et al. 1998), both also known to have been built in the 1870s.

This suggests that in the 1860s and 1870s, both settlement frontiers in Western Australia lagged a little behind the New South Wales colony in their integration with the British trading network with regard to nail forms. This may have been because, until the Kalgoorlie gold rushes brought a rush of wealth and population to the state in the 1890s, Western Australia was a relatively poor colony with no easily worked iron deposits of its own. The colony was then entirely dependent on imported iron products provided by a sea trade with high freight rates. The use of older nail forms for at least 5 years longer than New South Wales colonists may point to hoarding and reuse in a metal poor colony.

Were There Differences in Surplus Accumulation Between the Regional Groups of the Northwest?

This question can only be investigated for the regional groups which resided at the excavation site. These were, in Paynter's (1989) terminology, early regional development elites, homeland development elites, and primary producers. The theoretical lumping of the two Japanese occupations into the same category of primary producer masks social differences between the two, with the laundry workers being unskilled workers and the Japanese divers highly paid skilled workers. However, depositional conditions have made the archaeological separation of the two latter groups impossible to separate across most of the site; therefore, the two groups cannot be looked at separately by archaeological means. However, when interpreting results, the fact that two groups of different primary producers are represented as one must be considered.

To investigate rates of surplus accumulation across the different occupations on the site, the differences between the assemblages that were caused by excavation differences need to be taken into account. The four chronological assemblages are of different sizes containing varying amounts of artifacts from varying numbers of spits. To directly compare them, the percentage of each group, class, or type within each database has been calculated and the percentages compared across assemblages.

A further complication arises with the 1910–1941 database, which does not contain all the architectural materials excavated from this layer. This is because the main building and adjacent shed were burnt in situ in 1979 depositing an overwhelming amount of architectural hardware on the site. This hardware was sampled only. To allow comparison of the 1910–1941 assemblage with the lower assemblages in Table 9.1, percentages and densities were calculated both with and without the architectural group.

The small 1911–1929 database while insufficient to determine activity areas, can be used to determine artifact density for the laundry period occupation. The artifacts that could be definitely associated with this period and with the postoccupation casual use period were removed from the 1911 to 1941 database before the density calculations in Table 9.1 were made to remove as much of the blurring as possible from the Japanese diver occupation period.

The calculations make it obvious that artifact densities per square meter were greatest for the 1882–1895 assemblage followed by the 1896–1910 assemblage. Even the early frontier period of occupation had greater density per square meter than either Japanese occupation. While this generally follows the wave-like curve that would be expected across time by frontier theorists, the downturn that creates the wave-like pattern in artifact numbers is not related to site abandonment as various people occupied the site until 1942. It is also not related to a major change in transport access to goods outside of the frontier caused by change in access of the site during a progress of frontier integration with the homeland.

Although Cossack only functioned as a port intermittently in the early twentieth century, it was within a kilometer of the new jetty and still only 12 miles away from the major administration center for the region. It remained well within reach of the regular steamship service which operated from 1883 throughout the period of site occupation. The site was therefore within easy reach of goods entering the frontier. Frontier theorists would still argue that the downturn in surplus accumulation is

Table 9.1 Comparing assemblage density

Data	Number	Architectural	Number spits	Density	Density without Architectural	Years	Density per year	Density per year without architectural
1870–1881	1,100	386	51	21.5	7.6	11	2	0.7
1882–1895	2,829	1,102	71	40	15.5	13	3.1	1.2
1896–1910	2,251	871	66	34.1	13.2	14	2.4	0.9
1911–<1929	203	55	10	20.3	–	18	1.1	–
1911–1941	1,764	336	96	18.4	–	30	0.6	–

linked to the movement of the frontier away from the Roebourne area and the settlement of this area into a more homeland-like configuration.

However, this is not the only explanation, particularly for this site. Archaeologists concerned with social interactions and expressions of status such as Paynter would associate the wave-like pattern with the change of status of the occupants which would give unequal access to surplus accumulation, and the loss of control over frontier surplus, which happened in the mid-1880s.

At this site, the takeover of the frontier by homeland elite and the arrival of homeland dependency elite can be directly related to one of the identified assemblages – as in 1892, the store was bought by a Fremantle merchant who then appointed C. Moore, a man thought to be a distant relative (not a son or sibling), as manager of the former Knight & Shenton store. Unlike W.D. Moore, C. Moore cannot be traced in the online bibliography of Australians (Australian National University 2006). However, given the nepotism which provided a lot of the cohesion within Western Australian business, it is likely he was a distant relative of W.D. Moore. Whether a relative or just an employee, C. Moore was trusted enough to run the first branch store of W.D. Moore's mercantile business arm. He was, therefore, still an elite and the density of artifacts suggests enough surplus was left in the frontier to maintain his status, but at a lower rate than that expressed by the regional development elite occupation. This is the first strand of archaeological evidence that suggests that the effect of early elite resistance and the collapse of that resistance is traceable in the material culture of Cossack households.

How is Domination and Resistance Expressed in the Culture of Cossack Households?

This is a complex question and needs approaching from different directions. Functional analysis can contrast and compare the structure of assemblages across different times and areas to highlight structural patterns within assemblages that may be the result of outside market capitalist forces rather than conscious individual choice. It can also highlight patterns in consumer choice that reflect notions of self and belonging within household assemblages, notions that illuminate how domination and resistance were expressed at the household level. Further analysis of artifact types and their use in public and private spaces across the site can illuminate what the occupants were affirming about their place in society.

Comparison to Early American Colonization

The assemblages have each been divided into functional groups based on South's (1977) categories with animal and fish bone removed from the activities group to conform to South's methodology. This was to allow comparison with South's frontier

pattern; however, the lack of architectural group items collected from the 1910 to 1941 site layers means that the percentages for this time period are skewed in favor of the other functional groups and so are not directly comparable (Table 9.2). South uses the kitchen and architectural groups as the main pointers as to whether a site belongs to his frontier or Carolina pattern (South 1977). In his Carolina pattern, the kitchen group is consistently at least twice the size of the architectural group; in the frontier pattern, this relationship is almost reversed. In the 1910–1941 assemblage, the architectural group is artificially low and would have been artificially high if all artifacts had been collected from the burnt building.

The four main assemblages were compared to the functional patterns found by South (Table 9.2). All three directly comparable assemblages from the store site have a kitchen group which falls within the parameters for South's frontier pattern, but the architectural group consistently falls below his parameters. Correspondingly, the smaller furniture, clothing, and personal groups have higher percentages than South's ranges with the larger activities group also having consistently higher percentages than South's frontier pattern. The arms group falls consistently below his percentages, while the tobacco pipe group is either below or at the lower end of his range.

There is not therefore any great similarity of pattern between South's frontier pattern from the eighteenth-century American frontier and the later Australian north western colonization. The ratios for the kitchen and architectural groups also do not fit South's Carolina pattern, with the kitchen group consistently falling under his ranges and the architectural group consistently falling above. The activities and personal group percentages are also above South's ranges.

In comparing South's sites, the Knight & Shenton store site is most similar to the Brunswick Town Hepburn-Reonalds site. A site that combined both house and shop functions, which was deviant in terms of both of his patterns, a deviation he put down, in terms of the frontier pattern, to it being in the center of a town, and therefore, it could "hardly be interpreted as a frontier site" (South 1977:154), but he does not give an explanation for why it deviates from his Carolina pattern, and as it is the only deviation within his data set, he cannot determine if the site represents a different pattern.

