

Talking Trash: Classifying Rubbish-bearing Deposits from Colonial New Zealand Sites

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ABSTRACT

Archaeological investigations on historic period sites in New Zealand recover household refuse in a variety of regularly recurring contexts. Interpreting the artefact or faunal assemblages from these deposits depends upon a good understanding of the formation processes at play. Here, rubbish-bearing deposits are classified according to form for two purposes: first, as a tool to assist with the analysis and interpretation of archaeological assemblages; and second, to highlight the ways in which their analysis can throw light upon past attitudes and behaviours concerning household waste.

Keywords: New Zealand, historic, refuse deposits, formation processes

INTRODUCTION

Artefact and faunal assemblages are often rubbish, or at least they were to people responsible for their deposition. For obvious reasons, people tend not to discard rubbish in the same place that the artefact was used or the food eaten (Schiffer 1996: 59); even the least slovenly person in the world would eventually drown in a sea of garbage. Instead rubbish is generally removed for disposal, as the alternative of removing people to work, cook or eat elsewhere is not an option for those enjoying a sedentary lifestyle. Disposal practices, like other aspects of cultural behaviour, are patterned, raising the prospect that regularities in the archaeological deposits that they produce can be used to infer aspects of those behaviours.

Historical archaeologists in New Zealand often encounter sizable rubbish-bearing deposits. Occurring in a diverse range of site types, these have considerable interpretative potential that remains largely unexplored. Many of the sites concerned have been excavated under salvage conditions (Smith 2004), constraining the time allowed for excavation and subsequent analysis (Maready 1991: 18). Furthermore, as a recent review (Butcher 2008) has demonstrated, reporting of such sites is often inadequate, providing limited description of depositional contexts. In addition, data from different deposits are frequently conflated. Archaeological evidence extracted and reported in these ways does not lend itself to higher levels of interpretation.

These issues are symptomatic of a wider problem in New Zealand historical archaeology: the scarcity of widely

accepted systems for descriptive terminology, analysis and reporting. The purpose of this paper is to begin addressing this by proposing a classification of rubbish-bearing deposits, as a way of organizing and assessing the quality of the archaeological assemblages they yield. We have constrained our scope to rubbish-bearing deposits in part to make the task manageable, but also because these are the contexts from which the majority of artefact and faunal assemblages derive, and our interest is primarily in constructing an analytical framework within which these can be understood. The classification that we propose draws upon North American and Australian literature, but in presenting it we highlight New Zealand examples to demonstrate its applicability to the local context. We also consider some of the ways in which these deposits might be interpreted in behavioural terms.

FORMATION PROCESSES

As in archaeology generally, interpretation of assemblages from rubbish-bearing deposits, requires an understanding of the formation processes that were involved. Although a wide range of both cultural and environmental processes can influence what enters the archaeological record, and how it may have been modified, depleted or disturbed (Schiffer 1972, 1976, 1996), only some of these are likely to be implicated in the formation of most nineteenth century rubbish-bearing deposits in New Zealand. In broad terms these can be categorized as depositional processes, reclamation processes, disturbance processes, and environmental processes.

Cultural deposition refers to a suite of processes through which human activities cause items to enter the archaeological record (Schiffer 1996: 47), and three of these are of importance here. The most obvious is discard, the deliberate disposal of items. Those discarded

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at their location of use are referred to as ‘primary refuse’, and those discarded elsewhere are ‘secondary refuse’ (Schiffer 1972: 161). Large deposits of primary refuse are uncommon, for reasons noted already, and in general it can be expected that the distance between where people use things and where they throw them away will increase with site population and intensity of occupation (Schiffer 1972: 162). A second important cultural deposition process is loss, where items are accidentally mislaid, producing ‘loss refuse’ (Schiffer 1996: 76). There are two important influences upon loss: the probability that an item will be lost, and the probability that it will be recovered (Fehon & Scholtz 1978). The former is determined primarily by characteristics of the item, with those that are small and portable at greatest risk. Intrinsic characteristics also influence recovery rates, but so too does the locality of loss, with places from which retrieval is unlikely, such as privies and wells, forming artefact traps (Schiffer 1976: 32). Abandonment of a place or activity area by those responsible for the items present there yields ‘de facto refuse’, items that while still usable have been left behind (Schiffer 1996: 89). Factors such as the size, potential for reuse and replacement cost of items will influence their likelihood of abandonment, as will the circumstances in which people depart and the likelihood that they will return, which may prompt curation of items in ‘abandonment caches’ (Stevenson 1982). Additional cultural deposition processes, such as ritual caching and burial of the dead (Schiffer 1996: 79–89) are much less likely to have contributed to New Zealand’s nineteenth century rubbish-bearing deposits.

