Garbage in the City

Mortal Threat or Economic Gain Waste Disposal in Gothenburg, Sweden, 1860–1930

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The purpose of this paper is to offer a few pointers as to why the methods for recycling waste that were employed during the nineteenth century were entirely replaced by flush toilets, incineration and garbage dumps during the 1920s. The study is based on studies of historical sources that relate the story of the development of waste disposal in Gothenburg. This paper attempts to trace the contours of the motive forces underlying this development.

Waste disposal was developed in a field lying between concepts of the danger of garbage and its usefulness. Yet this assertion must be modified. Medical misgivings were boosted by culturally accentuated experiences of waste as unpleasant and morally ruinous. The utilitarian aspects of waste were discussed on the basis of political economic arguments in which a type of recycling was advocated. In reality, the discussion of the value of garbage was often reduced to a question of its market value. Attitudes to growth, social organisation, hygiene and prudery all contributed to develop waste disposal systems in a particular direction.

Keywords: waste-management, recycling, historical approach.

INTRODUCTION

In the mid-nineteenth century, the main aim of improving waste disposal was to deal with a situation of sanitary catastrophe in the cities to ward off a deadly hazard — not simply to the health of individuals, but to society as a whole. Other aspects of waste disposal were subordinated to the medical aspects.

This did not, however, mean that waste disposal didn't have other meanings and other effects than the purely sanitary. The sanitary project functioned as a model of how to control the city socially and physically (see Schmidt & Kristensen, 1986). Control would partly be attained through legal and organisational measures and partly through technology and medicine. Boards of health, regulations and building norms, municipal responsibility for garbage disposal and water supply, the sewerage system, waste management techniques and hospitals were all to be found on the programme. Urban planning and housing regulations were also important tools. The circulation of air in the city and its buildings had to be increased, sources of pollution were to be removed, while overcrowding and cramped accommodation ought to be reduced.

The effect of sanitary projects on the design of the town extended beyond purely technical measures. There were attempts to create a special design for the technical solutions, particular aesthetics, with which we are familiar through the history of architecture and town planning. Buildings with many and large windows were erected, special gutters and drainpipes at the base of roofs were added, streets were lined with trees and parks were laid out, entire sections of the town where the buildings were tightly clustered together were demolished to make way for broad avenues to improve the circulation of air and a drainage network was built. There is cause to talk about hygienic architecture, in the same way as we nowadays speak of ecological architecture and urban building.

Towns were organised so that it would be possible to keep them clean and places for different kinds of waste disposal were regulated virtually to within a metre. Collection areas and transport systems were carefully designed. Within the home, the chamber pot was moved out of the bedroom, after the advent of special rooms for toilets. It was not simply a question of the specialisation and location of individual rooms. In addition, they had to be placed in a particular order in relation to one another, at the correct distance and with appropriate connections. Urban waste disposal was included in the organisation of modern society and played a role in the zoning and subdivision of the town. Waste disposal became one of the most important elements of the urban hygenic project.

The background to this article is my belief, as stated above, that the choice of waste disposal technology had a significant impact on the design of the physical and social space of the city. In what follows I intend to argue that the choice of waste disposal techniques was not made merely on technical and hygenic grounds, and I give a few representative examples to this. It is apparent that even economic, cultural and aesthetic considerations affected the choice of a hygenic infrastructure and, thereby, the design of the town.

The text is based on a historical examination of the development of waste disposal in Gothenburg from 1864 to 1930 published as *Smutsguld och dödligt hot* ([Filthy lucre and mortal threats], Wetterberg & Axelsson, 1995). This book offers an overview of primary historical material and of the international development of waste disposal techniques. Where no other source is mentioned, the information is drawn from this book.

In this paper, I have chosen to avoid too much detail and instead to concentrate on a few angles of approach to the underlying motive forces behind the choice of waste disposal technology.

HAZARDS AND BENEFITS

Nineteenth century waste disposal in Gothenburg, and in many other cities in Europe, was based on the principle that waste should be, and could be, reused. Later this principle was abandoned. This text is an attempt to understand why.

How should we reason in order to understand the choice of waste disposal technology? Garbage was both hazardous and valuable. This concept was the starting point of every choice of waste disposal technology in the nineteenth century. But *how* hazardous and *how* valuable was the garbage? On this point, opinions differed. In my view, it is fruitful to study the choices of technology that were made on the basis of assumptions of the hazards and benefits of garbage, as long as we do not believe that the choice of technology was a question of neutral optimisation of techniques.

In the first place, hazards and benefits, in the sense in which we are discussing them here, cannot be objectively determined; they are concerned with what *assumptions* were made about hazards and benefits. These were, in turn, affected both by the state of knowledge at the time (for instance on medical questions) and by factors that were more socially and culturally influenced.