The Knight & Shenton store site and the Hepburn-Reonalds site are similar in that they are both situated within a frontier town and, for at least one period, both had combined store/domestic functions. They are also similar in that the proportions of the architectural and kitchen groups are closer than in either South's frontier or Carolina patterns, although both groups form a smaller part of the assemblage as a whole than they do at the Hepburn-Reonalds site. Activities again form a consistently larger percentage of the assemblage at the Knight & Shenton Store site, as do most other groups. The Knight & Shenton store site clearly shows a larger variation in its assemblage, which results in less domination by the kitchen and architectural groups than shown for these early American seaboard sites.

Lewis (1977) modified South's approach when attempting to distinguish between domestic and nondomestic sites. He used the difference between the percentages of functional groups associated with the collection, preparation, and consumption of food and those associated with buildings and people. He reasoned that there

Table 9.2 Comparing assemblage to South's functional groups

Group	South's frontier %	% Range	South's Carolina (%)	% Range	N/W 1870–1882 (%)	N/W 1883–1895 (%)	N/W 1896–1910 (%)	N/W 1910–1941 (%)	South's Hepburn-Reonalds House
Kitchen	27.6	22.7–34.5	63.1	51.8–69.2	28.7	29.7	33.9	46.9	45.2
Architectural	52	43–57.5	25.5	19.7–31.4	36.2	39	38.7	18.8	48.3
Furniture	0.2	0.1–0.3	0.2	0.1–0.6	2	1.9	2.9	3.1	0.2
Arms	5.4	1.4–8.4	0.5	0.1–1.2	0.5	0.7	1.2	3	0.1
Clothing	1.7	0.3–3.8	3	0.6–5.4	4.2	5	4.3	3.2	0.3
Personal	0.2	0.1–0.4	0.2	0.1–0.5	3.6	4	3.5	3	0.1
Tobacco pipes	9.1	1.9–14.0	5.8	1.8–13.9	3	2.1	0.9	0.6	4.6
Activities	3.7	0.7–6.4	1.7	0.9–2.7	10.45	9.2	10.3	14.5	1.2

Table 9.3 Comparison of Australian sites to Lewis's Camden analysis

Database	Subsistence (%)	Technological (%)	House/people (%)
K&S site			
1870–1882	51.50	0	48.50
1883–1895	52.70	0.20	47.10
1896–1910	47.80	1.30	50.90
1910–1941	66.60	3.30	30.10
1910–1941 adjusted	61.70	3	35.30
F.G.H. 1788–1800	50.00	0	50.00
F.G.H. 1800–1818	61.90	0	38.10
F.G.H, Sydney total	57.70	0.20	42.10
Camden			
Domestic	79–81	1	18–20
Shared dom/non	71–74	1	25–28
Non domestic	60–67	1	33–38

would be buildings and people-related artifacts whether the site was domestic or nondomestic, but artifacts associated with food would be less on a nondomestic site increasing the percentage of house/people-related artifacts. Table 9.3 shows the results of Lewis's analysis and a similar analysis on the Knight & Shenton store site assemblages. In the table, the 1910–1941 assemblage has been adjusted to include an architectural group of 38%, an average of the percentage of the first three databases, rather than the 18.8% of the partial recovery total to achieve a more comparable result.

The database ranges for the lower three assemblages do not fall anywhere near the percentages Lewis found at Camden (1977:187–188). The percentage relating to subsistence is lower and that for housing/personal higher for all three assemblages and they fit none of Lewis's identified functional groupings.

Clearly, the structural shapes of early American frontier assemblages and of a late nineteenth-century Australian frontier assemblages are very different. While the two sets of data relate to two different geographical regions, they also relate to different periods of capitalism. The American frontier in Carolina that both South and Lewis were investigating is from the time period of industrial capitalism when the gathering momentum of the industrial revolution was churning out infrastructure and using up primary producers as factory fodder. The Knight & Shenton store assemblage relates to the later market capitalism with its emphasis on primary producers as also being a market. The growth of a market economy could be presumed to account for the much higher housing and personal groupings within the Australian assemblages.

Lewis's groupings were also compared to the data from First Government House, Sydney (EAMC 2008). First Government House, Sydney, was occupied from 1788 to 1845 by a series of British governors overseeing the New South Whales colony. The site with its 1788–1845 date range overlaps the later part of the Carolina settlement studied by Lewis and is 25 years earlier than the earliest Knight & Shenton store site assemblage, so acts as an intermediary between the two.

The overall assemblage from First Government House shows a much greater correlation with the percentage ranges of the Knight & Shenton store assemblage than the Carolina sites. This could be because the later part of the First Government House assemblage was outweighing the earlier in the analysis. Therefore, to ensure a greater comparison with early Carolina, the occupations of the first four governors were teased out of the total assemblage and divided into two groups containing the two eighteenth-century occupations and the two early nineteenth-century occupations to determine if these early occupations corresponded more to the Carolina or Knight & Shenton patterns (Table 9.3).

The first period of occupation in Sydney shows a very similar structural shape in its artifact assemblage to the first occupation of the Knight & Shenton store site with an even division between the subsistence and architectural/personal groups. The second period falls within the range of the Lewis's nondomestic occupation as do both Japanese occupations of the Knight & Shenton site. Yet, while First Government House, Sydney, had a very real official function, it was still a home and that dual function never varied throughout its history. Similarly, the Japanese occupations combined at the Knight & Shenton store site both had domestic components, with one being nondomestic/domestic and the other purely domestic suggesting the domestic side of this assemblage should be dominate. However, both the unadjusted and adjusted percentages fall within the boundaries of Lewis's nondomestic grouping, indicating a much lower level of personal and household possessions and status display during the Japanese occupation and the consequent casual use of the site by visiting fishermen. Interestingly, this same picture emerges of the early nineteenth century. First Government House occupation, despite its much higher level of social status than the sites it has been compared too. Why this may have occurred at Australia's premier social status site and is it a real phenomenon or a construct of archaeological excavation are beyond the scope of this volume, but promise interesting areas of later research.

Comparison to Later American Colonization

In America, particularly in the west and northwest, a great deal of research has been carried out on how the structural shape of assemblages is affected by the occupational use of the site (De Cunzo 1987; LeeDecker et al. 1987; Praetzellis and Praetzellis 2004; Spude 2005, 2006; Spude et al. in press; Van Wormer and Gross 2006), particularly by the Cypress project which was able to study and characterize changes in privy pit assemblages linked to particular families across a working class suburb (Praetzellis and Praetzellis 2004). Spude used some of this information to refine sample assemblages for a predictive method for determining site use from the structure of an assemblage (Spude et al. in press). She used a total of 68 artifact collections to create 11 model assemblages thought typical of particular uses such as occupation by business families, by drinking business families, saloons, and that by transient male populations. Although the method has been criticized

(Gould 2002; Collings, 2010 personal communication) as not being mathematically pure Spude has showed, over a number of years and across a number of sites, that her method does have predictive power when used on American late nineteenth-/early twentieth-century sites.

Spude's methods have been used to compare the four Knight & Shenton store site assemblages with her eleven model occupation assemblages. The multiple linear regression analysis of the Knight & Shenton store assemblages was supplied by Dr Simon Collings. The results for the 1870–1882 assemblage are quite interesting, the combined store and elite male occupation most closely resembles a Skagway business family assemblage (Table 9.4). It is possible that the store component is skewing the results of this assemblage as none of the model assemblages are from general stores or combined general stores and domestic occupations, so the regression analysis can't match like with like.