Reclamation processes occur when places once abandoned are reused, or items deposited into an archaeological context are reclaimed for use (Schiffer 1996: 99). Scavenging or the salvaging of previously discarded or abandoned items may play some part in the depletion of nineteenth century rubbish-bearing deposits, especially where they were exposed on the surface rather than buried in pits or other features. Intact items and those with significant re-use potential, such as construction materials are among those most likely to be scavenged.

Disturbance processes occur when the location and sometimes the form of items in an archaeological context are altered by human actions without the items themselves being used (Schiffer 1996: 121). These can be divided broadly into two categories. Earth-moving processes, where deposits are shifted or removed, result in re-deposition or depletion of the artefact and/or faunal assemblages that they contain. They can vary in scale from the creation of extensive layers of fill to the digging of a small pit or trench. Also included here are maintenance activities such as cleaning night-soil out of a latrine. Surface disturbance processes include trampling and ploughing that can both fragment items and displace them from their original locus of deposition. As with scavenging, these are likely to impact on surface deposits far more than on those deeply buried.

Environmental formation processes include ‘any and all events and processes of the natural environment that act upon artifacts and archaeological deposits’ (Schiffer 1996: 7), and they are too diverse to summarize usefully here. The important point to note is that the impact of many such processes can be closely linked to depositional context. For example, weathering operates primarily upon items prior to burial (Schiffer 1996: 143) and thus is less likely to modify or deplete rubbish that is quickly buried. Likewise, fluvial sorting of items may occur in liquid matrices such as in wells and perhaps in cess-pit deposits.

As Schiffer (1996: 265–266) notes the appropriate unit for the analysis of formation processes is the deposit, ‘a three-dimensional segment of a site... that is distinguished in the field on the basis of observable changes in sediments and artifacts’. Analyses of this sort have been relatively scarce in historical archaeology. Nonetheless important distinctions have been drawn between surface midden deposits and buried feature contexts (Garrow 1984). Among the latter, formation processes in wells (Reitz 1994) and privies (LeeDecker 1994; Wheeler 2000; Crook & Murray 2004) have received much more attention than those in rubbish pits, building foundation trenches or cellar fills. Likewise, there are only a few detailed analyses of midden formation (King and Miller 1987) or post-abandonment recycling (Davies 2002). Where these studies have taken place, they have revealed important differences in the survival and condition of archaeological remains between both rubbish disposal contexts, and varied formation processes (Connah 1986; Staski 1990; McCarthy & Ward 2000).

A CLASSIFICATION OF RUBBISH-BEARING DEPOSITS

Archaeologists have long used classifications to bring order to a set of observations (Hill & Evans 1972), most often at the level of the individual artefact (e.g. Turner 2005). However, decisions about the scale of a classification are arbitrary (Dunnell 1971); archaeological features or entire sites can be classified just as easily. For example, classifications have been proposed for various types of prehistoric sites in New Zealand (Groube 1964, 1970), as well as for features within them (Vogel 2002; Law 2008). To date there have been no systematic classifications proposed at either site or feature level for historic period sites in New Zealand.

The practical and theoretical aspects of classification in archaeology have been discussed extensively in the literature (e.g. Spaulding 1953; Dunnell 1971, 1986; Adams 1988; Adams & Adams 1991). In theory, the act of ‘classifying’ is fundamentally different to the act of ‘grouping’ (Dunnell 1971). Groups are empirical entities, collections of things; classes are theoretical units and as such they must be defined rather than described (Dunnell 1971; Dunnell 1986). Classes, or ‘conceptual boxes’ can be created by stating ‘necessary and sufficient’ conditions for

membership (Dunnell 1971: 45). Groups – units of things – cannot be defined in such a manner; instead, they must be described and are so bound in space and time. However, in reality, the distinction between defining classes as conceptual boxes, and actually grouping things into units, is blurred. Relevant variables, and the attributes thereof, have to be selected with reference to the body of things to be classified.

