

**BURYING THE 'REFUSE REVOLUTION': THE RISE OF CONTROLLED TIPPING IN BRITAIN,
1920-1960**

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Burying the ‘Refuse Revolution’: The Rise of Controlled Tipping in Britain, 1920-1960

Abstract

This article investigates the emergence of ‘controlled tipping’ as the preferred means of municipal waste disposal in Britain between 1920 and 1960. The eventual success of controlled-tipping, despite the availability of alternative disposal technologies, needs to be seen in the context of continually contested understandings of both material and spatial ‘waste’ which determined attitudes and approaches to disposal. After the First World War there was an urgent requirement for cheap means of disposing of increasing amounts of urban municipal waste. The most obvious means of achieving this was by tipping. Tipping had, however, been rejected as insanitary by the emerging waste disposal profession during the period of the ‘Refuse Revolution’ before 1914, and continued to be seen as environmentally damaging. As a consequence, between the wars cleansing experts were in the position of having to recuperate tipping as an environmentally legitimate mode of disposal that was reconcilable with the needs of both sanitary science and landscape preservation. Controlled tipping, with its combined claims to scientific progress and the ability to revalorize municipal refuse, enabled tipping to be reclaimed and reproduced as the dominant mode of municipal refuse disposal in Britain. Controlled tipping, however, faced new challenges after 1945 from changing popular understandings of the value of ‘derelict’ landscapes and the emerging politics of amenity. The ‘Refuse Revolution’ was a work in progress.

Introduction

This article examines the emergence of ‘controlled tipping’ as the dominant municipal waste disposal technology in twentieth-century Britain. Between 1880 and 1914 a radical restructuring of urban refuse collection and disposal took place in Britain (Luckin, 2000; Tanner, 2006); the ‘Refuse Revolution’, as B. Luckin has called this process, was partly a response by municipal government to the environmental shock of nineteenth-century industrial cities, and partly an attempt to establish new forms of biopolitical power over urban subjects, especially the working class (Hamlin, 1998; Otter 2002, 2004). Following the Public Health Act 1875, urban local authorities pursued policies that resulted in the progressive municipalization of responsibility for refuse collection services that had previously been provided by private contractors. In turn, these processes led to the development of a specialist field of knowledge embodied in an emerging cadre of public health professionals (Medical Officers of Health, Sanitary Inspectors and Borough Engineers) who collectively took responsibility for municipal refuse disposal. The increasing

influence of these professionals over rapidly expanding local public cleansing budgets, along with their claim to command specialist expertise in the selection and management of new cleansing technologies, ultimately culminated in the emergence of an entirely new professional identity, the cleansing superintendent.¹ Following established sanitary doctrines, the first generation of professional urban cleansing experts emphasized the dangers present to public health of putrefying organic matter. During the period 1890-1914, they gave considerable support to the introduction of new disposal technologies such as the dust-destroyer, which was seen as providing a purificatory process capable of eliminating dangerous decomposing matter (Melosi, 1988; Clark, 2007).

The emergence of the public cleansing profession contributed to making the efficient removal and disposal of waste one of the primary functions of local government, as well as to the material transformation of the sensory experience of the urban environment. However, the achievements and technological basis of the refuse revolution were unstable, and the aims and parameters of nineteenth-century public health reform were contested (Allen, 2007). The evolution of urban waste disposal systems was driven by a network of political, cultural and economic factors, the constellation of which was subject to challenge and to change. As soon as the environmental transformation of British cities that was desired by Victorian public health dogma had been more or less achieved, it faced in turn a material challenge stemming from its very success: the problem of *waste disposal*. Waste disposal became a contested issue because of a fundamental tension contained within the idea of waste itself. Historians and sociologists have both suggested the bifurcation of the category of waste between the ideas and images of abject (disgusting) matter that legitimate disposal and the modernist impulse to reclaim waste from the condition of abjection (Douglas, 1995; Scanlan, 2005; Wolkowitz, 2007). For cleansing superintendents this tension exhibited itself in uncertainty about whether household refuse should be regarded as useless and dangerous, providing nothing more than an ecology for the generation of disease, or as matter in need of revalorization, the potential of which could be realized by modern disposal technologies. A number of technologies were proposed as solutions to the problem of what to do with house refuse. Before 1914 dust-destruction dominated professional discourses of waste disposal, its popularity a direct consequence of the logic of miasmatic sanitary doctrine (Clark, 2007). Yet, the appeal of incineration proved temporary not because of the survival of competing professional discourses which emphasised the social and economic duty to recuperate waste.

¹ The Association of Cleansing Superintendents, later known as the Institute of Public Cleansing, was created in 1898.

Recycling gained renewed importance in the latter stages of the First World War when ‘salvage’ re-emerged as a serious alternative to incineration, its advocates arguing that burning had proven a scandalous waste of raw materials. In the inter-war period, new municipal recycling technologies (such as salvage, separation, pulverization and composting) received strong and continuous support from many cleansing superintendents (Riley, 2007; Cooper, 2008).

Nonetheless, despite the presence and appeal of alternatives, by the 1960s landfill had definitively emerged as the preferred disposal option. The rest of this article seeks to explain the eventual dominance of controlled tipping in professional discourse as the preferred means of disposal, and to demonstrate the challenges that had to be overcome in order to develop and sustain this position. Firstly, I look at the constraints that were threatening the achievements of the ‘Refuse Revolution’ in the inter-war period, especially the problems associated with waste disposal. Secondly, I investigate the means by which tipping (a widely derided means of disposal before the First World War) was revived and legitimated as an acceptable waste disposal technology between the wars. The professional and technical discourses surrounding the emergence of ‘controlled tipping’ thus constituted a successful attempt to rehabilitate a form of disposal that sanitarians had previously deprecated. Finally, consideration will be given to the limits to this act of recuperation of tipping, and particularly to the changing context of popular ideas of landscape preservation after the Second World War which would play an important role in producing opposition to landfill in the post-war period.

An unfinished revolution

Before turning to the processes by which professional discourses recovered tipping it is important to understand that the ‘Refuse Revolution’ was far more incomplete and patchy than the term may at first suggest, it was, in short, an unfinished revolution. Indeed, the ‘revolution’ is probably better understood as an evolving *process* of change in the means of reproducing hygienic subjects than as a once-for-all transformation of urban governance. By the 1920s the technical and administrative achievements of the ‘Refuse Revolution’ were still largely confined to urban areas; *ad hoc* collection and disposal persisted over large areas of rural Britain, a fact that appeared increasingly incongruous with urban circumstances as well as with notions of good health and landscape preservation. In 1933, E.B. Ashford and H. Baker revealed in a pamphlet published by the Society for Checking the Abuses of Public Advertising (SCAPA) that: ‘In rural districts...the current practice [of refuse disposal] varies enormously, from systematic collection and disposal by the rural district council on practically urban lines, down to a system of “individual disposal”,

if it can be called a system at all...the possible inconveniences and objections of the last practice are obvious' (Ashford & Baker, 1933: 1). Changing patterns of consumption, suburbanization and the role of new technologies in networking the country and city made such idiosyncrasy increasingly anomalous and, to some eyes at least, intolerable: 'When a house or cottage burns coal or wood indoors and has a garden, everything can be got rid of by burning or burying; but with the gradual spread of gas and electricity to country villages burning will become more difficult and many country cottages have no gardens, or too small a garden for burying purposes' (Ashford and Baker, 1933: 1). E. Walshe observed in 1934 that, 'The whole world has changed lately, and country life more radically than town life. Tins, bottles and tough cardboard packages, a daily paper, abound in every cottage, and are difficult to dispose of in the quantities which prevail' (*Manchester Guardian*, 1934). Such conditions could prove an unpleasant surprise to urban visitors; one 'Miss Florence' wrote to *The Times* in 1929 asking:

How are we to expect the general public to respond to the many appeals for the preservation of the countryside by the avoidance of litter when local authorities, who surely should be pioneers on this question, sometimes set so bad an example? I have recently visited the beautiful little village of Findon, Sussex, where I was horrified to find an open refuse dump by the road side on the direct route to the Downs. It appears that this unlovely spot, full of old tins, kettles, paper, and the like, which scatter on to the road and even on to the common opposite, is actually the recognized dumping ground of the village! (*The Times*, 1929a).

Relatively few rural local authorities could afford the investments in infrastructure, labour and organization required to establish a comprehensive municipal cleansing system, and where habitations were geographically dispersed transport costs made waste collection prohibitively expensive. Thus, the spread of the refuse revolution to the country, despite the best efforts of rural campaigners such as the Women's Institute, remained extremely uneven.² Informal village dumps remained the norm in many rural areas regardless of their impact on the landscape.

The refuse problems of city and country were intimately connected. The achievements of urban sanitary reform, combined with continued urban expansion to present particular challenges to rural areas on the periphery of the great metropolises. Suburban populations, especially those

² The *Municipal Journal and Public Works Engineer* praised the efforts of Women's Institutes to promote municipal refuse collection in rural areas: 'when women take the lead in agitating for better cleansing they succeed because their agitation is tireless... I hope that they will continue to agitate until such things as beastly as crude refuse dumps and the absence of collection services are things of the past' (*Municipal Journal*, 1932: 61).

in the South-East of England, generated more both more material waste and larger spaces requiring the services of municipal public cleansing departments (MOH, 1930:2). Much of this refuse ultimately found its way into dumps outside metropolitan administrative boundaries. In 1915, a Local Government Board (LGB) return on urban scavenging found that 48 out of the 96 largest towns and cities in Britain exported waste outside their administrative areas, and that roughly a quarter of *all* urban authorities did likewise. Around the periphery of the London County Council (LCC) area tipping occurred in the counties of Essex, Middlesex, Hertfordshire, Kent, Sussex, Buckinghamshire and Bedfordshire (Dawes, 1929: 4). Although 221 authorities had dust-destructors, 908 were without such systems and in total some 709 towns were still using dumps as a primary means of disposal (*Municipal Journal*, 1915). Despite the municipalizing impulse of the ‘Refuse Revolution’ many dumps were still operated by private contractors or railway companies and subject to inadequate or unclear regulation. The ‘crude tipping’ of waste that was practiced at many of these tips involved little more than dumping a large mound of refuse on some land declared ‘waste’ or ‘derelict’, or the in-filling of an unused gravel pit.

The most notorious of all inter-war dumping grounds was the river-side tip at South Hornchurch. It is worth looking in detail at the discourses surrounding this dump which had an important impact on professional and public opinions of crude tipping. The two tips at Hornchurch, both of which took waste from the City of London Corporation, were run by two different firms of contractors. Their scale was gargantuan considering their condition. Together the two tips constituted a single dumping ground two thirds of a mile long and a third of a mile wide. The Ministry of Health’s Inspector of Public Cleansing, J.C. Dawes, described the tip’s history thus:

From information obtained locally it appears to have taken about 35 years for these dumps to grow to their present immense proportions; they are now extending rapidly in the direction of the Tilbury Road and the Becontree Housing Estate and at one point, where the dump is already 90 feet high, another layer of refuse is being added. About 350,000 tons of London house and trade refuse, street debris, river dredgings, soil, etc., are being dumped annually on these two dumps and the small one adjoining...The amount of house refuse so deposited is probably in excess of that collected annually at Manchester (Dawes, 1929:30).

Dawes constructed an apocalyptic visuality for the dump, describing the ‘scarred and fissured surface...extending inwards for a considerable depth from the tipping face, evidence of extensive and deep-seated fire which frequently – one might almost say regularly – reaches up to the

surface and envelops the great malodorous mass in a characteristically evil smelling cloud of smoke' (Dawes, 1930: 30). The water flowing through channels in the marshes on which the dump was situated 'had the appearance of being heavily polluted'. Five years after Dawes's report A.G. Linney described the Hornchurch dump as a place on 'the fringes of desolation' with a distinctive topography of abjection, including a:

[C]urving coastline of, as it were, cliffs stretching along eastward, coming down to the marsh flats, as to a coast and sea level. This cliffed "coastline" has "bays" and "headlands". In places it is no more than 20 feet above "sea level" and at the east end it rises to a height of 70 or 80 feet...Coarse vegetation covers much of the dump plateaux, and there are plenty of bushes and stunted trees. Occasionally comes to flower a lovely exotic plant of which some chance seed arrived to give beauty among foulness. (Linney, 1934)

For Linney and Dawes, Hornchurch presented a sublime landscape of horror, an abject, corrupt wasteland. These horrific visualizations of the dump were further compounded by the Hornchurch's social geography, and especially its unfortunate proximity to the LCC's showpiece housing estate at Becontree. As Dawes observed, the suburban growth of London had 'brought new housing estates into unwelcome nearness of the dumps' (Dawes, 1929:30). The unfortunate contiguity of the LCC's most ambitious municipal social housing project arising alongside the mountainous waste of the Corporation of London was compounded by the history of tensions between a conservative City Corporation and reforming County Council. Dawes argued that the Corporation did not have the right to damage the surrounding environment with impunity, the quality of which, after all, was supposed to provide the *raison d'être* for the new estate.

Only comparative isolation from built-up areas can be urged in justification for [the dumps] existence to date, and this claim cannot be made any longer. Once detached and separated from a populated area, they now constitute a disfiguring and damaging environment to a rapidly-developing district, and the case against continuance on the present lines appears to me to be overwhelming when viewed from the standpoint of public health (Dawes, 1929:30).