Table 9.4 Results of multiple linear regression analysis

Date	Occupation type	Multiple linear regression results	Predicated occupations
1870–1882	Store/single urban elite male	Drinking families 0.01062 Skagway business families 0.54073 Transient males 0.14560 Work camp 0.14517 Brothels 0.11600	Skagway business families: significant, coefficient of 0.54, work camp and transient males: marginally significant, coefficient of 0.14
1883–1895	Family urban elite	Skagway business families 0.68144 Work camp 0.11580 Hotels and restaurants 0.06764	Skagway business families: highly significant, coefficient of 0.68. Work camp: marginally significant, coefficient of 0.11
1896–1910	Elite urban manager's family	Skagway business families 0.47743 Transient working class families 0.10482 Work camp 0.01955 Military 0.02674 Saloons 0.25489 Hotels and restaurants 0.10324	Skagway business families: significant, coefficient of 0.47. Saloons: significant, coefficient of 0.25. Transient working class families and hotels and restaurants: marginally significant with a coefficient of 0.10
1911–1941	Japanese family/laundry and Japanese male group housing	Drinking families 0.6146649 Skagway business families 0.2232255 Transient working class families 0.0113967 Work camp 0.0008159 Military 0.1005929 Hotels and restaurants 0.0441609	Drinking families: highly significant, coefficient of 0.61. Skagway business families: significant, coefficient of 0.22. Military: marginally significant at 0.10

The assemblage has only a 54% correlation with the Skagway business family group, with a 29% correlation with assemblages produced by single males. The family and brothel correlations may in fact be a reflection of the signature of a general store that catered to the domestic needs of several pearling master families who were urban elite. But it should be kept in mind that the main population to which the store was catering was the very large transient male population of pearling divers and masters, therefore the correlation with single males may in fact relate more to the store than the single male occupant.

However, all three elite occupations resemble the Skagway business families group, most closely whether or not they result from a single male occupation or a family occupation. Spude (2006:305) characterizes her Skagway business families as middle class, a definition that could also be applied to the store keepers and managers of the Knight & Shenton store. The business families were more moderate in their drinking habits than the drinking families she examined in which beverage containers constituted a third of the assemblage (Spude 2006:304).

The strongest correlation to this group was from, Fred Pearse's family occupation of the extended store building. The occupation generally has similar percentages of armaments and male-related items as the family group, but less female-related items. The assemblage also had less beverage containers than the family group. However, Spude, because of preservation and timing considerations on some of her sites, does not include bottle closures within her percentage calculations (Spude et al. in press). In this particular assemblage, there were a higher number of bottle closures than there were bottles, so the beverage percentage is underrepresented (Table 9.5). When substituting the percentage of bottle closures for that of bottles, the number is in the higher range of the household collections which make up the Skagway business family group (Spude et al. in press). It does, however, still only represent a fifth of the assemblage, not the third required for a drinking family.

Table 9.5 Artifact percentages grouped for comparison with Spude's predictive method

	1870–1882, N(%)	1883–1895, N(%)	1896–1910, N(%)	1911–1941, N(%)
Food storage	34(8.3)	81(8)	53(6.2)	122(13.3)
Decorated dishes	47(11.5)	166(16.5)	102(12)	61(6.6)
Undecorated dishes	25(6.1)	81(8)	50(6)	36(3.9)
Other household items	54(13.2)	166(16.5)	152(17.8)	131(14.3)
Medicinal	26(6.3)	64(6.4)	40(4.7)	45(4.9)
Beverage containers	70(17.1)	145(14.4)	228(26.7)	285(31.2)
Bottle closures	*73(17.7)*	*220(20.4)*	*184(22.7)*	*358(36.2)*
General personal	54(13.2)	84(8.3)	69(8)	64(7)
Female-specific items	18(4.4)	49(4.9)	47(5.5)	29(3.2)
Male-specific items	15(3.7)	18(1.8)	16(1.9)	9(1)
Tobacco-related items	47(11.5)	65(6.5)	31(3.6)	40(4.4)
Arms and military	6(1.5)	20(2)	26(3)	60(6.7)
Other artifacts	13(3.2)	67(6.7)	39(4.6)	33(3.6)
Total	409	1,006	853	915
Total using bottle closure	*412*	*1,081*	*809*	*988*

The assemblage from the family of C. Moore, the manager of the store for W.D. Moore of Fremantle, has a lower correlation with business families than either of the two earlier assemblages (Table 9.4). By 1892, the West Australian born W.D. Moore was in the highest echelons of the Swan River Colony, being a member of the first Western Australian Legislative Council and a highly successful business man with pearling, timber, pastoral, and mercantile interests. His family therefore represents Western Australian aristocracy in the southwest.

However, C. Moore's family assemblage does not echo such status. Besides having a lower correlation with business families, it has a significant correlation with a saloon assemblage. 26.7% of its assemblage consists of bottles, which is a lower percentage than for saloons and drinking families, but higher than for business families. Except for undecorated dishes, the assemblage also has lower percentages of dishes and household items than the business family group. This may be a factor in its marginally significant but surprising correlation with transient working classes families. This triggers the question: was C. Moore's family actually a lower-middle-class family or do these traits reflect his position as a homeland dependency elite rather than a regional development elite? The answer requires either C. Moore to come out of historical obscurity or other excavations of dependency elite sites to compare to this assemblage.

The last assemblage mixes two different occupations and also incorporates a long period of casual use by fishermen and the occasional use as a battleground for army maneuvers. Weak correlations with 6 of the 11 model assemblages (Table 9.4) are therefore less surprising than the six correlations for the store manager's family. It is also not surprising that the combined uses suggest drinking families more than business families with echoes of working class families, work camps and hotels with the military use showing up as marginally significant. The correlation with drinking families would also be stronger if bottle closures were used as the indicator for the amount of drinking rather than bottles as the layer contains almost a 100 more closures than bottles (Table 9.5) raising the percentage for beverage containers to 36.2%, well within that for drinking families but lower than that for a saloon site. However, given the mixed and extended use of the site, this correlation does not prove that the Japanese family was actually the ones doing the drinking.

It appears significant that the strongest correlations with middle-class status and values as demonstrated by American small entrepreneurs are with the young regional development elite males and their new families who went to the northwest to create opportunities for advancement for themselves in the new land. This correlation with middle-class families was much weaker for the homeland development elite family, despite them possibly being associated with the upper levels of Western Australian society. Their regression pattern suggests a higher level of drinking and weak correlations with working class assemblages. Could this also be an indication that the collapse of regional resistance to homeland domination was reflected in fewer surpluses being left in the region and perhaps a weaker adherence to keeping up middle-class values?

Walker, after an extensive study of a working class neighborhood in Oakland, warns that mass production, mass consumerism, and the growth of national and

global distribution networks in the later nineteenth century "left most people with seemly 'middle class' assemblages" (Walker 2004:217) and the differences of class and status were in the types and amounts of things rather than their quality (Walker 2004:201).

The Cypress Freeway Project (Praetzellis and Praetzellis 2004) allowed researchers to examine patterns across an extensive range of privy deposits which could be connected to particular families, houses, and social statuses. This allowed them to look for statistically derived patterning such as the residents of the largest and most expensive housing type in their sample having an absence of hard liquor bottles in their refuse. The consumption of wine and champagne was economically linked with professionals drinking most and unskilled laborers the least. Fainter patterns were found showing greater consumption of beer/ale by skilled workers and that of hard liquor by both skilled and unskilled workers as opposed to professional and wealthy professional households. Cost is not the sole arbiter of these patterns as hard liquor is expensive and Praetzellis and Praetzellis infer that each type of alcohol had symbolic meaning as "symbols of class identity and sophistication" (2004:318). However, the type of meat you ate was correlated more to the type of house you lived in than to your profession or ethnicity, and surprisingly, if you rented the house you were more likely to buy expensive meat than the owner (Praetzellis and Praetzellis 2004:318). Since all my assemblages came from the occupation of the same house, detailed examination of variation in meat cut is therefore unlikely to be a profitable line of research, while examination of alcohol consumption could be useful.