A preliminary version of the classification proposed here was devised as part of an M.A. thesis examining the role of fish and shellfish in the colonial New Zealand food system (Butcher 2008). Information about faunal remains was extracted from both published and unpublished reports on excavations at 43 sites, representing 330 discrete features or contexts (Butcher 2008: 40). A subset of 113 features/contexts from non-Maori sites, with a secure nineteenth century age and quantified faunal samples of sufficient size for comparative purposes was used in developing the preliminary classification (Butcher 2008: 40–46, Appendix v1). It is recognized that the study dataset did not include the full range of potential rubbish-bearing deposits, and the classification is expanded here to broaden its applicability.

Three broad criteria that can be applied across the range of rubbish-bearing contexts are used to define the principal divisions within the classification, with further subdivisions within some of these (Figure 1). The first distinction is made between *in situ* archaeological deposits, and those that are clearly re-deposited. Contexts are then divided according to their relationship to a surface existing at the time of deposition, with those comprising a feature dug into such a surface separated from those formed upon one. Contexts are then distinguished by their relationship to a contemporaneous building, with those occurring beyond the confines of such a building distinguished from those within.

Distinguishing characteristics of each class of rubbish-bearing deposit are outlined below, along with discussion of the major formation processes that they are likely to represent.

In situ deposits formed on existing surfaces

Surface Layers are extensive deposits that formed on an existing surface beyond the footprint of a contemporary building. In the North American context they are often referred to as ‘sheet refuse’ and are generally interpreted as the result of ongoing discard onto a surface that gradually accumulated sediment (Praetzelis & Praetzelis 1994: 234). In the preliminary study an attempt was made to distinguish between deposits through which rubbish was more or less continuously distributed and those where it was discontinuous or scattered, but in practice this proved difficult to apply, especially where excavation units were small. Nonetheless observed variations in form may reflect differences in depositional processes. For example Features 1, 2 and 3 at the Chinese Garden site, Dunedin, are likely to be discrete cartloads of rubbish dumped on an intertidal surface at the beginning of a land reclamation process (Middleton 2007: 7–12), while the dense midden of oyster shells and other rubbish forming layer 2 of Area 2 at His Majesty’s Theatre, Auckland, represents a decade or more of discarded debris in the back yard of the Union/ Nevada Hotel (Felgate 1988: 187–188), and Feature 1 Area A at the Farmers Site, Dunedin, a similar period of rubbish discarded over open flax covered ground (Petchev 2004: 8–10). A useful distinction may also be drawn between surface layers that form within urban backyards, sometimes referred to as ‘yard deposits’ (Crane 2000), and those from more open settings such as the ‘throw zones’ outside some of the Chinese gold miners rockshelters in Central Otago (e.g Firewood Creek, Ritchie 1986: 88–89).

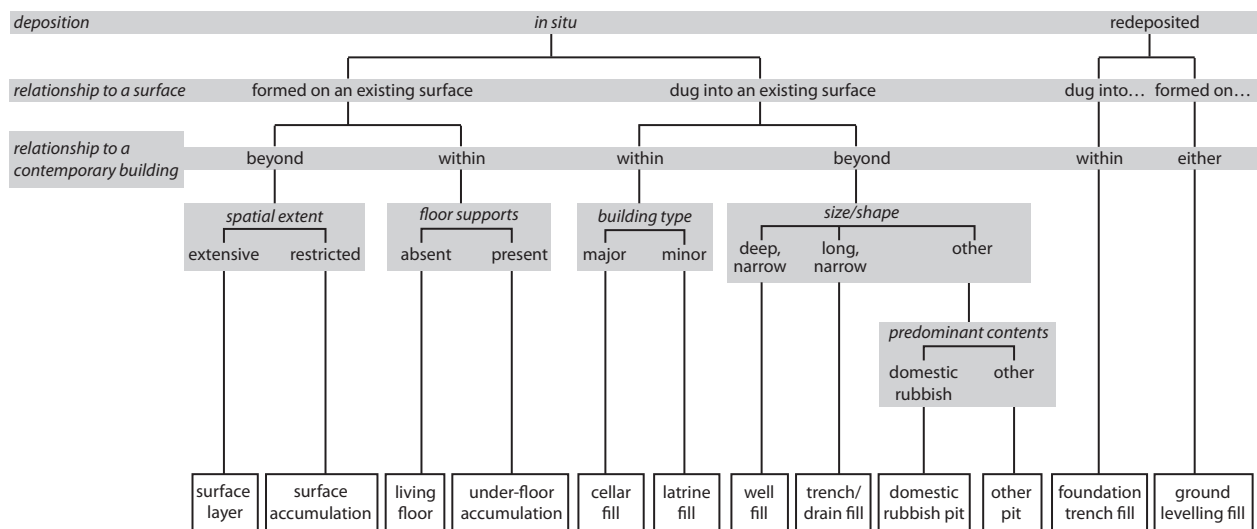


Figure 1: Classification of the main types of rubbish-bearing deposit.

