

The Dustbin: A Study of Domestic Waste, Household Practices and Utility Services

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ABSTRACT Although an intrinsic part of our everyday routines, the dustbin's role as a mediator of changing waste practices has rarely been considered. As bins become reconfigured as environmental technologies for contemporary recycling programmes, it is argued that they provide a revealing indicator of new waste relationships in society. These emerging relationships are explored by tracing through a number of past and present bin technologies, showing how they represent changing waste meanings, practices and responsibilities. The future of the bin and how adopting a bin-centred approach can help researchers and planners reconceptualize waste 'problems' and so reconsider waste management strategies are speculated upon.

Introduction

This paper explores the history and future of the domestic dustbin in the UK. At first sight, the dustbin represents a seemingly innocent container of household waste. As such it is not an especially interesting subject of study. Despite their innocent appearance, we argue that dustbins occupy a critical position in any narrative of waste management. Being situated at the interface of private lives and household practices, on the one hand, and public health and environmental management on the other, dustbin technologies provide a revealing indicator of waste relationships within society. In describing key moments in the history of domestic dustbins, from the development of the ashpit privy in the late 1800s through the standardization of moveable metal bins in the 1900s to the evolution of contemporary bin technologies, including the 'waste-guzzling' wheelie bin, and the more recent diversification of bins and waste types, we track both the meanings of waste, and the shifting boundaries of its public and private management over time. Put simply, this is a story of increasing specialization and of growing collective, if not public-sector, responsibility. In the 1800s, householders expected to burn most of their rubbish at home. The design and form of the moveable metal dustbin related to the introduction of central heating alongside the demise of the home fire, and to the parallel public provision of waste services. The development of recycling bins and of efforts to differentiate between waste fractions heralds the introduction of a new environmental theme into the narrative of waste management, bringing with it further questions about the division and allocation of public or quasi-public and private responsibility, with waste management now seen as an environmental problem linked with global and national, not just local, health hazards.

We suggest how the social fragmentation of waste management, illustrated by the increasing commercialization of the privatized waste industry and the growing number of different agencies involved, is matched by a further fragmentation of waste itself. Mirroring these changes, we are now surrounded by a range of waste depositories, often of different colours and forms. Each of these bins is moulded by the interests of specific constellations of actors, each contributing to the specification of new types of waste and the re-configuring of waste management activity on the part of households, local authorities, and a range of commercial organizations. Our historical approach allows us to make sense of emerging tensions in the world of recycling and waste management, and to speculate on the future of the bin and its part in constructing and mediating what seem to be increasingly complex relationships between households and the wider social and natural environment. These containers on our doorsteps, kerbsides, or stairwells promise to reframe our everyday waste practices. The question for waste researchers and planners is whether new bin technologies are reframing utility-household relationships in desirable ways, and, if doubts remain, what alternative sorts of bins might be constructed.

The Dustbin as a 'Black Box'

By using dustbin technology as a conceptual framing device, and by putting the bin at the centre of our story, we are able to review changing household practices and their relations to service providers. In this respect, our approach to dustbin analysis has much in common with research which explores the social and cultural meanings embedded in a range of familiar domestic technologies. For example, Cockburn & Ormrod (1993) highlight the organization of gender relationships implicit in the design, development, marketing and use of microwaves. Focusing on the fridge-freezer, Shove & Southerton (1998) provide an historical review of the changing benefits of the freezer, showing how these relate to its establishment as a normal and then necessary device, also illustrating how the freezer locks its users into a range of practices and commercial infrastructures. Likewise, Marvin *et al.* (1997) examine the relationships between consumers, utilities and representations of 'the environment', as embodied and perhaps enforced by smart utility metering. These and other socio-technical analyses show how consumers are 'configured' by the technologies they deploy (Woolgar, 1990) and how specific technologies 'script' (Akrich, 1992) their own use. When applied to the dustbin, such an approach prompts us to think about how the structure and form of the bin 'dictates' household waste practices, and to consider the range of actions and behaviours which different bin technologies prohibit or permit.