While the Cypress Project found correlations with who did or did not recycle, this is not a line of research that would show results in the northwest. There were no conventional recycling opportunities in the region and the evidence of unconventional recycling by using bottles as garden edging and even walls and floors of buildings has been destroyed by bottle hunters leaving only the knowledge that such uses existed but not the extent of the practice.

Researchers were also able to measure ceramic tableware complexity across households, assuming that the degree of participation of the household in the Victorian ideal of ritualized dining was reflected in the number of different types of ceramic tableware (Praetzellis and Praetzellis 2004:320). They argue that the working class families within their area brought "above their station" as a form of resistance to a class-ridden social ideal that sought to clearly differentiate people into social class groupings by "means of symbols encapsulated in material culture" (Praetzellis and Praetzellis 2004:321). Interestingly, the research found a very strong correlation between African American households connected to the job of railway porter and the display of middle-class values. They ate well, including expensive meat cuts, dressed well, and dined using formal fashionable table settings and fashionable household settings. The quite strong correlations from these households are interpreted as using material culture as "symbols of civility and personal dignity" as a form of resistance to a racism which denied they processed such qualities (Praetzellis and Praetzellis 2004:2800).

By listing the types of vessels discarded by his four groups of skilled U.S, unskilled U.S, skilled immigrant, and unskilled immigrant into a table, Walker (2004:233) shows that all his households owned teapots, saucers, cups, platters, dishes, plates, tumblers, stemware, and pitchers/jars and he concluded that the table gives "an idea of what the basic table settings would have commonly contained" (Walker 2004:234), which were then elaborated on for the Victorian ideal. Brooks (2005) warns that ceramics found on American sites and those found on sites within the former British Empire are not likely to be similar; citing the work of Lawrence (2003a, b) and Klose and Malan (2000), he identifies there is a "'British pattern' of colorful decorated materials in the years after 1850, as opposed to the American pattern of lightly decorated materials" (Brooks 2005:56). With this in mind, extracts from the Feldheim, Gotthelf & Company mail order catalog of 1905 (Cuffley 1984) have been used to identify the range of forms available to Australian purchasers at around the turn of the century for Table 9.6 in case difference extended to form as well as decoration. The catalogue elaborates on function for plates of various sizes which may not relate to their actual function within a household, for example, a pudding plate with diameters of 18–19 cm could have well have been used as a dinner plate rather than the slighter larger 20–22 cm plates, but it does give a good idea of the range of variability which could have been chosen and that which was chosen.

Walker (2004:329) warns that there is a strong correlation with the size of the assemblage to the richness of the assemblage (number of vessel functions) and this factor would certainly be working at the Knight & Shenton store site as the assemblage is not from a privy collection but broken items and discards across the yard areas around the house. Therefore, artifact numbers are higher and so are minimum vessel counts and number of forms present. However, he still sees a strong correlation between the socioeconomic status of his groups and number of vessels and forms present within each group. He found skilled U.S.-born workers households discarding more vessels and more forms of vessel with levels of each dropping through the groups to the unskilled immigrant group which had the least of both.

This pattern is not quite followed by the Knight & Shenton store site where forms peak at 21 and remain so over the 3 largest assemblages with MVCs of over 100 (Table 9.6). This included the mixed unskilled/skilled immigrant occupation of 1910–1941. The concentration on vessel form and function within this analysis avoids the majority of discards from the casual postabandonment use of the site by fishermen and campers as these discards are heavily biased towards bottles, food items, and activity-based items associated with fishing and travel. However, campers and fishermen clearly ate at least some meals on the site and therefore the results for the unskilled/skilled immigrant group from this site are not reliable.

What is interesting about Table 9.6 is what it says about activities on the site and what a basic northwest dining assemblage consisted of. The Knight & Shenton households all owned teapots, saucers, cups, mugs, platters, dishes, particularly large and medium bowls, plates, condiments, tumblers, and stemware. This is quite similar to the basic American functional forms. If the first assemblage is disregarded because it contains lesser evidence of on-site dining, the basic dining pattern appears to be three sizes of plates, meat and vegetable serving dishes, both serving

Table 9.6 Ceramic forms per household

Vessel function	Owner/store	JNR. partner	Store manager	Japanese workers
Dinner plate 20/22 cm	3	1	3	6
Pudding plate 18/19 cm	–	16	10	6
Cheese/dessert/side plate 14/17 cm	–	25	8	3
Soup serving plate	–	–	–	–
Meat dish/plate	2	8	9	4
Gravy dish	–	–	–	–
Vegetable/serving dish	3	1	3	1
Sauce tureen	–	–	–	–
Soup tureen	–	1	–	–
Serving bowl	2	5	5	2
Gravy boat	–	–	–	–
Comport	–	1	1	–
Desert bowl	4	8	8	2
Cruet	–	1	–	–
Candlestick	–	–	–	–
Knife rest	–	–	–	–
Spoon holder	–	–	–	–
Dish cover	–	–	–	–
Stemware	16	54	49	19
Tumbler	13	31	24	22(4 mod)
Shot glass	–	–	–	–
Decanter	–	–	–	–
Jug	–	3	6	1
Ice pail	–	–	–	–
Ice tongs	–	–	–	–
Cutlery	1	–	1	5
Serving cutlery	–	–	–	–
Flower stand/vase	3	4	4	–
Pickle frame	–	–	–	–
Condiment/pickle jars	4	9	6	7
Cup	18	51	38	20
Mug	1	10	8	2
Saucer	14	31	24	20
Tea bowl	2	6	4	4
Teapot	–	3	–	14
Coffee pot	–	–	–	–
Milk jug/creamer	1	–	–	–
Sugar bowl	–	4	1	2
Kettle	–	–	–	–
Kettle heater	–	–	–	–
Teapot stand	–	–	–	–
Teapot tray	–	–	–	–
Round waiters	–	–	–	–
Butter dish	–	–	1	1

(continued)

Table 9.6 (continued)

Vessel function	Owner/store	JNR. partner	Store manager	Japanese workers
Biscuit dish	–	–	–	–
Butter and cheese dish	–	–	–	–
Fruits tray	1	4	–	2
Fruit/cake basket	–	–	3	15
Egg cup	–	–	–	–
MVC	88	275	215	133
Form	16	21	21	21

and eating bowls, condiment containers, jugs, stemware, tumblers, cups, mugs, saucers, sugar bowls, and teapots.

The first assemblage is heavily biased towards drinking, both hot (42%) and cold (33%) beverages, with fewer dining items (25%). Very little of this assemblage is associated with the southern side of the store building near the store warehouse, so it is unlikely to be heavily biased by store goods as opposed to goods used by Farquahar McRae, the senior partner in McRae & Co. The assemblage suggests that while McRae did eat within his backyard area and certainly drank in both the back and side yards, he did most of his eating off site and therefore did not display the full basic dining assemblage that the other occupations did. However, when he did entertain, he included flowers on his table, but the evidence suggests afternoon teas and social drinking rather than dinner entertaining.

The second occupier of the site was also a partner in McRae & Co, but by 1883 Fred Pearse had been married for at least 6 years. His assemblage is also dominated by drinking hot beverages (48%) and cold beverage (32%) (Table 9.6). His dining component is actually less than McRae's at 20%, but his dining assemblage is more varied with 12 forms associated with dining rather than 8 suggesting the family did set a dining table. The Moore family had an almost even split between drinking hot (40%) and cold (36.7%) beverages and a dining component lying in between the early assemblages at 23.3%. However, this percentage included eleven vessel forms. The mixed working class immigrant and casual use assemblage had 33% cold beverages, 42.2% hot, and 24.8% dining with nine vessels forms associated with dining.