Although the various kinds of surface layers may represent different combinations of formation processes, they share an important characteristic. Because they develop on an open surface, these deposits are highly susceptible to weathering, disturbance and intrusion, which can compromise their integrity. Their utility for archaeological interpretation is enhanced when they have been sealed by a subsequent layer or feature, as with the Farmers site example above or layer 4c of Area 3 at His Majestys Theatre (Felgate 1998).

Surface Accumulations are also deposits that formed on an existing surface beyond the footprint of a contemporary building, but differ from surface layers in that their spatial extent is restricted by topographic features such as pre-existing hollows in the ground surface, or built features such as fences or external building walls. Examples of the former include the main midden at the First Hermitage site (Ritchie 1985: 7), Feature 18/5 at the Alexandra CBD site (Hamel 2003: 41), and the deposits both above and below the stone lining of the Waihorotiu Stream at the Queen Street gaol (Best 1992: 35), while the latter includes material dumped behind the stable wall at the Halfway House hotel (Bedford 1986: 13). As with surface layers they may represent discrete dumping events or gradual accumulations over time, and are equally susceptible to weathering, disturbance and intrusion. However the utilization of pre-existing spaces for rubbish disposal represented by this class of deposits may reflect a different kind of discard behaviour to that which produced extensive surface layers.

Living Floors are deposits formed within the footprint of a contemporary building where there is no archaeological evidence for the presence of structures to support a floor above the ground surface. In many cases they derive from earthen-floored dwellings such as those in Areas 1, 2 and 5 at the Oashore whaling station (Smith and Prickett 2006) or many of the Chinese miners' rockshelters in Central Otago (e.g. Caliche Rockshelter, Ritchie 1986: 91–93). However they can also include examples from wooden or stone-floored structures, as in most of the huts from Cromwell's Chinatown (Ritchie 1986: 97). Also included here are deposits that formed on cellar floors, such as that from the Te Puna mission station (Middleton 2008: 140–142) and both the Phase 1 and Phase 2 floors in the cellar of the Victoria Hotel (Brassey & MacReady 1994: 35). In all cases the essential characteristic is that the rubbish-bearing deposit formed during occupation, rather than subsequently. Because living spaces are often cleaned, it is likely that items will have been incorporated into living floors mainly through accidental loss, or when abandoned at the cessation of occupation.

Under-Floor Accumulations are deposits that form on the ground surface within the footprint of a contemporary building and are distinguished from living floors by the

presence of archaeological evidence for structures to support a floor above the surface. They are sometimes referred to as 'sub-floor deposits'. Reported examples include the deposits under both the house and cottage at John Martin's House site, Hokianga (Grouden 1992, Smith n.d.), and beneath the Westney Farmstead, Mangere (Campbell and Furey 2007), but they appear to be relatively scarce in New Zealand. Exactly why this is the case is not clear, as they are widely reported from nineteenth century sites in Australia, although relatively rare in North America, perhaps because cellars are more common there (Casey 2004: 33).

One of the main modes of rubbish accumulation in these deposits is the accidental loss of small items through gaps and holes in the floorboards and between floorboards and walls. As Casey (2004: 34) notes this is likely to have occurred mostly through butt-boarded floors, and declined in frequency with the introduction of tongue-and-groove flooring. Where there was access to the under-floor cavity, deliberate discarding of rubbish or storage then abandonment of items may also have contributed to assemblage formation. In addition there may also have been accumulation by rats, cats and dogs.

***In situ* deposits in features dug into existing surfaces**

Rubbish-bearing deposits frequently occur within features that have been dug into the ground surface, generally as a fill that has either accumulated or been dumped as one or more filling event. Distinguishing between various feature types is influenced by their relationship to a contemporary building, the presence or absence of lining, size and shape, and sometimes their contents (Figure 1). However it is difficult to define 'necessary and sufficient' criteria for these with great precision, and in any specific case identification depends upon inferences drawn from archaeological observation.