Although the bin is worth studying as a scripted technology in its own right, we need to push this analysis a stage further if we are to understand the role of the dustbin as a mediating device positioned between households and public systems of waste management. Our approach to the study of bins rests on two propositions. First, that analysis of dustbin technology tells us something about how people define and manage domestic waste. In keeping with the examples cited above, we argue that the bin is shaped by and shapes contemporary meanings of waste and management strategies. Our second proposition is that the bin represents the gateway between domestic waste arrangements and systems of public provision. For most people contact with the waste industry

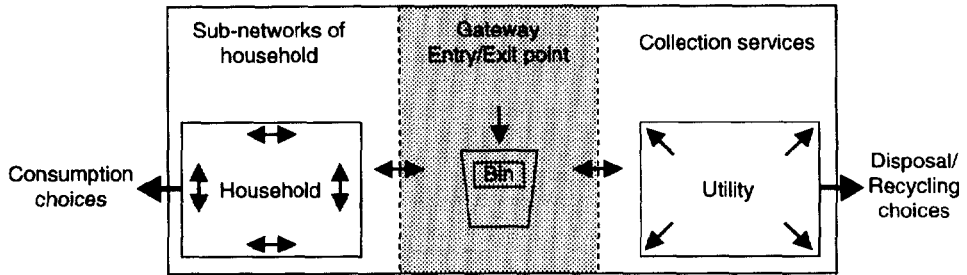


Figure 1. Households, bins and systems of waste management.

begins and ends with the dustbin. As illustrated in Figure 1, the bin is the point at which waste exits the private world of the household and enters the public domain. Bins are therefore doubly structured, being bound into public and private sectors at one and the same time.

Guided by Figure 1, the following analysis ‘unpacks’ critical moments in the last two centuries of domestic waste, attending to the production and definition of different forms of rubbish, to the design of the bin, and to associated strategies of waste management. Before exploring the history of specific dustbin technologies, we need to say a little more about the issues involved.

Household Waste, Dustbin Design and Waste Services

Household Waste as Socially Defined

Household waste comprises those unwanted items that arise in a domestic dwelling: discarded products such as furniture, clothing or toys, used packaging, and food waste. (Waite, 1995, p. 1)

Michael Thompson (1979) contends that rubbish is socially defined and describes how objects have different values, or non-values, for different groups in society. He suggests that to understand rubbish we need to explore the changing relationships between status, the possession of objects and the ability to disregard them. In addition, it is important to acknowledge the shifting economic values of ‘scrap’—what is rubbish in one context can have real economic value in another, with rubbish definitions and associated economics being astonishingly malleable. A long history of informal scavenging activity in the UK bears witness to the differential values in both aesthetic or financial terms which different people have (Campbell, 1996). In any event, the *valuing of things* sets the scene in which rubbish is defined and in which the bin acquires its specific contents. The *valuing of novelty* and the *valuing of durability* are also relevant for they influence the rate at which items defined as rubbish flow into the bin. Weston (1997), for instance, describes how computers consigned to the dustbin in the UK are valued in Dutch schools, where newness is not so highly prized. A parallel feature is, of course, the durability of things themselves and the social and technical rate of, now often *planned*, obsolescence. What goes into the household bin and what stays out also depends on the range of disposal options available and the time and effort people invest in finding new homes or uses for things they no longer need or want. The local secondhand market, the avail-

ability of repair shops, the ability to pass things on to relatives, all influence the rate and range of rubbish passing through the bin.

Although rubbish is usually kept from view, hidden in a back region (Goffman, 1971), part of the ritual of purification and cleanliness (Douglas, 1966), it can also have a certain moral status. For example, Withers (1996, p. 4) describes recycling bins as “conspicuous icons of our environmental responsibility”, suggesting that households may feel morally obliged to recycle just as earlier generations were compelled to salvage waste for the war effort. ‘Waste not want not’, an economy of mending and making do, the immorality of the wantonly wasteful, are set alongside imperceptibly changing conventions of normal wasting practice. Along with Thompson, and with a range of archaeologists and historians, who try and “tell us what we were and how we lived by what we threw away” (White-Hunt, 1980, p. 2), we acknowledge that the definition of what is and is not ‘binnable’ reflects, in part, the values and motivations of particular individuals, households and communities at particular points in time. Such definitions have consequences for the content of ensuing waste streams, for the production of the waste ‘problem’, as well as for the design of the bin itself.