When compared to the Oakland privy assemblages, these percentages are very different. Across the board, all the Oakland assemblages had the dining component as the greatest percentage varying from 40% for the unskilled immigrant group to 55.5% for the skilled U.S group. Both U.S.-born groups had over 50% of their privy assemblages as dining-related materials. These differences may not be cultural ones but archaeologically derived as the majority of the American material is deliberately discarded into a privy, while the majority of the Knight & Shenton site results from breakages while in use.

To test whether discard pattern was a factor, the material from eight privy deposits from the Australian "Big Dig" in the "Rocks" area of Sydney were used to construct Table 9.7. The "Rocks" was an Australia working class area derided as

Table 9.7 Comparison of Oakland and Sydney privy assemblages

	Dining (%)	Tea (%)	Drinking (%)
Oakland Privies by household group			
Skilled U.S	50.8	38.9	20.2
Unskilled U.S.	55.5	25.9	18.5
Skilled immigrant	41.2	35.3	23.5
Unskilled immigrant	40	42.9	17.1
Australian Big Dig Privies by house			
Cara 001	42.9	46.4	10.7
Cara 003	38	42.5	19.2
Cumb 122	38.3	42.5	19.2
Cumb 126	40	53.3	6.7
Glou 093	38.2	47	14.8
Glou 097 (1)	36.6	41.5	21.9
Glou 097 (2)	35.8	50.6	13.6
Glou 101	52.9	35.3	11.8

a slum by more affluent Australians and reformers of the time. It is therefore quite similar to the Oakland area, both in historical household makeup and archaeological context. However, the Australian researchers, while identifying associated houses and occupants, have not been able to associate their privy material with particular households occupying the houses (Crook et al. 2005). The privies selected for Table 9.7, however, date between ca. 1850 and 1907 when the area was connected to a sewerage system.

Only three of the eight privy deposits are similar to the American examples in having between 40 and 55.5% of their deposit relating to dining and there is only one match to the U.S.-born examples of over 50%. However, all were higher than the Knight & Shenton Store site assemblage percentages of between 20 and 25%, suggesting that dining materials were selectively deposited in privies and drinking-related items may have been disposed elsewhere. Therefore, Table 9.7 is more directly comparable to Walker's Oakland privy assemblages than the store site as this difference in discard practice does not come into play.

The privy deposits from the "Rocks" are all from immigrant families with a mix of skilled and unskilled occupying each house. The Oakland skilled and unskilled privy deposits are almost entirely from Irish households, while those of the "Rocks" are from British households, including Irish. Both areas have a faint Portuguese component. They are therefore very similar in origin being almost entirely from working class British-born households. They are also similar in consistently having a lower dining component and a higher tea component than U.S.-born deposits with only one Australian deposit echoing the American-born pattern (Table 9.7). This pattern is also what is found at the Knight & Shenton store, where the bulk of artifacts comes from primary deposits, but it is more extreme suggesting this pattern may be stronger than what the secondary privy deposits suggest. The overall patterning suggests that the "British pattern" of ceramic decoration also flows through to a "British pattern" of functional use associated with the consumption of food and drink, which has a higher emphasis on tea drinking than dining.

Table 9.8 Comparison of alcohol types across assemblages

Knight & Shenton store site	1870–1882	1883–1895	1896–1910	1911–1941
Bottles				
Alcohol	2(9.2%)	3(8.1%)	11(15.3%)	24(21.6%)
Beer/porter	7(31.8%)	14(37.8%)	49(68%)	75(67.6%)
Wine	13(59%)	14(37.8%)	12(16.7%)	8(7.2%)
Soft drinks	0	6(16.3%)	0	4(3.6%)
Closures				
Alcohol	3(8.8%)	13(10.5%)	29(18.5%)	6(3%)
Beer/porter	26(76.5%)	98(79%)	78(49.7%)	145(71.4%)
Wine	5(14.7%)	10(8%)	49(31.2%)	50(24.6%)
Soft drinks	0	3(2.5%)	1(0.6%)	2(1%)

The Cypress project has also allowed researchers to research alcohol consumption across their households. Owen (2004:G.1) found a strong correlation between wine bottles and wealthy professionals with the number of bottles dropping through the categories to be least in unskilled households. He also found a weaker correlation between beer drinking and skilled workers and the consumption of hard liquor by both unskilled and skilled workers (Owen 2004:G.1). These findings were based on bottle and bottle fragments found in the privies. The "Big Dig" privies cannot be directly related to Owens's findings as the researchers counted wine and beer bottles together. This was because of the difficulty of determining whether a black or green glass bottle held wine, ale, or porter. However, Table 9.8 shows the bottle glass and bottles from the four Knight & Shenton store site assemblages in a way that allows direct comparison to Owens's research. As suggested by his work, the two assemblages identified as having strong middle class and business ties have more wine than the homeland elite family identified as having weaker correlations with middle-class families and some correlations with working class assemblages.

Table 9.8 also shows that identifications based on bottle glass may be misleading. The hot dry sand in the Pilbara has made excellent preservation conditions for bottle closures, including the fragile lead bottle sealing capsules so common to nineteenth-century household use. The sites yielded 88 different types of marked lead bottle sealing capsules (Nayton 1992b), 14 types of foil bottle sealing capsules, and 10 types of metal bottle closures. As most of the closures have marker's marks identifying the contents of the bottles they sealed, they form another, more precise, form of identification of bottle content. Using the bottle closures makes a dramatic difference to the balance of wine, beer, and spirits within the households, with beers, ales, and porters showing strongly as the tipple of choice across all of the assemblages.

Public and Private Display

As the Knight & Shenton assemblages are largely from primary use contexts outside of the walls of the main dwelling, it is possible to look at the use of yard space as a negotiation of social identity. Chapter 8 identified that the occupants of

the site used their yard space a little differently; this section will examine the material culture used in the important yard spaces across the site to see what the occupants were stating about themselves and their position within society.

Within this analysis, it should be kept in mind that all the assemblages are ultimately being derived from the same pool of material culture available to residents of the northwest. In particular, the first two assemblages are from partners in the same store and would have drawn their material culture from that source and its overseas trading network. The last three occupations derive from two different store owners and some sources of supply may have changed because of this; however, as they were selling to the same buying public, stock would not have changed dramatically although actual sources of supply might.

When the site was first built, its orientation was different to the later occupations. The store was oriented to Pearl Street with a warehouse further down the street towards the landing. The outbuildings were concentrated on the side of the building away from the landing with two to the rear and one thought to be a bedroom/office space to the side. The site was occupied briefly by either Knight or Shenton, then in early 1872–1875 Farquhar McRae occupied the site as a branch store and home. It is not known if the site was also occupied between 1875 and 1883; however, Fred Pearse's family is the most likely occupant of the extended house. It is less likely that Mrs. Pearse lived in the combined store/house with its lack of an on-site kitchen.

The single men who are known to have occupied the building during this period concentrated their use in the area of the outbuildings to the rear and one side of the store. The ceramics in this area change from tea service items between s26 and s29 to storage items near outbuilding one. Tea service items are of several designs with 11 different types. Some cup, saucer, and side plate sets are indicated in plain or gilded white-bodied wares and porcelains with a color scheme that was mainly white, gilded, with green leaves, and at least one pink rose, although both blue and white and brown and white transfer prints and beige slips are also found. The presence of toy tea sets, marbles, and ceramic figurines in the same area indicates the presence of a woman and children and it would appear that Mrs. Hall and/or Mrs. Chapman visited for tea and perhaps some of the "dozen wives" (Inquirer 6/10/75) that were being brought to the port in 1875 had time to take tea with Farquhar.