Cellar Fills. Cellars, by definition, sit within the footprint of a contemporary building, forming a space for occupation or storage below ground level. They typically occupy all or a significant part of the underfloor space of a house or commercial building. Depending upon the matrix into which they were excavated, and the level of investment by their constructors, they may have lined walls and/or floors. Because their purpose is to provide a space for occupation, cellars are backfilled only when they cease to be used. This may occur through gradual decay of the superstructure and natural sedimentation, or as a deliberate process. The frequent presence of debris from building demolition, as was the case at the Victoria Hotel, Auckland (Brassey & Macready 1994) and the Te Puna mission station (Middleton 2008: 140–142), suggests that the latter was common on New Zealand sites. Other rubbish within cellar fills is generally considered to be material redeposited during clean-up or demolition.

Latrine Fills. The term latrine is used here to encompass 'long-drop' pit toilets, cess-pits, earth closets and other in-ground sewage repositories. In most nineteenth century New Zealand settings these were contained within a building, commonly an 'out-house', although sometimes attached to or within the rear of a dwelling. The insubstantial nature of many such structures means that their foundations do not always survive archaeologically, so that their identification relies largely on the characteristics of the subsurface pit. These exhibit considerable diversity in size and form: long-drops are generally narrow and deep, although usually not extending to the water table; cess-pits are typically wider than their depth; and earth closets sometimes shallow pits lined with a barrel or can (Hamel 2004). Both long-drops and cess-pits have been reported unlined or sheathed with brick, stone or wood.

Latrines are designed to be filled gradually, and therefore could accumulate rubbish during use, either through accidental loss or deliberate discard. However periodic removal of night soil was a common practice (LeeDecker 1994), especially in the shallower varieties of latrine, making it likely that rubbish accumulated during use would also be removed or at least depleted. The more usual interpretation of rubbish-bearing latrine fills is that they formed when the feature was no longer in use for its original purpose and became a convenient location for refuse disposal, either through gradual accumulation or discrete dumping episodes (McCarthy & Ward 2000; Crook & Murray 2004).

Well Fills. Wells were generally located outside contemporary buildings. They had to be deep enough to have reached the water table at the time they were dug, with most of the examples noted in the preliminary study ca 5–6m, with diameters of ca 1m, although examples almost twice that size are known (Young 1988). Linings of bricks, timber, barrels and combinations of these have all been reported, as have unlined examples. Although they have seldom been reported from New Zealand archaeological sites, we also include here cisterns, in-ground tanks for storage of water, which require an impervious lining to fulfill their function. Both these types of feature are intended to remain open during use, and when no longer required may be capped or backfilled. Well fill deposits can sometimes be subdivided into material that accumulated during use, and that dumped into it subsequently (Hall *et al.* 1990).

Trench/drain fills. Long narrow features dug into the open ground around nineteenth century buildings can generally be categorized as drains, ditches or trenches, with the latter including various styles of in-ground fortifications on military sites. All of these were intended to remain open to serve their intended purpose, so rubbish accumulating through discard or loss during use is likely to have been removed by periodic cleaning, and accumulated only at the cessation of use-life. Rubbish may also have been de-

posited when such features were later infilled. Distinguishing between these two components of trench/drain fills is sometimes possible through differences in the fill matrix, as was the case at Fort Ligar (Smith 1989:125–129).

Domestic Rubbish-pit Fills. The term 'pit' is used here broadly to include subsurface features of various sizes and shapes that have not already been discussed. Those in which the fill is dominated by household refuse are termed domestic rubbish pits. By virtue of this definition deliberate discard is likely to be the predominant depositional process, although as Best (1998: 125) has noted, this might have occurred gradually over a period of time or as a rapid event.

Other Pit Fills. Pits in which domestic refuse forms a minor component include a diverse range of features such as sumps, ash pits, animal burial pits, garden features as well as pits of unknown function. An equally diverse range of processes is likely to have contributed to their formation.

Redeposited contexts

It is not uncommon to find rubbish in contexts where the matrix and its contents have been shifted from their original place of deposition. This imposes constraints on interpretation of household consumption and rubbish disposal patterns, and such deposits are considered here only briefly. While there may well be others, two of the contexts most commonly encountered are the materials used to re-fill foundation trenches or posthole pits after construction, and those used to build up or level low-lying or uneven ground surfaces. For most examples of foundation trench fills it is reasonable to presume that rubbish incorporated during refilling came from the immediate vicinity and derived from contemporary or earlier activity on the same site. This is much less certain in the case of ground leveling fills which may have been brought in from elsewhere.