Dustbin Design

The technical capacities and characteristics of the bin, along with its embodied ‘scripts’ or rules of binning behaviour, tell us much about the realm of domestic waste management. In other words, *every bin tells a story*: who are they for, how often are they collected, by whom, and what can and can’t they contain? A reading of modern bins confirms that they are often the property of the waste utilities, being designed to their specifications in terms of size, technical construction and so on. Although the needs of the utility are prioritized, bin designers still have to contend with a range of diverse demands: protecting dustmen from injury, handling ever more voluminous wastes, or resolving the problem of clattering metal lids on early morning rounds. These competing demands have led to a proliferation of bin designs throughout history. During the mid 1900s, Flintoff & Millard (1969) described the design and manufacture of over 20 bins differentiated in terms of material components, capacities, shapes and handles. New design criteria continue to enter the field. One current manufacturer has, for example, over 30 different bin designs for the 1990s home, including waste baskets for easy carrying, mini wheelie bins with telescopic handles for the elderly, and duo bins for segregation (Straight Recycling, 1998).

The size and shape of bin design is also strongly linked to physical layout and character of streets and houses. Specific requirements for handling, transportation and storage in rows of terraced housing, suburban semis, high-rise flats, or dissipated rural properties, influence bin designers’ choices. In the 1960s, many suburban streets with kerbsides saw the rollout of the black dustbin. Elsewhere, plastic sacks were used as a lightweight alternative in communal dwellings. More recently, debates about suitable places for different recycling bins revolve around kerbside and bring systems, with locational ‘pros and cons’ attached to each. As we might expect, bin design also influences associated patterns of use and wastes deposited, by inscribing a number of messages or scripts to the technology. Written rules, such as a request for ‘no hot ashes’ printed on the lid of dustbin, coincide with the introduction of plastic dustbins in the 1960s. Local authorities often introduce further restrictions, such as refusing to collect garden

waste, or only allowing one container of rubbish per household. Large-capacity wheelie bins have become known as waste 'guzzlers' by not only containing but perhaps also encouraging an undifferentiated range of wasting practices (Carter, 1986). More sophisticated bins, for example, bottle banks, represent a combination of scripting practices: signs and colours indicate the proper destination for brown, white and green glass while the shape of the hole makes it difficult to throw things other than bottles into the container.

Configuring Waste Services

A utility's choice of waste collection or disposal service can be seen to both shape and be shaped by the bin and its associated household practices. We have suggested above how the bin is a scripted object, with rules of binning behaviour inscribed in its shape, size and form. In this sense, the waste utilities who specify the design of the bin can be seen as 'creators' of rubbish, jointly dictating along with households what can and cannot go into different receptacles. As such, modes of waste containment reflect particular utility objectives, for instance, limiting service costs by restricting households to one bag of rubbish, or providing paper bins to 'feed' a local recycling plant with whom they have a contract. Conversely, utilities also need to configure waste services to deal with the specific types and amounts of rubbish produced by households in their areas. For waste planners this requires knowledge of what is thrown away and by whom in order to devise service regimes which can deal with the variable 'demands' imposed by the bin's contents. In recognition of this, a 'science of rubbish' has developed since the advent of publicly organized services.