Occasional dinners were also served with a few shards of plates and serving vessels found along with evidence of oysters, crab, fish, and mammal bone as well as an egg being consumed. Drinks consumed included at least seven ales and porters, one whiskey, and two wines with shards from nine bottles also found. Glassware in the area was evenly divided between plain tumblers and engraved, fine glass stemware with one colored tumbler.

In the area to the rear of the store use activity associated with this occupation did not extend further south than s34, 2 m south of Outbuilding 1. The area contained 43 artifacts, of which 15 were bottles, one was a bottle closure, and three were drinking glasses, meaning 44% of the artifacts related to drinking and 18.6% related to eating meat from medium-sized mammals. The only service wares are a shard from a blue and white transfer printed dinner plate, a shard from a large glass bowl, and shards from a tumbler and a delicate but plain wine glass.

The area appears to be a private area screened from street where functionality rather than display was important. This contrasts with the more open area used to entertain respectable married women taking tea and possibly respectable families at the occasional dinner. Here, display was important and taking tea was especially important. As Lawrence has noted "Achieving the correct appearance for oneself and one's home was part of the construction of self and also a signal to others that beliefs and behavior would be appropriate" (Lawrence 2000:179). Maintaining sufficient respectability in order to entertain respectable women ensured that the McRae brothers continued to be thought of as being the "right stuff," eligible to associate with the highest echelons of northwest colonial society, the Resident Magistrate and his sons (Sholl 1865–1866). The display would have also helped in the competition for the hands of the few unmarried women in the northwest and eligible females in the southwest. The lack of girls in the area was still being bewailed by Edgar in 1884 (Edgar 1884: November 10), but McRae successfully achieved married status in 1878 (McRae 1868–1878: Letter 1878 September 15) 2 years after he had built a suitable home to which to bring a bride.

During the 1883–1895 occupation, by the family of Fred Pearse, the area was used differently. The backyard was shielded from view by a fence running along Pearl Street boundary set on slightly higher ground than street. The area was used as a dining area, but there is very little evidence of specialized social display in the backyard, although all the forms of vessels which appear to make up the dining/tea suite across the three households are present. Of the 149 ceramic objects located across the area, only 15 could be classified as finer delicate wares produced from refined whitewares, porcelain, and ironstone. The ceramics show great variety and little evidence of sets except in plain or glided whitewares with the main decorative colors being split between, green, blue, and brown, but also having vessels decorated in red, pink, black, and flow blue. The food served appears to have been mainly lamb or medium-sized mammal with a strong component of small mammal with one beef bone identified, the only one found on site. However, 38% of the menu was seafood with oysters from the inlet and fish being most common, followed by crab, squid, other shellfish, and a crayfish. This may suggest a smaller component of fine dining and display, which is swamped by a greater proportion of family dining.

Drinking also suggests fine dining with 35 of the 56 drinking glasses being wine glasses, 26 finer engraved, or lead crystal glasses. However, the bottles opened in the area were overwhelmingly ale bottles (31), with some porter (2) and European lager (3) which would have used the plain tumblers also found in the area. Only three wine bottles could be definitely identified from the closures, although five unidentified motifs could have also been from wine bottles and four whiskey tops were identified.

Along with their drinks, smoking was also a socially respectable habit for the Victorian gentlemen and the remains of 29 clay pipes were recovered from this area. Like the rest of the assemblage, the tobacco pipes send out a mixed message with 7 large plain pipes and 13 plain medium-sized cutty style pipes associated with three Dutch style pipes and six decorated pipes. This was the largest number of

decorated pipes found in any area for this occupation, again suggesting an element of display overshadowed by a less public family use.

The family from this period also used two other areas, a yard that was now at the side of the house, shielded from Pearl Street by the bulk of the house and from the sun by a verandah, and the area in front of the house. The side area contained an attempt at flower cultivation and was used mainly for drinking, taking tea, and a small dining component which had a lesser percentage of seafood. From the 14 m^2 excavated within the side yard, shards from 47 bottles and 35 lead bottle sealing capsules were recovered. Again, the capsules suggest that the majority of bottles opened (16) were ale and stout bottles, but there is also evidence for four whiskies, one cognac, and one gin bottle also being opened.

Fourteen of the twenty-two glasses were lead crystal, being both stemware and tumblers and four further glasses were engraved stemware, meaning 82% of the glasses broken within the area were fine rather than plain wares. Six of the twenty-six ceramic vessels, all being tea wares, were also fine and delicate being made of porcelain, ironstone, or bone china and a green and brown color combination was more dominant in the decoration, although variety was still the overriding trait in the ceramics. These items suggest the side area was used as a garden setting for social display which was centered on adults enjoying moderate drinking and having tea, with much less evidence of children than other areas. There was also less smoking in this area and less show associated with smoking, with plain medium and small pipes being the pipes of choice.

This side garden is clearly an adult space used for adult entertainment and social display. Providing a shady garden setting for their guests in a town of sand and shallow well water supplies was a clear statement of the family's social status and their ability to control their environment to provide the niceties of life.

The last area used by the family was the front of the house facing the landing and the Strand, but also very much visible from Pearl Street. The excavated 8 m^2 in this area yielded 32.1 nonarchitectural artifacts per square meter, more than from either of the other areas.

The evidence suggests this front area was also used for social drinking and tea and perhaps dining with nine cups and saucers, six side plates, nine supper plates, and a teapot recovered with evidence of meat and seafood dishes, glass tableware, and ornaments. There was more evidence of sets with three types having three or more items and colors are more grouped with four types of blue and white dishes, five green or green and brown dishes, and three red dishes. There were fewer bottles found in the area, but 60 lead bottle sealing capsules were recovered, the majority of the tops being from ale bottles with one wine and three cognac bottles also opened. Glassware is split between eight pressed glass tumblers, two engraved stemware, and seven lead crystal stemware glasses. Tobacco pipes were mainly plain medium cutty-shaped pipes, but there was also three Dutch-shaped pipes, a pipe made from red clay, and a large "White's Brute" decorated pipe.

There is also evidence of activities such as writing, sewing, and small girls playing with tea sets while enjoying the cool breeze off the inlet, which suggests that the

family was very much on show while enjoying this area. It was a place to see and be seen as a respectable Victorian family group.

The material culture of this family and the way they used it makes it clear that they were at pains to be seen to be living the respectable Victorian ideal with two areas set aside for public display for this purpose and a third area with mixed public and private use where display was only important on certain occasions.

For the Moore family, there was clear division of activities between the kitchen and eastern sides of the backyard and the western side which was clearly used for dining. On the eastern side of the yard and within the kitchen, there is less evidence of men and drinking and more evidence of females, tea service, and cooking, but little actual food remains. Only two of the buttons found in this area are from male clothing, the rest are small shell buttons which could come from a variety of male and female clothes. Only one of the buttons was a fancy button and two were of cheaper materials being bone and abalone, respectively. The tea service items found in this area vary slightly from functional mugs and white-bodied wares, with only a small component of porcelain in the kitchen, to mostly porcelains and fine-bodied wares in the backyard near the verandah. The materials suggest a division of status between women in the kitchen and the verandah and may be showing the presence of servants.