Hornchurch was, of course, only an extreme example of a more general phenomenon.³ As cities and their suburbs became cleaner the perceived threat waste presented to public health and

³ In Romford in 1929 a special sub-committee of the Urban District Council (UDC) found that the district tip, situated at an old brickfield on the Hainault Road, was 'strewn with vegetable and other refuse, and no apparent effort had been made to cover the same, but merely trodden or pressed down'. Since the land

amenity shifted from the urban streets to suburban dumping grounds. Public cleansing was subject to greatly increased surveillance by central government. With the creation of the Ministry of Health in 1919 public cleansing activities attained greater administrative and political priority within central government (Wilding, 1967; Honigsbaum, 1970). Public concern over the positioning dumps encouraged the intervention of central government in a problem that had previously a purely local matter. Particular attention was paid to waste disposal and controlling the costs of disposal (MH, 1930:1). In June 1922, the Ministry of Health (MH) held the first multi-authority conference on refuse disposal. The meeting was attended by representatives of each of London's metropolitan boroughs as well as those of a number of suburban and rural districts. The meeting followed the initiative of Crayford Urban District Council in circulating a letter to those sanitary authorities bordering London asking for support in drafting legislation that would enable local authorities to veto the dumping of other authorities' municipal refuse in their districts (*Municipal Journal*, 1922: 337). The meeting demonstrated the existence of widespread suburban resentment at metropolitan boroughs' waste exports (NA, 1922a).⁴ Tottenham's Medical Officer of Health summarized his frustrations thus: 'it seems extraordinary that that no statute exists to prevent private ground being made use of for the deposit of refuse to the serious detraction of the amenity that occupiers of neighboring premises are subjected to and the deterioration in value that owners have to tolerate' (NA, 1922b). The meeting revealed tensions over the distribution of waste disposal sites even within the metropolis itself. Hackney's representative complained that his borough took the refuse of others 'when we ourselves burn every ounce of our refuse. Therefore we feel rather acutely that tips are a nuisance' (NA, 1922c). The result of the conference was the drafting of a Ministry of Health circular to all local authorities that contained a range of minimal requirements for dumping waste. These included the shallow layering of waste, covering with earth and ashes, and the prohibition of tipping in wet pits. Local authorities were encouraged to ensure that disposal contracts stipulated carefully these conditions and that they conduct regular inspections of contract dumping sites (*Municipal Journal*, 1922: 546). Despite, these suggestions, when a similar deputation of Essex 'riverside' authorities met at the Ministry of Health in July 1930, conditions in many areas had changed little and suburban authorities were still demanding powers of veto (*Municipal Review*, 1930: 307).

surrounding the dump was being built over, a growing number of complaints were being received by the UDC (*Romford Times* 1929a:1: 1929b:1).

⁴ In 1931 George Bernard Shaw wrote to *The Times* complaining of a dump run by Islington borough council in the vicinity of his home at Wheathampstead, Herts (*The Times*, 1931).

Acceptance of a local veto power would have created a crisis of disposal for metropolitan boroughs and neither the Ministry of Health nor the subsequent *Report* of the Departmental Committee on London Cleansing, supported the idea (MH, 1930). Yet, the legitimacy of suburban complaints against crude tipping was widely accepted. Dawes observed that: ‘It will probably be generally agreed that, difficult as may be the finding of a good and economical alternative, there should be no avoidable delay in stopping the indiscriminate tipping of refuse in huge dumps in any locality where it may injure local amenities’ (Dawes, 1929: iii). A. L. Thompson noted the infringement of both sanitary principle and landscape preservation which crude dumping represented:

Public opinion in Great Britain is in vigorous revolt against such a crude and irresponsible method of disposal. And rightly so too! The practice is indefensible. To establish by public act extensive fly hatcheries, rat breeding grounds, and weed nurseries; to daily distribute filth coated papers over the countryside; to mar fair rural scenes by unsightly mounds, and to pollute the atmosphere of an extensive neighbourhood by the odours of putrefying rubbish or of organic matter under slow combustion is wholly inexcusable. More, it is nothing short of organized vandalism and insanitation – strange and inconsistent acts to do in the name of cleansing. Heartily, therefore, we can join with those who demand the outlawry of mass dumping (Thompson, 1933, p. 8.).

But there were few alternatives. There were limits to what cleansing superintendents could achieve in terms of disposal, perhaps the most important of which was financial. The relatively generous Local Government Board loans regime that had existed prior to 1900 ended with the First World War. Local government was compelled to pay greater attention to controlling the costs of public cleansing (*Municipal Journal*, 1928; 1933). The 1920s and 1930s saw increased attention given by cleansing officers to new cost-saving management techniques, transport technologies, and efforts to reduce the labour requirements of cleansing services. Whereas pre-war cleansing professionals had to a degree been able to on the problem of sanitation regardless of cost, men like J.C. Dawes increasingly built their professional reputations by controlling the costs of disposal. The pressure to retrench disposal costs was further increased by central government surveillance. In 1926 the Ministry of Health first began collecting annual statistical series on the comparative cost of public cleansing services across the country, making cost comparisons between local authorities possible for the first time.⁵ That these efforts partly paid-

⁵ Between 1926 and 1939 the Ministry of Health published these returns separately as *Public Cleansing. Extracts from the Annual Report of the Ministry of Health with Summaries of Returns from Local Authorities*.

off is suggested by fact that the cost of disposal was, in relative terms, falling by the middle of the 1930s (*Municipal Journal*, 1934), but cost control placed limits on which technologies could be adopted, especially for smaller towns and rural authorities. Incineration was increasingly eschewed as too expensive by many local authorities (*Municipal Journal*, 1925).

Another limitation was a function of the materiality of new disposal methods. Most ‘disposal’ technologies, such as sorting, pulverization and even incineration, are, in reality, waste *treatment* techniques; they still create a residuum requiring disposal. A few cleansing officers did admit to the endurance of ‘waste’ through these processes, on the entropic grounds that matter could not finally be destroyed, but the implication of this was that everything, if not reused, ultimately had eventually to be dumped somewhere. The alternative to dumping on land or at sea (i.e. dumping into the air by means of incineration) was increasingly problematic due to mounting post-war concern with the smoke and dust pollution (Thorsheim, 2006; *Municipal Journal*, 1934: 1175). Recycling, on the other hand, was only viable if there was a functioning market for waste products, and this varied widely according to geographic and economic variables. Hence, the material resistances of waste often determined that tipping was the only viable mode of disposal. But the reputation of tipping in public and professional quarters lay in tatters. Bad sanitary practice, along with the arguments of earlier sanitary reformers had discredited it (Gandy, 1993: 71; Clark, 2007; Goodrich, 1903: 21). In 1921, Gloucester’s City Surveyor, E.W.A. Carter, recorded the condemnation which tipping had till then received from the ‘whole Medical Profession’ which, he somewhat tendentiously argued, thought incineration to be ‘the best of all methods’ (Carter, 1921). A. L. Thompson admitted that there was a tendency toward ‘wholesale condemnation of tipping, without any examination of the possibility of continuing the system’ (Thompson, 1933: 13). E. McLaughlan decried the ‘unfortunate circumstance’ that ‘the very mention of the word “tipping” is invariably the signal for a public outcry’ (McLaughlan, 1936: 1). Advocates of tipping were constrained to find ways of redefining it as neither insanitary nor necessarily wasteful. In the process a number of cleansing superintendents reacted against the established principles of medical knowledge, and began reject the logic of those disposal regimes which their predecessors had put in place.