The objectives of such a science reflect different eras of waste and its management in the UK. In the 1960s public cleansing authorities sought to quantify the types and volumes of wastes produced in their regions in order to optimize frequency of collection, team numbers and transport capacities (Flintoff & Millard, 1969). New imperatives have emerged alongside these, with waste disposal authorities of the 1990s seeking information on the contents of household bins as a crucial component of strategic planning, especially in areas where landfill sites are reaching capacity, and alternatives need to be considered. Rubbish analysis has become increasingly sophisticated and a national programme of household waste analysis has emerged. New objectives include finding out about the proportions of potentially recyclable, combustible or compostable materials being discarded, in different locations by distinct sociodemographic groups (Waite, 1995). This information is being used to devise more locally attuned strategies for dealing with waste which take into account both its consumption and production. Regional differences in consumer spending, the products available through local retail outlets, the presence of alternative disposal routes, the type of home heating technology and garden size, are all recognized as important elements in devising waste management strategies (Jones *et al.*, 1998). Just as other privatized utilities, most noticeably electricity companies, have become increasingly interested in how people use their product, so too have privatized waste utilities. The objectives of these organizations, now including public authorities, private companies, environmental organizations, community groups or charities, are diverse. Some may be primarily interested in developing new markets for recycling bins and their contents,

others may be concerned to minimize the household waste stream for environmental reasons, and so target high-volume or hazardous materials.

Rubbish Relationships

In elaborating some of the issues surrounding the bin, we have shown that it is not a purely functional object since it can also be seen as a marker of: the valuing of things, moralities of waste, symbolic significance, environmental responsibility, social organization and much more. With this in mind we now explore the social history of four types of bins, and consider how they frame and reveal different systems of household waste and their 'rubbish' relationships between households and civic authorities.

Moments in Dustbin History

There is a need for storage receptacles to be placed in each inhabited dwelling until such a time as air or water can be harnessed to better deal with waste. (Flintoff & Millard, 1969, p. 14)

In the late 1800s public health legislation first called for bins in every dwelling in the UK, and placed responsibility on civic authorities to service these containers. We begin our bin stories at this point, that is at the moment when rubbish first becomes defined as a 'problem' requiring a collective solution. Our study is restricted to four bin types. In practice different bins and bin relationships co-exist alongside each other, with marked differences in rural and urban communities and different parts of the country. Whilst not an exhaustive or complete history, our selective bin stories nevertheless serve to illustrate diverse and shifting relationships across two centuries of waste management in the UK.

The Ashpit Privy

Ashpit means any ashpit, dustbin or other receptacle for the deposit of ashes or refuse matter. (Maxwell, 1898, p. 7)

Throughout the last century and during the early 1900s ash made up almost all household waste, with unburned refuse representing only a small proportion of household debris and deposited in co-existing dustbins, which were often improvised receptacles provided by the household (Ravetz, 1995). Many ashpits in the 1800s were large and open, being shared by a number of households. We focus, however, on individual ashpit privies or 'tip-up bins' which were commonplace in the terraced streets of northern England up until the early 1900s (Muthesius, 1982). Supported by burning technologies such as the kitchen fire or range, ashes were prepared by the household and taken to the privy situated in the rear wall of the yard (Ravetz, 1995). From here a municipal refuse collector could unlock and empty the ashpit, often on a daily basis. The content of the ashpit was valued in its own right, either as covering for earth toilets, or for use in roadbuilding or brickmaking (Muthesius, 1982).

The organization of ashpit waste services, as interpreted from social histories of terraced housing, recalls a time when waste 'problems' were defined in terms of public health and cleansing imperatives. Households were responsible for burning their own wastes, a process which was widely regarded as the safest

way of destroying noxious elements and rendering refuse inert. The Bylaws, an early form of building legislation, first required the provision of waste service networks along the back streets of new rows of terraced housing on the grounds of public health (Ravetz, 1995). Such arrangements allowed nightsoilsmen to clear out toilet waste from earth closets and municipal refuse collectors to remove rubbish, 'out of sight' of the householders. The small size of the individual privy meant it was frequently serviced. This was not problematic since ash itself had a commercial value as a raw material for the building industry, adding an economic element into the ash waste 'strategy'. By the 1900s, ashpits were under increasing pressure and were no longer capable of handling household wastes. Their fixed location in backyard walls made collection arrangements inflexible, households were increasingly constrained by the 'dry waste only' rule (as new energy sources replaced open coal fires and ranges), and the small capacity of the ashpit made it unsuitable for higher-volume wastes. As the 19th century drew to a close new waste 'problems' and new bins emerged, leaving ashpits to survive only in poorer households (Muthesius, 1982).