In Cossack, the servants would have been either Aboriginal or Asian. In both cases, they would have been doing tasks ordered by the family and using the family's material culture, therefore their presence within the material culture is almost invisible. However, Aboriginal people had one point of difference which can be picked up archaeologically, they are known to have flaked glass in the same manner as they flaked stone to make tools. A faint trace of this activity has been identified in the Knight & Shenton store site assemblage and this will be used to try to tease out association patterns with other artifacts on the site. However, this research will be the subject of a later paper and will not be reported here.

The west side of the backyard, particularly between s27w8 and s31w8, was used as a dining area. There is less evidence of fine dining with a more restricted menu and seafood only making up 26% of the menu. Porcelain and fine ironstones make up 40% of the dinner service which is a much greater percentage than that of the Pearse family (16.8%) within the same area and for the Moore family assemblage in the side yard, which has only 17.2% porcelain and fine ironstones. The Pearse family did not use the backyard as their main area of public display and the lower percentage of fine wares suggests the Moore's did not use the side yard for this use. But the difference in percentages of fine wares between the two areas as used by the Moore's suggests that the backyard was a main area of status display, but in many respects this display was at a lower social standard.

Clothing seems to be different from the early collections with the main button types being cloth "calico" buttons, ceramic buttons, and some abalone. Although there are only two buttons in the area relating to male clothing, one of the buttons substitutes cheaper iron for brass, leaving the brass as only a thin facing to the front of the item. Other clothing items are pieces of leather, part of a work boot, and a waistband/trouser adjuster. Most are suggestive of heavier work clothing rather

than the "Sunday Best" being worn to dinner. Bottle closures indicate 45.5% of bottles opened were hard liquor bottles with whiskey being the favorite. 46.6% of glasses were tumblers, which given the small size of shards on the Knight & Shenton store site could be from short whiskey glasses rather than tall tumblers, although three glasses were confirmed to be beer glasses.

The side yard area contained a smaller number of artifacts and those associated with table service contained 48% of tea wares. Most were white-bodied transfer printed wares rather than porcelains and fine ironstones. There were still quite a high number of bottle shards, but less bottle closures. The one's present suggest ales rather than whiskey or wine were the main tipples although tea was obviously a dominant drink for the area. Although there was less material culture overall, the food remains were more varied with 35.7% sea food. A piece of jewelry and a couple of jet buttons suggest the lady of the house may have been putting on a show, clothing wise, and there is a lesser dominance of cloth buttons. The male buttons conversely are mostly iron buttons with one pewter and one of the more expensive brass.

The patterns are somewhat contradictory with service evidence in the backyard suggesting fine dining, but other strands of evidence suggest informal private dining. Conversely, the service evidence in the side yard suggests less social display, while other evidence suggests more. There could be several interpretations for these patterns. Perhaps the wife set her family table with finer wares to educate her children in social niceties. Or perhaps the answer is the wife was setting a table for her husband's male friends not other family groups. In the side yard, she may have entertained her friends, while the area also had a joint private family use which involved some lighter drinking in the evenings.

There is a third area used by the Moore family, the very public front porch area. The evidence from this area suggests the parents sat taking in the view and evening sea breezes while drinking, writing, sewing, and socializing, while children played nearby. The ceramics from the area were mostly tea wares, although white-bodied transfer prints dominate and there is evidence of only two items of porcelain. While there are certainly bottles and bottles closures present, they suggest ale was the main alcoholic drink consumed and only one closure from a spirit bottle was recovered.

A brass stud from a man's collar, and brass and gilded trouser buttons, jet beads and pearl shell and abalone shell buttons suggest the Moore family was dressed in their "Sunday Best." Like the Pearse family before them, the Moore family was using the public space of their front porch as a place to see and be seen, a northwest version of the London promenade. The image they are projecting is of a respectable middle-class family, although their material culture in "the types and amounts of things" (Walker 2004:217) suggests a lower level of class and status, which the American studies would suggest is working class (Owen 2004; Praetzellis and Praetzellis 2004; Spude et al. in press), which is at odds with the social status of the Fremantle Moores.

The material culture from the two Japanese occupations is too mixed to analyze in terms of social display within various areas. However, an interesting thing about

the assemblage as a whole is the lack of identifiable Japanese content. There are only 19 porcelain vessels in the whole assemblage making up only 13.8% of the assemblage. Only 4.3% of the assemblage displays Asian motifs and techniques. This is a lesser percentage than the Moore family who have 40% porcelains and fine ironstones in one area, the Pearse family who had 12.4% porcelains and fine ironstone overall, and McRae who had 17.4%.

All four occupants had access to Asian ceramics if they so wished to buy them. McRae lived in a time when the Cossack pearling fleet made regular trips to Asia to collect workers and Cossack, in many ways, had closer ties to Asia than Fremantle. The other three occupations lived through times when the town was connected to both Fremantle and Singapore by a regular steamship service. Yet, both McRae and the Pearse family do not have Asian-influenced service wares; their Asian ceramics were confined to green ginger jars. The Moore's had no green ginger pots, but a number of Asian designs in their service ware. This probably reflected the 1890's rise in interest in Japanese motifs within the British Empire trading network.

However, the Japanese occupants of the house do not show a similar interest in Asian design, despite the Chinatown area of Cossack demonstrating conclusively that such material culture was readily available to them and chosen as a conspicuous point of difference by the residences of that area. Both Japanese occupations are not only in the white-dominated part of the town, they are also after the legislation of the "White Australia Policy" which legalized racial discrimination in many ways. Muramats, the owner of the store and laundry, should not have been able to own a retail store and he certainly should not have been able to operate as a pearling master. In Broome, Japanese businessmen and pearling masters had to work as silent partners with a white man fronting the business, a practice known as "dummying." Muramats was openly operating businesses and openly buying land in the white-dominated part of the town. Such a conspicuous absence of racial origin display by both his unskilled and skilled workers can be interpreted as a desire to keep their heads down and show that they socially fit into the white-dominated part of the town in which they were residing.

Can the Effect of Early Regional Elite Resistance and Then the Collapse of That Resistance Be Traced in the Archaeological Records Left by Households in Cossack?

The above lines of analysis, particularly of the difference between the Moore assemblage and the two earlier assemblages, are highly suggestive of a difference between regional development elite assemblages and that of homeland dependency elite assemblages with a lessening of personal surplus and weaker adherence to being seen to be displaying middle-class values linked to the loss of control of the area to outside interests. Such a tantalizing line of enquiry needs to be followed up by excavation and analysis of further sites within the northwest to acquire a large enough pool of data to statically test this across the region.

The effect of the "White Australia" policy on the lives and material culture display of Asian workers across the Northwest is also another extremely interestingly line of enquiry, which can be touched upon at one site but which needs a regional research approach to acquire enough data to smooth out individual variation and expose underlying patterns caused by this major policy that shaped the Australian nation for over half a century.

Conclusions

The focus of this volume has not been just to introduce to the world the historical archaeology of Western Australia. It has been to use the history and archaeology of the state to study the systemic patterns imposed by market capitalism in a situation where geographical inertia does not come into play. This has been studied at a landscape level, town levels, and site level.

At a landscape and town level, the overwhelming role of transportation and the control of the transportation network in shaping the new land is evident. Where people lived and what they grew or made could be directly linked to economic distance from, firstly, the London market, and secondly, the Perth consumer market. The settlement system developed as a k-4 transport-dominated system with a secondary k-7 administrative component with town layout dominated by bid rent values centered on transportation. The agricultural system and the social system which grew out of it were based on regional specialization linked to distance from sea and river transport. Even the West Australian convict system was not primarily a system of punishment, but was a support system for the production and transport of raw materials to the London core.