DISCUSSION

As the foregoing discussion emphasized, rubbish-bearing deposits are seldom the product of a single depositional process, and identifying those that were in operation and their impact is essential to appropriate interpretation of the archaeological record. While some New Zealand archaeologists routinely evaluate formation processes, our examination of more than 300 reported examples indicates that many do not (Butcher 2008). For a large proportion of rubbish-bearing deposits the critical distinction that needs to be drawn is between deposition through gradual accumulation and that which resulted from rapid events. Two broad lines of evidence can be pursued in this regard. Stratigraphic characteristics of the deposits can be indicative. For example thin bands of clean fill in rubbish pits (Best 1998:125) and water-laid sediments in well fills

(Hall *et al.* 1990: 75) are probable indicators of accumulative deposition, while undifferentiated fills are more likely to derive from dumping events. More important, however, is analysis of items within the deposits. A high incidence of weathering on faunal remains almost certainly indicates that they accumulated on an open ground surface, exposed to the elements, and high rates of fragmentation in glass and ceramic artefacts are often the result of trampling (Staski 1990). Conjoin analysis can be used to demonstrate the common origin of horizontally or vertically separated parts of a deposit, sometimes even across stratigraphic boundaries (Wheeler 2000). A deposit with high proportions of near complete or reconstructible vessels is usually interpreted as the result of rapid deposition event (Crook & Murray 2003), while one with numerous vessels represented by single sherds is likely to result from re-deposition of material previously exposed to fragmentation and depletion (Best 1998).

Chronological control is essential if analysis is to extend beyond the individual rubbish-bearing deposit to consider variation in space or time. Historical data on land use, building construction and the like can sometimes provide beginning and/or end points for deposition within a specific context, and also highlight times at which it is more likely to have taken place. For example, the introduction of water reticulation in the vicinity provides a probable beginning date for rubbish deposition in the wells at the Fort Ligar and Sky City sites (Brassey 1989: 62; Young 1995: 231–233), and backfilling of privies is often dated to soon after connection to sewers (McCarthy & Ward 2000; Crook & Murray 2004). Datable items amongst the contents of these deposits can provide a *terminus post quem* for deposition, and where they disclose a wide age range may indicate that this was an accumulative, rather than rapid process.

Comparative analysis of the contents of rubbish-bearing deposits can provide revealing insights into formation processes and, once these are understood, into cultural patterns that lie behind the deposition of rubbish. Underfloor deposits typically represent long periods of accumulation, but spatial analysis of those from seven houses at the CSR site, Pyrmont, Sydney, disclosed a consistent spatial distribution with artefacts much more common beneath the kitchen than other rooms, and particularly in the vicinity of external doors and windows (Casey & Lowe 2000, Casey 2004). In part this appears to reflect sweeping of floors toward the doorway, but more importantly the use of both door and window to light activities within the house. Variations in the content of the underfloor assemblages indicate that occupants of two of the houses were likely to have been engaged in commercial sewing. Numerous studies of latrine fills from United States cities have used stratigraphic observations, conjoin analysis and artefact dating to demonstrate that these features were typically filled rapidly with refuse after they ceased to be used, and are often interpreted as the result of a household

‘clean-out’ (Fitts 1999, Wheeler 2000, McCarthy & Ward 2000). In contrast, the ten cesspit fill deposits from nine houses at the Cumberland and Gloucester Streets site, Sydney, exhibit varying degrees of accumulation during use and subsequent backfill by dumping, with the latter derived in part from refuse initially dumped or stockpiled in the back yard (Crook & Murray 2004, Crook *et al.* 2005).

With written records to draw upon, historical archaeologists have often sought to associate the contents of rubbish-bearing features with a particular building or specific group of people. Indeed, LeeDecker (1994) has argued that acquisition, use and discard patterns must be explored at the level of the household. Using census and other data, Fitts (1999) was able to demonstrate that the ‘clean-out’ deposits in his sample of Brooklyn privy and cistern fills derived from middle-class households, and comparison with assemblages from other households revealed a consistent preference for white granite and plain porcelain table- and tea-wares amongst New York’s middle class in the 1860s, contrasting with assemblages from working class households. Similar interpretations are possible even where deposits cannot be associated with specific households. In the tenements at Five Points, New York, historical data reveals strong ethnic clustering that facilitated identification of material culture patterns that reflect ethnicity (Yamin 2001). Interestingly, Crook *et al.* (2005: 187) highlight difficulties in this kind of analysis in Australia due to limitations in the historical record, and it remains to be seen how far this might also apply in New Zealand.