The Metal Dustbin

Standard covered receptacles should be used for the temporary storage of refuse. (Flintoff & Millard, 1969, p. 14)

Whilst the origins of the dustbin as a moveable container for the temporary storage of rubbish can be traced to the 1800s, it took until the 1960s for the standardized dustbin to become a reality. During this time the form of the dustbin changed significantly, most markedly in terms of size. Early experiments with small improvised containers such as biscuit tins in the early 1900s gave way to medium-sized galvanized metal bins in the 1950s, and onto larger plastic bins in the 1960s (Warne, 1995, p. 27). During this time the dustbin has seen the demise of both ash and the dust elements after which it was named, with bins containing increasing proportions of higher-volume, lower-density wastes such as packaging, associated with a new household-waste generation. The growing importance of bin mobility is reflected in the dustbin's changing locations, at the kerbside on collection days, but tucked away out of sight for the rest of the week, with most households preferring to locate them in the back region of the house (Ravetz, 1995). Responsibilities for the management of the dustbin 'beyond the store' fell onto public authorities, who usually provided a weekly collection service, although some offered twice-weekly services in densely populated urban areas or fortnightly collection in rural areas. Refuse collectors or 'dustmen' took the bin from household stores to the kerbside, before emptying it into the dustcart, and returning it to the store. Many authorities also introduced their own rules for binning arrangements, such as refusing to collect more than one bin per week from each household. Specific wastes were excluded, meaning, for example, that households had to take their own garden waste to local civic amenity sites or 'tips'.

During the period when dustbins were being established on British streets, public health and cleanliness imperatives continued to shape the organization of waste services, with the management intention of changing the physical characteristics of refuse so that it would be "free from odour, lose its attraction to

vermin and cease to be a danger to health" (Flintoff & Millard, 1969, p. 175). However, household burning was no longer accepted, as air pollution legislation in cities now decreed smoke-free zones, and new centralized disposal solutions were emerging, such as municipal incinerators, or 'landfills' for biochemical decomposition. The shifting of waste management responsibility away from households towards municipalities was accompanied by a growth of waste volumes which gradually began to frame a new waste 'problem'. Alongside the decline of home incineration, household waste practices have been increasingly shaped by the use of more packaging in food, planned obsolescence and disposability. Bit by bit, waste volumes have become a defining factor in the organization of waste services, influencing the size of the bin, and the frequency of services. New service rules represented attempts to defer responsibility for the 'volume problem', for example, as authorities refused to deal with bulky wastes, such as furniture. Dustbin technologies also underwent a period of intense experimentation. Many designs were tried and rejected; for example, metal dustbin lids proved too noisy for early morning collections, and metal bins too heavy to lift. Newer designs opted for easier-to-lift plastic bins or sacks. Attempts to improve and standardize dustbin technology during this time can be seen to reflect wider pressures for strategic reorganization of the waste industry. Long criticized for ad hoc service regimes and inefficient management, waste authorities were struggling to consolidate their municipal responsibility and deliver efficient and relatively uniform services across different areas and housing types.

The Wheelie Bin

The wheelie bin is defined as follows:

A lidded refuse container fitted with wheels. If supplied to households by the waste collection authority, the household is usually required to wheel the bin to the kerbside for collection. (Waite, 1995, p. xiii)

By the end of the 1960s, debates on future bin innovations centred around the use of expendable plastic sacks, which were seen as more environmentally hygienic (Flintoff & Millard, 1969). Few people, at this point, foresaw the emergence of another bin type, the 'continental-style wheeled bin' or 'wheelie' bin. Wheelies were developed in Germany in the 1970s and were heralded as successful managers of municipal wastes, having much greater capacities and flexibility than traditional dustbins. New kerbside arrangements began to emerge, with many waste collection authorities supplying wheelie bins with the proviso that households would take responsibility for store to kerbside transfers. Such arrangements enabled quicker service rounds, reduced physical effort, and required smaller teams of collection 'operatives'. Towards the end of the 1980s, as waste collection services became liberalized, wheelie bins were emerging as the favoured option for waste managers, now working for a mixture of public and private companies. Around this time, reports suggested that the use of wheelie bins was significantly changing both the quality and quantity of waste. A 50% increase in wastes collected from wheelie bins in affluent areas was, for instance, recorded by Carter (1986). This was in part because garden wastes, which had previously been taken by households to civic amenity sites, were now

ending up in wheelie bins, and so in landfill sites along with the rest of the household rubbish.