Western Australia therefore developed a strongly dendritic system of transport, settlement, and agriculture in which trading routes were arranged firstly for the benefit of London based shipping and secondly for Fremantle-based shipping. A process of port hinterland theft firstly benefited the Perth/Fremantle entrepôt over other southwest ports and then, with the advent of a regular steamship service, robbed all Western Australian ports in favor of Singapore and London.

British interests secured control of all goods flowing out of Western Australia by firstly initiating a price war and economically punishing Australians who tried to ship elsewhere to force independent Western Australian shippers out of the market. They then joined forces with their remaining rivals forming a shipping conference to fix freight rates at an artificial high. Thus, through the steam ship service, British interests were able to completely dominate control of surplus out of Western Australia and pass all the costs of transport onto Western Australian producers. A situation of complete domination which existed until 1912 when the Scaddan labor government, recognizing the damage this was doing to the Western Australian economy, took over the steam ship service.

Scaddan led a reformist government which took over the service as a strong move of resistance to forces which were known to be crippling the Western

Australian economy. His reformist government set up a number of other state trading concerns as part of moves to help the Western Australian economy, its workers, and as part of an ideological stance which saw "state socialism" as a way out of the state's woe's. The resistance of his premiership was brief (1910–1916), but quite speculator in its breadth of undertaking.

His resistance, however, came much too late to save the regional development elites of the northwest. In an early adaptation to high freight rates, they developed systems of labor bartering between elites and indigenous labor based on half rations to cut production costs to survive. However, after losing their main economic staple of pearling to a London takeover, they lost the ability to resist high freight rates which had been provided by a northwest based fleet. The artificially high rates then established by the shipping conference marginalized their secondary staple of wool too far for their former adaptations to help them bear the cost. They therefore lost control of the pastoral industry to southwest elites and became a region of managers.

The result of this loss of control was an extreme dendritic system with dedicated specialist ports controlled by outside interests and a severe lack of central place services not associated with channeling surplus out of the region. This situation still plagues the Pilbara, despite it being the "powerhouse" of the Australian economy. Despite the millions being taken out of the region annually in raw materials, the 2% of Western Australians (39,282) living in the Pilbara are not enough to sustain a department store, while in Snohomish County, Washington, only 1,083 are needed (Berry 1967).

A less extreme but still severe dendritic pattern can be seen in the southwest, the economy of which is also still heavily dependent on raw materials including agricultural products. The pattern can be seen in the settlement system, which consists of one sprawling entrepôt, one settlement, which would be considered a town by English standards and all other settlements still being the size of a hamlet or English village, and a transport system focused on facilitating exports and not the movement of people. It can also be seen in the relatively small population as compared to the eastern seaboard, the levels of central place services not focused on facilitating imports and exports and the level of cultural activities such as art, theater, and musical events available to the population. Culturally, it can be seen in the mind-set of federal politicians and other Australians that Western Australia still has a semiperipheral status within Australia, despite the importance the state now has to the Australian economy. And ultimately, it can be seen in the mind-set of Western Australians conditioned to love their state, but duck their heads as terms like "Cinderella" state and "Dullsville" are bandied around. Aware they live in a wonderful place, but painfully aware that it is unappreciated. Conditioned to believe the wonders of Western Australia are all natural and that they have achieved nothing really worthwhile since Stirling landed his ships in 1829.

Therefore, despite the well-known focus of market capitalism on the worker as market with its attendant rise of consumerism and material accumulation by households, the patterns left in the Western Australian landscape echo the extreme drainage patterns of unopposed industrial capitalism. However, unlike industrial capitalism, market capitalism did and does leave a high portion of surplus in

regions in the form of wages. Western Australians are relatively well-off financially with a cost of living below that of Sydney and Melbourne and wages that are generally reasonably high. Western Australians do not tend to see themselves as poor cousins in this regard, which is an interesting difference in perception.

The truth behind the perception requires study of the material culture of households. However, the material life of the two Western Australian colonization events could only be looked at through one Western Australian site due to the lack of major excavations undertaken in Western Australia. There is a limit on the conclusions that can be drawn and the questions which can be asked from one site; however, the Knight & Shenton store site supports an active participation of a marginal regional population in the consumption of British-based mass-produced goods.

Comparison to earlier American sites arising out of industrial capitalism showed little similarity to the Knight & Shenton store site or First Government house in Sydney. Comparison to sites of a similar date arising out of the push westwards across America and from the "Rocks" in Sydney showed many assemblage structural similarities. The balance of functional classes within these sites was more similar to each other than to sites within the early American colonization, particularly in the balance of housing and personal groupings to the other groups. This change in the functional balance of assemblages is obviously a pattern left by the change in capitalism to focus more on the worker as a market leading to personal material accumulation.

However, the extreme variety within the Knight & Shenton assemblage while signaling active participation does not signal a strong degree of control. All the occupants were connected to a store in some way, either directly as owners and managers or indirectly as nonretail employees of the owner. The store was part of the main retail outlet for the whole northwest for a number of years and for the Pilbara for most of the period of site occupation. The site occupants then had clear access to the range of goods available in the region. If anyone in the northwest had control of what was on offer, it was the store partners and managers. Yet, the four assemblages from the site suggest an inability to supply matched sets, certainly of dinner ware, but also of the more portable tea wares. There is such strong variability that it is difficult to see patterns of brand preference for types of ales, spirits, and tobacco pipes, despite all these being marked wares with excellent preservation. It is even impossible to identify dominate color schemes within the ceramics, and certainly, there is very little evidence of matched sets. The assemblages give a strong impression that while they bought well, they had to buy what was there rather than what they wanted. It suggests the northwest was very much an end point where the tag ends of shipments which had not sold elsewhere were sent. It was not quite a dumping ground because the material was new and up-to-date with what was happening in London, but not a favored market.

It would be interesting to see if this same pattern was visible in Asian assemblages from Chinatown. The Asian entrepreneurs of Chinatown initiated a successful resistance strategy of controlling the supply of goods sold to the Asian workers within the enclave cutting out the northwest middlemen like McRae. It could be identified that Chinese and Japanese generally had more successful resistance

strategies within the northwest than other people from southwest Asia or indigenous Australians. This trait if carried on across the country may have heightened the sense of threat these sections of the population aroused in Australians, which led to a series of racially discriminating policies accumulating in the "White Australia Policy" in 1901.

Australia prides itself on being a classless society, but it is not actually classless. It has a small upper class and small lower class and a greatly expanded middle class which takes in most of the levels of society with occupations that would be viewed as both White and Blue Collar in Britain. These people enjoy an outwardly middle-class lifestyle with variations in the amount and type of material culture, much as was found by Walker (2004) in Oakland. However, it appears significant that the strongest correlations with Oakland's working class assemblages come from the Moore homeland dependency elite assemblage. Moore may have been distantly related to a family at the upper echelons of Western Australian society or he may simply have carried the same name. However, what is obvious is that, although he is in a position of trust and responsibility as a petite bourgeoisie, his material culture has much more in common with the working class of Oakland including a stronger association with strong liquor and a weaker adherence to keeping up middle-class values.

The strongest correlations with middle-class values and keeping up appearances come from the young regional development elite males and their families, a correlation which extends back to the hard initial colonization conditions and stays through to the 1892 takeover of both the store and the northwest. Whether a strong middle-class correlation followed by much weaker and lower status correlation is a true pattern associated with the collapse of regional resistance to homeland domination or is just a pattern particular to this site requires the archaeological investigation of more sites. However, the research on this and other questions presented shows the validity of such avenues of research and indicates that there could be a fruitful future for archaeology in Western Australia.

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Index