Dirt and refuse were not only medically hazardous. Dirt was also a threat to culture and the social order. It was the lower classes, the lazy and unemployed population, who were dirty and smelly. Many maintained that dirt was a sign of immorality (see Johannisson, 1990). Such attitudes affected sanitary reforms. That the organisation of waste disposal was also affected by prudish demands which extended beyond medical needs, is exemplified by the fact that for many years refuse could only be collected at night, when nothing could be seen. In Gothenburg, daytime collection was not permitted until 1912, despite lengthy and repeated complaints about disturbed sleep, inefficient night work and a poor working environment for the garbage collectors.



Figure 1 Work team for the production of fertilizer from night soil. In the background are the simple sheds used for drying the night soil. This method for producing a sellable product was used for about fifty years.

> Photo: The Gothenburg Waste Authority, the Gothenburg City Archives.

Even the use value of the refuse could be viewed from several perspectives. Farmers had one opinion of fertiliser manufactured from nightsoil.

Businessmen and entrepreneurs took another view. "Get rich on rubbish" was a slogan used both then and now. Every year, new private refuse collection firms were started and hundreds of patents were registered annually for different methods of preparing fertilisers.

Secondly, in addition to the perspective of refuse being both hazardous and useful, we must add political and ideological attitudes to understand why different techniques and organisation were chosen.

What regulations and economic burdens would it, for example, be possible to lay on the owners of private companies? To what extent should cities, through public authorities, become involved in practical tasks and business enterprises? Was this not best handled by private initiatives and entrepreneurs?

Such questions were hotly debated and in Gothenburg it did not become compulsory to use the municipal garbage collection services until 1913. By that time, the reform had been examined and debated for over sixty years (Abersténs, 1923).

Several arguments advocating the principle of recycling were put forward.

NINETEENTH CENTURY ARGUMENTS FOR RECYCLING

The national economy was the starting point for a *thrifty aspect*. It was also based on concepts of the natural order of things and methods that were in harmony with nature. In practice, however, short-term economic aspects became more important. Words like *profitability* and inexpensive were used to advocate collection of latrine waste instead of flushing it away with water. The risk of *water contamination*, which was already a factor in the cities of Europe, was also an argument in favour of refuse disposal based on collection and recycling.

Victor Hugo advocated thrift and recycling in his description of the dark mysteries of underground sewers in France in 1862 (Social outcasts). According to Hugo, 25 million francs were flushed through the sewers from Paris alone. Altogether, he said, French rivers deposited half a billion francs in the Atlantic. The valuables which Hugo was referring to were to be found in the human "excrement" that was shown to be the most fertile and fruitful of fertilisers, "filth" that Hugo regarded as "lucre":

What is done with this filthy lucre? It is swept into the abyss! At great expense, entire fleets of ships are sent to fetch guano from the fulmar and penguin at the south pole, but incalculable amounts of the stuff of wealth, which is at hand, is cast into the sea (Hugo, 1863).

Victor Hugo was not content with pointing out the wastage — the profits that were lost but drew more farreaching conclusions that criticised society. In cultures that utilised their filthy lucre, like China, the land continued to be fertile, while cultures that had used sewers had collapsed. In Rome they had "swallowed the entire welfare of the Roman farmer".

The perspective advocated by Victor Hugo would today be called a recycling perspective. Yet it was above all an *economic* recycling aspect, an economising with resources. Hugo was not alone. In 1877 the professor of hygienic theory, Elias Heyman, went so far that he asserted that often it was the concept of the importance of waste for agriculture that determined which method of waste disposal was selected.

Those who were interested in waste disposal issues from a hygienic point of view were critical of those who allowed the utilitarian aspects to affect the choice of waste disposal system. Nevertheless, as long as it was profitable to take advantage of the city's nightsoil, the matter seemed to be clear, since the excrement's hazard to health could hardly be more efficiently avoided than by mixing it with earth. "In the great thriftiness of nature, economy and hygiene appear thus to go hand-in-hand to attain two important goals" (Heyman, 1877).

Thus Heyman reduced the discussion of filthy lucre to a question of the market value of waste. It was from this position that the debate was conducted during the 1870s and 1880s. The principled political economic and moral views expressed by Victor Hugo gave way to a more pragmatic position.

FOCUS ON PROFITABILITY

In Gothenburg in 1864, a collection system was chosen which involved subsequent processing of nightsoil and garbage into saleable products. The work was — by chance — started only a year or so after Victor Hugo's novel was published in Swedish. Belief in the value of the filthy lucre was great, as so often during the nineteenth century, and the plan was to finance collection from sales. Free collection, however, soon led to bankruptcy. Work on nightsoil cases and collection was expensive and it was difficult to sell everything that was collected. The city was forced to subsidise the fees paid by building owners and paid for more than a third of

the real costs of collection.

The difference between the theoretical value of nightsoil fertiliser and its sales value was great. An adult person annually passed nutritive matter valued at six kronor (1890s). Only about half of this could be collected and it was often sold for less than one krona (Almquist, 1883 & 1897).

Yet. even if the price was relatively low and one could hardly talk of profits in this context, it was not possible to ignore this income. In 1885, sales of garbage and latrine powder accounted for over 40 per cent of the total expenses of the waste disposal system (Almquist, 1892). Towards the end of the 1890s, this income was still a strong argument against flush toilets (Bjur, 1988).