Legitimizing tipping

Controlled tipping came into being around 1915. It was developed by the Bradford Corporation, and the method was subsequently often referred to as the ‘Bradford System’. The process involved the sequential layering and compression of refuse into either existing or prepared

depressions in the ground. These were lined by compressed earth, clay or subsoil, which was supposed to prevent contamination groundwater. The refuse was tipped in stages horizontally across the face of the tip so that it formed a series of ‘cells’ whose compact size was supposed to make possible a nightly covering with earth or ashes six to nine inches deep. This system of disposal was developed in a very particular political and economic context. The war had brought a halt to the generous loans system which had underpinned the growth in public works expenditure down to 1914. In 1915, the Bradford Corporation’s application for a public loan for new incinerator plant was rejected by the Local Government Board, and there was a clear need for a new, cheaper, system of disposal. The Corporation’s Cleansing Officer, Ernest Call, decided to substitute the existing system of incineration with tipping. He also wished to demonstrate that, this previously castigated system remained capable of contributing to projects of social reform in the city. Call therefore focused on the capacity of refuse tipping to reclaim land for public parks, gardens and other open spaces. Although Call’s sanitary precautions may have been basic, involving little more than an adaptation of existing tipping methods, it was the way in which these were articulated that suggested the potency of ‘controlled tipping’ as a means of legitimizing tipping.

Call’s articulation of the Bradford System of controlled tipping exercised a number of discursive advantages over incineration or crude tipping. As suggested above, the first of these advantages was its use in land reclamation. Controlled tipping was represented as a means of simultaneously combining two things, troublesome matter and derelict space, in the process transmuting them into something of utility: land. As the idea of controlled tipping grew in professional esteem, Call was compared by fellow cleansing superintendents to a magician who:

[W]aves his hand over a disreputable waste [land] where rubbish has been thrown promiscuously for years, over uncultivated soil surrounded by hideous hoardings broken and battered, and forthwith his scientific tipping arrangements come into operation. The land is built up with a precision we ordinarily devote to the structure of buildings. Presently the holes and pockets are “ironed out,” and ... a wide area of level land emerges covered with grass and graceful with flowering shrubs’ (*Municipal Journal*, 1931: 1144).

The claim that controlled tipping could restore derelict land was critical to restoring the inter-war reputation of tipping as a waste disposal practice. Throughout the nineteenth and twentieth-centuries waste disposal technologies were represented in a variety of ways as not just means of disposing of waste but also as ways of reclaiming its hidden value. The recurring trope of the

‘magical’ revalorization of waste was therefore vital to establishing the progressive status of any particular disposal technology. ‘Dust-destruction’, for example, had long been argued by its many pre-war advocates to be far more than the healthiest means of destroying refuse; it was also presented as a system of energy and resource recovery. Before 1914, incinerators were the primary sources of energy for electricity generation in a number of towns, and cleansing professionals represented crude tipping as a wasteful neglect of raw materials. The capacity to associated controlled tipping with the recovery of waste and the improvement of ‘wasteland’, reasserted the productive potential of tipping and thereby its modernity.

Professional advocates of controlled tipping had, however, to do a considerable amount of work to make controlled tipping legitimate. They had, for example, to respond to the reputation of dumps as eyesores. The capacity of controlled tipping to reconstitute derelict landscapes was crucial in this context. In place of the apocalyptic vision of a ‘disreputable wasteland’ associated with dumps like that at Hornchurch, controlled tipping was claimed to offer a means of recuperating waste landscapes. A.L. Thompson argued, for example, that controlled tipping could actually restore lost landscape amenity.

The aesthetic side of depositing refuse on land must not be overlooked. In the past it has been callously disregarded, hence the vigorous opposition often encountered when one local authority invades the territory of another and hence the clamor for complete protection against such a practice. The movement for the preservation of rural beauties deserves every support and encouragement. But from what I have already said, instead of defacing the countryside in any way, refuse can be utilized to improve it (Thompson, 1933: 17).

Controlled tipping promised not just to dispose of municipal refuse, but also to utilize it in the remaking of disordered landscapes (*The Times*, 1929:16; *Municipal Review*, 1934: 387). Its advocates drew upon the imagery of ‘wasteland’ as useless or derelict space possessing a threatening ecology and neglected productivity and promised to recycle it into a rational, productive landscape (Scanlan, 2005; Oelschlager, 1993; Coulton, 1994). By recovering disorderly ‘waste’ spaces controlled tipping promoted ‘rational’ behaviour by those who used them. The *Municipal Journal* proclaimed triumphantly that, under Call’s surveillance, ‘in the course of two or three years, disused quarries, unsightly and ragged hillsides, sluggish ponds, undrained valleys and pits with danger as their attribute, are changed to places where young people find rational recreation after the day’s work is done, or into gardens where old English border flowers are grown to decorate the homestead or as gifts to local hospitals’ (*Municipal*

Journal, 1931). In this consummation of human productive effort, spaces of untamed, post-industrial nature could be restored to the garden of England by returning the refuse of modern society to its origins. This demonstrated that tipping was: ‘not simply a cheap disposal method, it is a means of utilizing the material to create a valuable end product in the form of arable land or ground for public parks or recreation fields... It is one way in which Nature can be put together again and won to yield her increases in crops or pleasure’ (Thompson, 1933: 17). From this perspective controlled tipping could be seen as a ‘geological’ process ‘in so far as portions of the earth’s surface are altered in their local characteristics by the restoration of the refuse in orderly or disorderly fashion, to its primal source, the land – earth to earth, ashes to ashes’ (Thompson, 1933: 7). Controlled tipping was not to be viewed as a waste of resources. Rather it was presented as a rational restoration of the natural order.

The rhetoric of utilization and restoration was, however, only one of two main strategies employed to recuperate tipping. The second was the rhetoric of scientific discovery and progress associated with the employment of bacteriology in defences of controlled tipping. Bacteriology, which enjoyed increasing status and influence in the early twentieth century, was presented by the proponents of controlled tipping as new scientific knowledge that rendered previous epidemiological understandings of the health risks associated with tipping obsolete. This made it possible to overcome the traditional objections to tipping on the basis of the risks it posed to public health. The epidemiological categories of putrefaction and disease had previously been employed by nineteenth and early twentieth century sanitary practitioners to urge the rapid removal decaying matter from the human environment. The ultimate end of sanitary practice was to render this putrefying refuse matter ‘inert’. The attraction of incineration before 1914 was due in part to its ability to achieve the rapid ‘purification’ of putrefactive matter by fire. These dominant understandings of the public health risks of tipping were rejected in the inter-war years by a few like A.L. Thompson, who attacked such ‘obsolete etiology’ and believed that bacteriology had exploded ‘the Hippocratic notion that epidemic disease arises from miasmatic conditions’ (Thompson, 1933: 9).⁶ Overall, however, concern with the escape of smells from tipping sites and miasmatic fears remained remarkably resilient. In an assessment of controlled tipping made in 1936 by the borough engineer of Ipswich, E. McLaughlan, it was stated that the aim of the cleansing official remained the reduction of household refuse ‘to an inert mass, entirely inorganic in character, at the earliest possible moment’ (McLaughlan, 1936: 1).