In contrast to the century-long standardization of the dustbin, wheelie bins have taken only a decade to replace dustbins and plastic sacks in approximately 40% of UK houses (Didsbury, 1995). The privatization of waste services and growing pressure on waste collection companies to improve efficiency parallels the wheelie revolution. From the utility viewpoint, the use of the wheelie bin and the associated delegation of responsibility to the household, means "no carrying with a spin-off financial saving" (Warne, 1995, p. 28). From a household perspective, the wheelie bin provides more space to contain ever-increasing volumes of paper and packaging, and a legitimate place for awkward garden wastes. During the 1990s the capacity of the wheelie bin to 'guzzle' waste, and its subsequent association with uncontrolled mass consumption practices, have led to calls for its replacement. An overflowing wheelie at the centre of a recent Tate Gallery display was, for instance, seen to represent:

A moral about the conspicuous consumption, the waste, the environmental degradation that takes place at Xmas ... Rubbish as a metaphor for market driven society. (Glaister, 1997, p. 26)

At the same time, the wheelie has generated new waste 'problems' for disposal authorities. By diverting some wastes to landfill and encouraging more household deposition, the wheelie bin compounded the problem of rapidly approaching site saturation in many areas. In this way the introduction of the wheelie bin highlights the difficulties of a waste industry with historically separated responsibilities for collection and disposal. In the case of the wheelie bin, collection authorities created space for more household rubbish, leaving their disposal counterparts struggling to preserve landfill capacities from the ever-increasing deluge of rubbish.

Recycling Bins

When you hear the word 'recycling', what springs to mind? Those bins probably that have sprouted the length and breadth of Britain into which you hurl with a satisfying sound of breaking glass green, brown and white bottles. (Withers, 1996, p. 4)

In the UK, recycling bins accompanied the introduction of wheelie bins from the late 1980s onwards. New designs and the remoulding of existing bins have since created a multitude of bin forms, of varying shape, size and function. These range from the wheelie bin whose internal space has been split into dual compartments for recyclable waste and other rubbish, to small lidded boxes specifically for newspapers to the large communal banks of recycling centres. This fragmentation of bin functions links to the increasing differentiation of contemporary rubbish constituents which include putrescibles, glass, ash, green waste, textiles, plastics, paper, chemicals and medicines. Related to the increasing differentiation of bin contents is a new language of colour coding: green, white, brown, yellow or blue marking out the special functions of designated wheelies, coloured boxes, communal banks or specially designed plastic sacks. These new bins mark a radical change in rubbish responsibilities, with multiple options emerging for the separation, classification and collection of waste. The

kitchen itself might now contain a compost bag, one for tins, one for bottles, and one for paper, all requiring in-house differentiation by the household. The kerbside has also changed, with special sorts of rubbish now collected on special days, creating the need for new handling and segmentation regimes. More distant sites, like the communal recycling centre or bottle banks, in turn supplement or shift kitchen and kerbside activity to new locations. This diversification of responsibilities and locations is matched by an increasing range of waste collection companies, including private and public companies, charities, environmental organizations and community groups. Each of these has its own criteria for assessing suitable bin designs and collection regimes, reflecting their own economic, social and environmental objectives, and the physical and administrative structures of waste networks in particular villages, estates, towns, cities or regions.