The behaviours and attitudes that underlie rubbish disposal provide a further interesting avenue for study. Most archaeological investigations of this have focused on urban settings and the emergence of municipal services for rubbish collection. As Crane (2000: 21–22) has observed, when occupants of Washington D.C. were individually responsible for their rubbish in the early nineteenth century, they buried it or left it strewn over their back yards. Organized refuse collection emerged as ideas about filth, sanitation and disease, espoused by health reformers, took hold. This focused initially on removal of ‘night soil’, and by the mid-century extended to ‘garbage’ or organic refuse (food remains and animal carcasses). Only at the end of the century did municipal collection extend to ‘rubbish’ or inorganic refuse. Archaeological evidence indicates that sanitary practices were adopted more rapidly in higher status households, but exceptions to this suggest that there were other factors influencing disposal practices, including variations in use of backyards as social, recreational and work spaces.

It seems likely that most New Zealand cities underwent a parallel trajectory of change. Among the earliest rubbish-bearing deposits from Dunedin are surface layers at the Farmers site comprising refuse that had been scattered across flax-covered open ground (Petchev 2004: 10). This accords with historical descriptions of household

slops, scraps and the contents of chamber pots tossed outside into the mud forming a smelly quagmire, and leading to frequent complaints about 'stagnant sewage-filled swamps, defective drains, putrid meat and stinking piles of decomposing waste' (Wood 2005: 5). In 1861 a manure depot was established at the edge of the city into which cartloads of sewage and other rubbish could be deposited (Wood 2005), but the extent to which these were used cannot be assessed as there are as yet insufficient investigations of later nineteenth century household contexts in Dunedin. Archaeological data from the Chinese Garden site (Middleton 2007) and several others show that from the 1870s industrial refuse was routinely incorporated into the fill used in reclaiming the city's foreshore. By the turn of the 20th century a woman writing to the local newspaper described the 'waste corners of the city in the process of filling up with hundreds of loads of rubbish' (Anon 1900: 55). Her ruminations suggest that this was the product of newly emerging attitudes towards refuse disposal, sanitation and health:

Yes, I am a modern and belong to the onward march of city life. I have read, as becomes the modern woman, the cult of the microbe and the theory of the germ ... and wouldn't – in town at least – have a rubbish heap for worlds. ... Week after week I remind the presiding deity of the kitchen to put out the rubbish tins in time for the dustman, as his cart lumbers down the street (Anon 1900: 55).

CONCLUSIONS

One of the outstanding needs in New Zealand historical archaeology is comparative analysis that moves beyond description of individual sites to consider pattern and process in nineteenth century society (Smith 2004: 260–262). Our attempt to use archaeological evidence as part of a broader study of fish and shellfish in the colonial New Zealand food system was both revealing, in that it showed these foods were considerably less well represented archaeologically than documentary evidence suggested they should be (Butcher 2008: 149–150), but also frustrating, in that so many potentially valuable assemblages could not be utilized because of inadequacies in the way in which they were reported. Two of the primary deficiencies were lack of information about depositional context and formation processes that might have influenced composition of the faunal samples, and the conflation of data from what were clearly different contexts.

The classification proposed here provides a potential starting point for addressing these issues. Although it has been applied here to previously excavated deposits, and may require refinement after field testing, the proposed classification provides the kind of data organization and analysis of formation processes that are necessary if numerous assemblages excavated from multiple sites through the work of different archaeologists are to be used

in producing meaningful regional, national, or thematic syntheses. It may also be useful for determining which assemblages are worthy of greater analytical attention. As already noted, most historical archaeology is undertaken in the contract sphere, where the time allowed for analysis is often insufficient for the size of the artefact and faunal assemblages that are typically recovered. Those recovered from redeposited contexts such as foundation trench and ground levelling fills may not be worthy of the same attention as those from in situ deposits, and amongst the latter those from surface layers and accumulations will generally be more difficult to associate securely with specific households or time frames than those from features dug into the ground surface. Beyond these pragmatic considerations, it is argued here that careful attention to the form of rubbish-bearing deposits, along with the more usual focus upon their contents, provides the key to illuminating rubbish disposal practices, and these are a vital element in understanding the societies that created the archaeological record.

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