⁶ In 1922 a report on tipping around Manchester warned that ‘the dissemination through the air of particles of septic matter may account for the excessive incidence of septic disease’, (Municipal Journal, 1922b).

The influence of bacteriology did not, therefore, render traditional public health concerns over tipping irrelevant, and the aim of rendering refuse 'inert' remained an important priority. However, the discoveries of bacterial science could be applied to suggest the availability of new means of achieving the same ends. The discovery of enzymes in particular provided a basis for arguing that the controlled tip could out-perform the dust-destroyer as an instrument of sanitary disposal. Enzymes, or 'colloidal solutions', simply replaced the chemical combustion of the incinerator with the bacterial 'decomposition' of the tip, and simultaneously provided the object of professional control which legitimated the status of the professional cleansing officer. As McLaughlan argued 'very small amounts of these solutions suffice to split up relatively large amounts of substances of compounds which, of themselves, are of highly stable or fixed nature' (*Municipal Journal*, 1934). In this bacteriological context, the 'waste cells' of the controlled tip acquired another beyond making the tipping process manageable. Increasingly it was claimed that the sealed cells of the controlled tip promoted the 'natural' process of decomposition by raising temperatures within the refuse to the point at which thermophilic bacteria could thrive. 'Decomposition' then reduced waste to an 'inert mass' without either direct human contact or the need for expensive, polluting incinerator plant. As I.G. Gibbon welcomed controlled tipping as indicative of 'how Nature with a little wise assistance will produce for us results which many too readily assume can be effected only by costly plant' (*Municipal Journal*, 1934a: 1133). Bacteriology enabled the claim that science had uncovered a new means of refuse disposal that worked in concert with nature rather than against it (Hamlin, 1988). The controlled tip turned putrefaction from a natural hazard into a natural ally in the work of waste disposal. As the *Municipal Journal and Public Works Engineer* noted: 'With greater knowledge of the biological action of the soil on all forms of mineral and organic waste, Nature is seen to have placed in our hands, at trifling cost, the most efficacious method of dealing with the refuse of great populations' (*Municipal Journal*, 1931: 1147).

As suggested above, the emergence of bacteriology did not straightforwardly unpick the sanitary knowledge and associated technologies that had sustained the refuse revolution. The idea that putrefying waste was a serious risk to the public health was not displaced by a 'bacteriological revolution' (*Municipal Journal*, 1932). Rather, bacteriological explanations of putrefaction were tacked onto existing epidemiological knowledge. Consequently, tipping became subject to an increasingly complex 'economy of risk', which included as causes of potential disease and environmental harm factors such as smell, putrefaction, pathogenic action,

fly and rat infestation, fire, the release of poisonous gases, and ground-water pollution.

McLauchlan admitted that controlled tipping promised much:

‘[B]ut it is to be realized that there are still many who object to this method; their hesitation to accept assurances that everything is quite safe cannot be regarded as foolish. Their case is usually: “We dislike the idea of tipping; do you realize the danger and objectionable character of putrefying organic matter? There is also the danger of pathogenic bacteria being present. Are you not providing an ideal breeding ground for vermin? And so on, which is all very understandable, but not quite so real as critics would have one believe’ (McLauchlan, 1936: 2).

In 1936, in response to these kinds of concerns, B.B. Jones and F. Owen (Director of Public Cleansing and Chief Chemist of the Manchester Corporation respectively) jointly published a book entitled *Some Notes on the Scientific Aspects of Controlled Tipping* (Jones and Owen, 1936). This report of experiments conducted on a ‘controlled tip’ at Wythenshawe between 1932 and 1933 purported to be an objective assessment of the risks associated with the new method of disposal. Its publication was viewed as necessary because, although controlled tipping was becoming increasingly acceptable:

There may still be a few recalcitrants, however, and their distrusts and hesitations cannot be dismissed as merely foolish. Epitomised, their case is this: We dislike the idea of tipping refuse at all in any form, controlled or otherwise. There can be all kinds of unpleasant things in household refuse – decaying food scraps, fish and meat gone bad and already in an active state of putrescence before it gets to the tipping ground; materials which may have been in contact with infectious disease; anything. We know that after this stuff is tipped you seal it, top and sides, every few feet to an ordered plan. We agree that it all looks very tidy and neat and that no apparent harm has come as yet. But are you sure it is safe and sound; at first and for always? Tell us what happens to all that organic matter that lies beneath the sealing surface; those micro-organisms breeding in the tip. We want to know (Jones and Owen, 1936: 3).

The report was aimed at ‘Medical Officers and others, who are concerned more primarily with the hygienic side of local government administration than the strictly economic’, a pointed jibe at the imputed influence of older sanitary ideas among MOHs, but also a recognition of the political priority of controlling the cost of public cleansing (Jones and Owen, 1936: 1). The authors offered a positive answer to the question ‘Is controlled tipping safe?’ a result which they emphasized was ‘simply the result of the inquiry and not the object’ (Jones and Owen, 1936: 4).

One of the notable features of *Some Notes* is the significance given to the ‘seal’ of earth that enclosed the waste contained within. The ‘seal’ was the main source of technological control from which ‘controlled tipping’ received its name. The ‘seal’ played various roles in the legitimization of controlled tipping. First, it regulated the sensory impact of the tip by isolating and hiding the refuse from the outside world, and constraining its gases. It provided a visual and olfactory barrier that invalidated fears of putrefactive smells escaping from the tip. Second, the seal was claimed to control the surface ecology and aesthetics of the tip by preventing the breeding of fly larvae and rats, and ensuring ‘a neat and tidy appearance in the tip as a whole’ (Jones and Owen, 1936: 4). It therefore negated any effort to present controlled tipping as destructive of the landscape. Finally, the seal ensured the operation of the biological aspects of controlled tipping by maintaining the temperatures needed for decomposition and the destruction of harmful pathogens. The ‘seal’ thus became the ultimate source of legitimacy for the controlled tip. It represented a multi-faceted boundary between a ‘safe’ outside world, and the ultimately mastered, biological risks and sensory horror of the bacterial processes contained within. The claim that controlled tipping was safe ultimately rested on the ability of the seal to establish and maintain a boundary between the waste and disorder inside the tip, and an orderly, hygienic outside.