Recent recycling trends reflect the changing character and intensity of the 1990s waste 'problem', the roots of which lie in the sheer variety and amount of waste elements entering bins in the 1970s and 1980s. Diversifying and expanding consumption practices, supermarkets' packaging policies and the capacity of the wheelie bin to assimilate more waste, have all influenced household practices. New environmental 'problems' have emerged as household rubbish increases pressure on landfill site capacities, and potentially hazardous mixtures of waste elements decompose to create cocktails of landfill gases and leachates, with unknown local and global risks. Waste managers have become concerned about disappearing and contaminated landfill space and the escalating social, economic and environmental costs of dealing with rubbish, leading to calls for more integrated waste management. Such strategies require the linking of consumption, collection and disposal activities across a new hierarchy of management options, and mark a shift from approaches which focus on final disposal to those which emphasize a 'minimize, reuse and recycle' waste ethic. Contemporary challenges to the 'expectation' of public or civic responsibility for waste since privatization of waste services in the late 1980s, change the picture further. New actors are entering the field and the consequent splintering of responsibility has generated many new service options and choices. In tandem, household responsibilities have become blurred, reflecting a new environmental consciousness of what can be wasted, complicated by unequal access to recycling options, which are largely dictated by the changing objectives of diverse waste managers.

Changing Bins and Waste Relationships

As a way of capturing some of the trends illustrated in these bin stories, Figure 2 shows some selected indicators of change in UK waste sectors across the last two centuries.

We have seen how the contents of bins have changed dramatically with the demise of dust and ash and parallel increases in paper and later plastic components, with the total volume of wastes produced almost doubling over this period. Whilst such trends have had a marked impact on bin designs and waste services, we should remember that this is not a one-way story. We need also to acknowledge the reverse possibility: that bins and their associated systems of waste management in a sense create the kinds of waste they require. The changing designs of bin technologies, reflected most distinctly in their changing size, also shape the social organization of production, collection and

Selected Indicators	Modes of Containment/ Representative Timescales			
	Ashpit Early 1900s	Dustbin 1960s	+ Wheelie 1980s	+ Recycling 1990s
Changing Contents ¹ Dust/Ash (D/A): Paper/Plastic (P/P) ratios as % weight of total household waste	80 D/A: 5 P/P	20 D/A: 5 P/P	10 D/A: 5 P/P	2 D/A: 10 P/P
Total Wastes ² Million tonnes of household waste arising	14 m/tonnes		23 m/tonnes	
Changing Designs ³ Size of bin	60-90 litres approx		240 litres	OR 50-litre bins etc.

Figure 2. Changing contents, volumes and designs. Sources: Williams (1998)¹; Waite (1995)²; Warne (1995)³.

disposal. The sheer number of new organizations now involved in waste management will also significantly influence changing bins and associated practices. As yet it is unclear exactly how many new organizations have entered the field, what their specific intentions are or what their influence will be, but the provision of many more bins by these groups implies many more spaces to discard many more things.

Shifting Responsibilities and the Future of the Bin

In placing the bin centrally in a network of social and technical relations, we have revealed and recontextualized relationships in the often murky world of waste. These everyday objects have for almost two centuries been constructed as handling and mediating technologies for civic society. As we have seen, they also contain and create waste ‘problems’, the definition and management of which has constantly reframed household and utility responsibilities in relation to each other. More than just somewhere to dispose of unwanted objects, the bin is a container of cultural, social and technical significance, also anchoring households to the civic society. In this final section we reflect on the shifting boundaries of waste management responsibilities between households and utilities and consider their implications for contemporary and future bin infrastructures. We return finally to the question of whether contemporary bin technologies are constituting the sorts of utility-household relationships which waste researchers and planners want to see.

Shifting Responsibilities

In discussing the bins of the 1990s we have suggested that households and waste service providers confront more ‘choices’ about binning practices and services. Momentarily leaving aside the service networks and utilities which frame such choices, *households* have the ability to make many more judgements than ever before. Should they take their bottles back to the shop for reuse, or turn their organic wastes into compost for their gardens? Should they transport their old