Controlled tipping and the politics of amenity

The success of the various discursive strategies employed to legitimate tipping is suggested by the dominant position that controlled tipping established between 1920 and 1970. B. Luckin has suggested that controlled tipping accounted for about 90 percent of refuse disposal by the 1960s (Luckin, 2000). By 1968, 834 out of 1,226 local authorities in England and Wales disposed of their domestic waste primarily through ‘controlled tipping’ (Flintoff, 1968: 756). It would be mistaken, however, to view the rise of controlled tipping as a final triumph for the ‘Refuse Revolution’, which continued to be contested. In the period following 1945 these challenges appear to have originated increasingly from a widening and evolving popular concern with the politics of amenity. However, this politics of amenity was distinctive from the preservationism that had originated in the late-Victorian. It was partly exhibited in an evolving political concern with issues of countryside access and leisure, but it had more earth, grassroots origins. Indeed, in many respects the post-war understanding of amenity was increasingly contested, as the environmental conditions of communities increasingly became the objects of popular political concern. The popular (as opposed to official/elite) politics of amenity often challenged official versions of rationalized, planned landscapes of the kind that had partly underpinned the

legitimacy of controlled tipping as a means of reclaiming derelict spaces. Rather, amenity politics in their popular form contained hopes for the preservation of ‘natural’ or ‘wild’ spaces as these were defined and understood by local communities. In this changing cultural context controlled tips were attacked for their detrimental effects on access to ‘natural’ (as opposed to derelict) spaces. The ‘waste’ land which controlled tipping originally sought to reclaim, underwent a significant reevaluation after the Second World War by local populations that increasingly viewed such areas as important communal ‘amenities’. What public health officials had constructed as one of the advantages of controlled tipping, its utility in land reclamation, was subsequently transformed into a threat to environmental amenity.

In pursuing this line of argument, it is important to reconsider our understanding of amenity politics. Although national preservationist organizations such as the National Trust or CPRE certainly contributed significantly to the emergence of amenity politics, they were generally committed to protection of environmental aesthetics rather than to more communal views of environmental utility. This can be seen particularly in the position of such organizations on rural tipping. The complaint of the Sheffield and Peak District branch of the CPRE perhaps typifies the perspective of official preservationism with its emphasis on the *placing* of dumps: ‘The present practice of refuse tipping in the rural districts of Derbyshire is causing wide concern. There are instances of district tips which have been placed in areas of considerable natural beauty which are much frequented by the public’ (NA, 1947). Concerns with the preservation of rural beauty did not imply a wholesale rejection of controlled tipping by amenity organizations, which might well have uses in reclaiming the English landscape. The ideal dumping site remained ‘derelict’ land, although the Manchester branch of the CPRE was concerned that this was often too far from rural communities to be affordable, ‘And so some small but, it may be charming and innocent hollow is smothered’ (*Manchester Guardian*, 1953). At the level of the individual place the evaluation of what did and did not constitute ‘derelict’ or ‘waste’ land was rather more problematic, as the Sheffield branch of the CPRE recognized when it observed that ‘What may appear to be suitably secluded waste land may well turn out to be a most cherished dale head delighting thousands of visitors’ (NA, 1947). However, most post-war opposition to controlled tipping actually came from outside official preservationist circles. There was a growing series of local disputes over the siting of controlled tips on ‘waste’ land which local communities actually considered of distinct use. The communities often articulated their opposition in terms of local evaluations of place and nature in contrast to the rationalizing and restorative mindscape of either official

preservationism or local authorities. Contested understandings of place came to bedevil attempts to create controlled tips and became a source of a genuine grass-roots environmental politics.

The post-war years saw a growing number of increasingly well organized complaints against proposed controlled tipping sites across Britain. In 1949 a plan by Esher Urban District Council to 'reclaim' Ditton Common by means of controlled tipping was opposed in *The Times* as an attempt to create 'another green pancake on the fringe of London' (*The Times*, 1949). At stake was 'a piece of land in its natural state where gorse and brambles flourish and wild flowers grow in profusion on the grassy slopes...the home of many aquatic plants that naturalists delight to find so near London' (*The Times*, 1949). The idea that controlled tipping produced unnatural landscapes was an important and apparently novel challenge to the ideas of land reclamation which dominated the professional rationale for controlled tipping. In 1954 a site for controlled tipping, proposed to be placed at Didsbury by the Manchester Corporation, was attacked by the East Didsbury Owner Occupiers' Association. One member, Dr R.L. Holt, argued that 'if this proposal were adopted one of the few remaining amenities of South Manchester enjoyed by the whole city would have been ruined for at least a very considerable time' (*Manchester Guardian*, 1954a). At a public enquiry the residents opposed what they called 'the needless spoliation of a place of natural, rural beauty, unique in Manchester' (*Manchester Guardian*, 1954b). The Corporation's case (that controlled tipping presented the cheapest means of disposing of the 200,000 tons of refuse produced by the city annually and that the tip would eventually be reclaimed as playing fields and allotments) was met with disdain by residents. One of them rejected the new 'amenity' site as providing no more than 'a dull expanse of weeds' (*Manchester Guardian*, 1954b). Although the Ministry of Housing approved the Corporation's plans, residents no doubt took grim satisfaction from floods of 1956, which vindicated their claim that the dump would narrow the flood plain and increase the risk to local properties from flooding of the Mersey (*Manchester Guardian*, 1956). In 1954, Holyhead Urban District Council lost an appeal to the Ministry of Housing and Local Government against Anglesey County Council's refusal to allow a controlled tip at Penrhos Beach. Holyhead presented the proposed tip as a means of recovering 'derelict' land for agricultural use, but Anglesey County Council's Planning Committee had recently 'designated a good part of the Anglesey coastline as land possessing beauty, value and scientific interest' (NA, 1954). A sense of the importance of this area to local residents can be gleaned from the language of a petition signed by three-hundred people from the Penrhos Beach neighbourhood. This stated that the beach was 'a much frequented area and it is the natural

playground for the children of the neighbourhood', along with the fear that the tip would be a 'magnet to the children' (NA, 1954).

It is insufficient to see these forms of opposition as mere NIMBYism. They represented a meaningful contestation of the power to determine the definition, value and final use of particular places. While professional cleansing discourse had established a requirement to view land reclamation as a duty, local communities increasingly saw the same process as the needless destruction of communal open space. Even the in-filling of disused quarries, which was seen by officials as an obviously unobjectionable means of dealing with household waste and derelict industrial spaces, began to spark vigorous opposition, as in the case of proposals by Kent County Council to fill quarry pits at Dartford (*The Times*, 1956). In 1963-4, Bournemouth Borough Council sought permission to tip at a former quarry at Hengistbury Head. As one local opponent of the plans, Lt. Col. A.L. Paris, put it 'doubtless the Council considered that this would do no harm and would be an inexpensive way of dealing with the difficult problem of refuse' (NA, 1963a). Local objections to the scheme revealed considerable opposition to the proposals however based largely on the archaeological and geological interest of the quarry as well as the uses of the area as an open space. The Hengistbury Residents' Association feared 'that the amenities of this local beauty spot, which the association has so much at heart, and which is scheduled as an open space, might be disturbed' (NA, 1963b). The younger generation, it argued, 'rather liked the quarry and what there was in it, as a change from the usual playground made and set aside for them. From this point of view the quarry was certainly an amenity' (NA, 1963b). The residents' desire to preserve the quarry contrasted with the official view that landfill would constitute an act of 'restoration', a position that was actually supported by the local CPRE (NA 1963c). Significantly, the Ministry of Housing inquiry ultimately sided with the residents' objection 'to using a well known beauty spot and bird sanctuary as a refuse deposit' (NA, 1963d).

The emerging politics of amenity suggested that those technologies that controlled tipping had marginalized, incineration and recycling, might still have their uses in defending local amenity. In June 1951, the Buckinghamshire Women's Institute renewed the inter-war demand for urban areas to be made to solve their own waste problems, suggesting to the CPRE that the Ministry of Health ought 'to provide adequate refuse destruction plant in all towns, so that the tipping of refuse in the surrounding districts may be avoided, health may be safeguarded, and beauty preserved' (NA, 1951). The CPRE responded by pointing out that, 'A long time ago the Ministry of Health decided that controlled tipping was far better than getting rid of rubbish by means of

incinerators. Since then the Town Planning Authorities have been refusing to allow incinerators in towns. They mean smoke, smell and turn any neighborhood into a slum'. Nonetheless, a shift in popular attitudes towards controlled tipping was clearly taking place. When controlled tipping was established between the wars as the preferred means of municipal waste disposal there had been few if any voices against it. Official preservationist discourse strengthened the case for controlled tipping. The post-war popular politics of 'amenity', which contested the identification of waste spaces as derelict and therefore suitable for reclamation, posed a new challenge to controlled tipping, one that it would prove increasingly difficult to respond to.

Conclusion

What conclusions should be drawn about the nature of the Refuse Revolution from the history of controlled tipping in this period? Firstly, despite the challenges it faced, 'controlled tipping' was successfully established as the main mode of waste disposal, a position that it would hold until the beginning of the twenty-first century. Indeed, only relatively recently has government policy shifted decisively away from landfill. That controlled tipping became so important was partly dictated by the requirement for relatively cheap means of disposal in a period when the *volume* of municipal waste was growing rapidly, controlled tipping underpinned Britain's twentieth-century waste regime. As Zsuzsa Gille has shown, the selection of a waste disposal technology is determined by an array of disciplinary structures and languages, as well as by the materiality of waste itself (Gille, 2007). States operate 'waste regimes' in which both waste and the process of wasting are produced and reproduced materially and discursively. Gille's work demonstrates that political and ideological contexts are critical to the production and disposal of waste. The production and disposal of waste plays a key role in a state's effort to produce and legitimate both itself and its subjects. Between 1920 and 1960, Britain saw the emergence of a particular kind of 'waste regime', one that was founded upon the technology of controlled tipping. This waste regime existed in parallel with, and was an essential prerequisite to, the emergence of the 'throwaway society' (Strasser, 1999; Rogers, 2007).

Gille also observed that waste regimes are contested; they can break down and be rebuilt according to political or other contexts. The hegemony of controlled tipping was certainly unstable. In the inter-war period it was successfully established as a legitimate mode of disposal through the exploitation of particular discursive resources by public cleansing professionals. A combination of land reclamation and bacteriological science suggested that the controlled tip, sealed and superintended by trained cleansing officers could exploit a fuller understanding of

natural processes in such a way as to return waste matter invisibly to its point of origin, the earth. For a time this was a successful strategy in the legitimization of a disposal practice which the same professionals had earlier abhorred. Yet, despite the best efforts of the cleansing officials and others to legitimate tipping as the ultimate, and risk free way of disposing of refuse, when actual practice came into contact with the local spatial and ecological imagination it sparked resistances. Ultimately an evolving conception of amenity conflicted with the utilitarian compulsion to make tipping a productive process of land reclamation. Arguably, these contradictions were inscribed in the meanings of waste. As polluting matter waste was a threat to both health and the environment, but as cast-off, abject matter it was a possible resource, ripe for gainful employment. For a time controlled tipping appeared capable of reconciling these demands, but as understandings of amenity and natural beauty changed to include 'waste' spaces as desirable environments within which to spend leisure time, the role of controlled tipping in land reclamation rapidly became a threat to access to nature. Despite their power, therefore, both professional and scientific discourses were continually being challenged to renew themselves by the transformation of the discursive environment around them. Waste regimes, as Gille suggests, and the 'Refuse Revolution' itself, should not be conceived either as static and impermeable, or progressive and enlightened, structures, but as political formations subject to contest and change.

References

- Allen M, 2007 *Cleansing the City: Sanitary Geographies in Victorian London* (Ohio University Press, Athens OH)
- Ashford E and Baker H, 1933 *Rural Refuse and its Disposal* (SCAPA, London)
- Carter E, 1921, "The Collection and Disposal of Town Refuse", *Journal of the Royal Society for the Promotion of Health*, **42**, pages 38-9
- Clark J, 2007, "'The Incineration of Refuse is Beautiful': Torquay and the Introduction of Municipal Refuse Destructors" *Urban History*, **34**, pages 255-77
- Cooper T, 2008, "Challenging the Refuse Revolution: War, Waste and the Rediscovery of Recycling" *Historical Research*, **81**, pages 710-214

- Coulton C, 1994, "Chicago's waste lands: refuse disposal and urban growth, 1840-1990", *Journal of Historical Geography*, **20**, 2, p. 124-142.
- Dawes J, 1929 *A Report of an Investigation into the Public Cleansing Service of the Administrative County of London* (HMSO, London)
- Douglas M, 1995, *Purity and Danger: An Analysis of the Concepts of Pollution and Taboo* (Routledge, London)
- Flintoff, F, 1968, 'Refuse, scrap and litter', *Journal of the Royal Society of Arts*, **116**, pages 750-70
- Gandy, M, 1993 *Recycling and Waste: An Exploration of Contemporary Environmental Policy* (Ashgate, Aldershot)
- Gille Z, 2007 *From the Cult of Waste to the Trash Heap of History: The Politics of Waste in Socialist and Post-Socialist Hungary* (Indiana University Press, Bloomington IN)
- Goodrich W, 1903 *Economic Disposal of Towns' Refuse* (P.S. King, London)
- Gregson N, Metcalfe A, Crewe L, "Identity, mobility and the throwaway society", *Environment and Planning D: Society and Space* 2007, **25**, pages 682-700.
- Hamlin C, 1988, "William Dibdin and the idea of biological sewage treatment, *Technology and Culture*, **29** (2) pages 189-218.
- Hamlin C, 1998 *Public Health and Social Justice in the Age of Chadwick* (Cambridge University Press, Cambridge)
- Honigsbaum, F, 1970 *The Struggle for the Ministry of Health*, LSE Occasional Papers on Social Administration, **37**
- Jones B, 1934, 'Is controlled tipping safe', *Municipal Journal and Public Works Engineer*, **17**, pages 1133-4.