clothes to textile bins at the supermarket, or participate in the local newspaper collection service? The provision of new rubbish bins is arguably compelling people to identify with their wastes, to recognize their different constitutions, and to value some more than others. With this in mind, diverse and conflicting images of household waste management 1990s style are emerging. For example, committed recyclers are to be found washing and segregating every item of the waste stream before careful disposal in a range of coloured bins (Hill, 1996). Less fastidious households may segregate recyclables but take less care over their 'purity', so requiring further 'decontamination' by utilities. Meanwhile, others continue to simply put all their rubbish in one mixed bin, leaving responsibility for segregation to the waste service provider. Clear-cut boundaries of household responsibility are no longer to be found, a situation in sharp contrast to the time when standard dustbins and civic responsibility dictated the rules of domestic waste management. Nowadays, there are multiple 'rules' of wasting reflecting a diversity of quite localized regimes of waste management. Our bin stories also show how patterns of household responsibility are shaped by the specific objectives of *waste utilities* seeking to reinforce particular service networks. As we have seen, the co-existence of multiple waste management strategies is creating new tensions between proponents of 'bottom-up' approaches which place environmental responsibility on the household, and those which centralize and mechanize operations, thus maintaining civic or at least collective responsibility.

Bins of the Future

the dustbin will be with us for very many years ... It behoves to us therefore to be sure that we have the best possible article, and to treat it with the respect which it deserves, for it is just as important in relation to our daily life as any of the utility services providing light, heat and power, or the sewage system which caters for other forms of human wastes. (Stirrup, 1958, p. 13)

Although times and bins have changed, the sentiments of the above statement, given at the 1958 Annual Meeting of the Institute of Public Cleansing, can be re-examined in the present-day context. Bins are important everyday objects and their future development needs careful planning. Bin designers, manufacturers and retailers, for example, are already talking about the *technical* future of the bins in radically new ways. The objectives and influences of these groups on waste networks need to be better understood. One research team is developing an 'intelligent' dustbin, which reads the bar codes on discarded wrappers and transmits such information to compile a shopping list for the supermarket (Arlidge, 1998). Such bins may cut household chores, but may also encourage more consumption. Others are developing underground bin systems with individual swipe cards to identify users who can legitimately deposit waste or to charge customers for the volumes they deposit. The role of such bins in providing an inconspicuous means of accumulating and managing even more rubbish needs to be considered.

The *organizational futures* of households and waste utilities, and the power plays between these groups, also need to be reviewed. Household consumption practices and everyday waste routines look set to play a more significant role in

shaping waste services. Any attempt to predict or define the bins of the future will require consideration of changes to domestic structures and practices. For instance, the emergence of multi-material source separation schemes might stimulate household preferences for larger kitchens with more separated places for storage. At the same time, households may make individual requests for larger or smaller bins to adapt to their specific production patterns. Again, such demands will require flexibility in bin supply. The organizational futures facing waste managers and the extent to which these 'lock' managers and households into particular binning practices also need further investigation. Such networks are at an early stage of development in the UK, and many contracts have yet to be decided. For the time being, bin and servicing options are still relatively open to suggestion. Waste authorities are currently making various claims about the right places for different sorts of bins, in an attempt to consolidate and legitimize their future networks; for example, the claim by some waste managers that kerbside schemes are too expensive and time consuming for high-rise estates, or that households will accept no more than two bins for separation in multi-container schemes. It seems then that we can expect more bins than ever before, in many different places, each representing the attempts of different groups to configure the nature of household collection services in line with their own economic, administrative, environmental and social objectives. A veritable battle of the bins is set to commence, a contest in which waste researchers and planners could usefully engage.

Conclusion

Our dynamic reading of bins incorporates every aspect of waste management, from the backyard or the supermarket trolley, to the landfill site or recycling plant. Many of the social relations which emerge are both neglected and powerful. We need to consider the totality of these waste management systems before deciding if we like what we hear about the *bins of the future*. Paralleling the 'normal' bin for mixed and central collection, we can imagine a range of different coloured bins brightening up our kitchens, gardens, kerbsides and shopping centres. These bins will be tied to centralized or decentralized service decisions made in different areas by diverse organizations, and will strongly influence the boundaries of household or collective responsibility for waste management. Keeping a close eye on these bin developments will reveal much about future waste relationships.

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