- Jones, B and Owen, F, 1936 *Some Notes on Scientific Aspects of Controlled Tipping* (City of Manchester)
- Linney A, 1934, "Rubbish dumps on Essex marshes", *The Observer*, 7 October, page 31
- Luckin B, 2000, "Pollution in the city", in *The Cambridge Urban History of Britain, Vol 3: 1840-1950*, Ed. M Daunton (Cambridge University Press, Cambridge), pp 220 – 1
- Matless D, 1998 *Landscape and Englishness* (Reaktion, London)
- McLauchlan E, 1936, 'The disposal of house refuse by controlled tipping', *Journal of the Royal Sanitary Institute*, **57**, pages 1-10.
- Manchester Guardian* 1932, "Mountains of rubbish", 3 Sept, page 11.
- Manchester Guardian* 1953, "The CPRE", 6 June, page 7.
- Manchester Guardian*, 1954a "Didsbury protest at tip plan", 12 January, page 5.
- Manchester Guardian*, 1954b "Didsbury disdains 'amenity' of rubbish tip", 20 January, page 12.
- Manchester Guardian* 1956, "Floods reopen dump controversy", 31 August, page 14.
- Melosi M, 1988, "Technology Diffusion and Refuse Disposal: The Case of the British Destructor", in *Technology and the Rise of the Networked City in Europe and America* , Eds J Tarr and G Dupuy (Temple University Press, Philadelphia)
- Ministry of Health, 1930 *Public Cleansing: Extracts from the Annual Report of the Ministry of Health for 1929-1930* (HMSO, London)
- Ministry of Health, 1930 *Report of the Departmental Committee on London Cleansing* (HMSO, London)

Municipal Journal 1915, “Refuse collection and disposal”, 11 June, page 527.

Municipal Journal 1922a, 12 May, page 337

Municipal Journal 1922b, 4 August, page 546.

Municipal Journal and Public Works Engineer 1925, “Scavenging of towns”, 30 January, page 159.

Municipal Journal and Public Works Engineer 1931, “Ten years of public cleansing in Great Britain”, 24 July, pages 1135-1147.

Municipal Journal and Public Works Engineer 1932a, “The public cleansing world”, 8 January, page 61.

Municipal Journal and Public Works Engineer 1932b, “The public cleansing world”, 5 August 1932, p. 1044.

Municipal Journal and Public Works Engineer 1934, ‘Public Cleansing Service’, 5 January, page 28.

Municipal Journal and Public Works Engineer 1934, ‘Disposal of London refuse’, 24 August, pages 1170, 75.

Municipal Journal and Public Works Engineer 1928, ‘Economy in refuse disposal’, October 26 page 1656

Municipal Journal and Public Works Engineer ‘Economics of Refuse Disposal, April 28 1933, p. 534.

Municipal Review 1930, ‘London cleansing’, August, page 307

Municipal Review 1934, ‘Refuse disposal by controlled tipping’, September, page 387

NA 1922a, *London Refuse Dumping in Outer Areas*, HLG 51/11. Letter addressed to Ministry of Health dated 9 June

NA 1922b, *London Refuse Dumping in Outer Areas*, HLG 51/11. Letter from Tottenham Borough Council to the Ministry of Health dated 22 June

NA 1922c, *London Refuse Dumping in Outer Areas*, HLG 51/11. Transcript of the 'London Refuse' conference dated 29 June

NA 1947, *Refuse Tipping in Rural Districts, 1947-1956*. HLG 51/813. Letter from Sheffield and Peak District Branch dated 7 Nov (signature illegible)

NA 1951a, *Bournemouth CBC: Controlled Tipping of Refuse: Hengistbury Head*. HLG 131/308. Buckinghamshire Federation Women's Institute, Annual Council Meeting of Bucks County Federation dated 25 June 1951

NA 1951b, *Bournemouth CBC: Controlled Tipping of Refuse: Hengistbury Head*. HLG 131/308. Letter from CPRE to Buckinghamshire Federation Women's Institute dated 31 July 1951

NA 1954a, *Holyhead UDC: appeal under s.16 Town and Country Planning Act 1947 against refusal to permit land reclamation by means of controlled tipping at Penrhos Beach*. BD 28/370. Report on the appeal by S.T. Roberts.

NA 1954b, *Holyhead UDC: appeal under s.16 Town and Country Planning Act 1947 against refusal to permit land reclamation by means of controlled tipping at Penrhos Beach*. BD 28/370. Holyhead Residents' Petition (document 4 in the appendix)

NA 1963a *Bournemouth CBC: Controlled Tipping of Refuse: Hengistbury Head*. HLG 131/308. Letter to Bournemouth Borough Council from Lt Col. A.L. Paris dated 13 August 1963,

NA 1963b *Bournemouth CBC: Controlled Tipping of Refuse: Hengistbury Head*. HLG 131/308. Letter to Ministry of Housing from Hengistbury Residents' Association dated 28 August 1963.

- NA 1963c *Bournemouth CBC: Controlled Tipping of Refuse: Hengistbury Head*. HLG 131/308.
Letter to Ministry of Housing from Margaret Joliffe (Area Secretary of CPRE) dated 29 August 1963,
- NA 1963d *Bournemouth CBC: Controlled Tipping of Refuse: Hengistbury Head*. HLG 131/308.
Report of Public Inquiry.
- Oelschlager M, 1993 *The Idea of Wilderness: From Pre-history to the Age of Ecology* (Yale University Press)
- Otter C, 2002, "Making Liberalism Durable; Vision and Civility in the late-Victorian City"
Journal of Social History **27** (1) 1-15
- Otter C, 2004, "Cleansing and Clarifying: Technology and Perception in Nineteenth-Century London" *Journal of British Studies*, **43** (1) 40-64
- Riley M, 2008, "From Salvage to recycling – new agendas or same old rubbish?" *Area* **40**, 78-89
- Romford Times* 1929a, 16 January, page 1
- Romford Times* 1929b, 13 February, page 1
- Rogers H, 2007, 'Garbage Capitalism's Green Commerce', *Socialist Register*, pages 231-253
- Readman, P, 2001, "Landscape Preservation, 'Advertising Disfigurement' and English National Identity, c 1890-1914" *Rural History* **12** (1), pages 61-83.
- Scanlan, J, 2005 *On Garbage* (reaction, London)
- Strasser S., *Waste and Want: A Social History of Trash* (1999).
- Tanner A, 2006, "Dust-O! Rubbish in Victorian London, 1860-1900" *London Journal* **31** (2) 157-178

The Times 1929a, 6 June, page 10

The Times 1929b, 7 October, page 16

The Times 1931, 2 July, page 11

The Times 1949, 6 July, page 2

The Times 1956, 21 March, page 7

Thompson A, 1933 *The Disposal of House and Trade Refuse: The Biology of Controlled Tipping and Other Matters* (London)

Thorsheim P, 2006 *Inventing Pollution: Coal, Smoke and Culture in Britain since 1800* (Ohio University Press, Athens OH)

Walshe E, 'A Village Problem', *Manchester Guardian*, September 1934, page 6.

Wilding P, 1967, 'The genesis of the ministry of health' *Public Administration*, **45** (2) pages 149-168

Wolkowitz C, 2007, 'Linguistic leakiness or really dirty? Dirt in social theory', in *Dirt: New Geographies of Cleanliness and Contamination* Eds B Campkin and R. Cox (I.B. Tauris, London) pages 15-24