MODERNISATION OF RECYCLING TECHNOLOGY

By the turn of the century, the prerequisites for the treatment of city waste in Sweden had changed. The practical recycling solutions were no longer so practical since the amount of litter in the form of cans and bottles had increased and made it difficult to sell kitchen waste, as the organic component was decreasing. Nightsoil and powdered manure had difficulty in competing with artificial fertilisers. The increasing amounts of household refuse entailed an increase in the problems of transporting it in the city and, in addition, it had to be freighted longer distances.

In the second decade of the twentieth century, the new problems were to be met by a thorough modernisation of waste disposal tech*niques*, with chemical treatment, mechanisation, large scale operations and new transport techniques. An industrial recycling plant was built on the outskirts of Gothenburg.

Figure 2 The garbage is collected on a litter and emptied onto a horse-drawn cart on Kungsportsavenyn in Gothenburg in 1922.

> Photo: The Gothenburg Waste Authority, the Gothenburg City Archives.

From barges on the river, nightsoil drums were transported on conveyor belts into the building

in which they were emptied. Then the receptacles were transported into the factory building



where the waste was heated while workers stirred in chalk into a sealed system. The nitrogen that was emitted as a gas was piped to a sulphuric acid bath from which ammonium sulphate was deposited, a compound rich in nitrogen. Both the dried nightsoil mixed with chalk and the ammonium sulphate were packed in sacks, loaded onto railway cars and sold as fertilisers.

Household refuse was also treated in a new way. Households did the initial sorting in separate containers for pigswill and other refuse. After the garbage was collected, it was sorted once more on the loading dock before it was transported on barges to the recycling plant. What could be used as fertiliser was transported immediately to farmers without first being turned into compost, valuable metals and other cast-offs were sold separately, and less valuable rubbish was loaded onto barges and used as filler material.

The pigswill was taken to a separate factory building where it was steamed before being pressed through pipes directly to waiting pigs. The municipal waste disposal department's pigsties held 1,000 animals and several litters were sold each year (Abersténs, 1923:442).

The nightsoil factory was meant to solve the problems of emptying latrines and separation was regarded as a perfect solution to the question of household garbage. The problems entailed by transport, leakage and circulation were meant to become a thing of the past. Once again, crass economics became a significant motive force. The treatment of waste was expected to be profitable! (Documents from the municipal council of Gothenburg, 1912:90, pp. 27 ff.).

RECYCLING IS DISMISSED

The plant was completed and came on line in 1918. Ten years later it was, however, already largely phased-out, being replaced by incineration, landfills, garbage dumps and flush toilets. The new director of the city's waste disposal department had done some calculations in 1927 and discovered that the sales of fertiliser powder were not profitable. He thought that it would be better and cheaper to transport the drums to the waste disposal plant and dump the contents into a large pipe that discharged the waste into the Göta River bed. It would end up in the river in a matter of years in any case, when water-borne sewage had been introduced. He also argued the case for burning waste paper and for windingup the production of pigswill (Anderberg, 1931).

Up to the mid-1920s, municipal waste disposal in Gothenburg was based on the principle of recycling waste. Subsequently, resources were devoted to developing a system based on another principle, simply getting rid of the refuse.



Figure 3 By the late 1920s, the methods for collecting garbage had been rationalized by modern transport technology and studied by Taylorist time and motion methods. A large part of the garbage was tipped on city dumps. Björkdalens garbage dump and the latest advances in transport technology in 1929. Photo: The Gothenburg Waste Authority, the Gothenburg City Archives.

The arguments for recycling were abandoned one after the other. The issues of *national thrift* and dealing with waste in a natural way could never be argued independently of other forces. The entire idea of recycling was counteracted by excessively high expectations of *economic gain*. When they were not realised, the technical solutions came to be regarded as unsuccessful and were replaced, not by more modern technology, but by quite another concept, namely, waste disposal. Garbage should be destroyed, spread out, used as filler or be taken to remote and secluded dumps.

The hazards of water pollution were dismissed in the early twentieth century. It was believed that the large body of water in the river



Figure 5 At the end of 1918, pigs could move into the newly-built pigsties. There was room for 1,000 animals and a special sty for any pigs that were ill. In addition to eating healthy and nutritious food (a gruel made from carefully sorted household waste), the director thought that the pigs ought to enjoy their home. So he insisted that the sties should be light, airy and free from draughts as well as being clean and suitable for the purpose.

would successfully absorb the sewage and optimism was rife when thinking of the technology of the future. A system of a single pipe for all waste water was seen as adequate and it seemed unnecessary to build expensive filtration plants. This meant that it became economically advantageous to install water closets (Bjur, 1988).

From a *hygenic* viewpoint, most people had long regarded flush toilets as the most efficient method. At the same time, experience revealed that a well-run system of buckets could also be effective. The major reduction in deaths as a result of infectious diseases was achieved in the nineteenth century, before the flush toilet had become widely used (Edvinson, 1992).

In addition to the hygenic demands, however, there was also an attempt to find *neat* and *aesthetic* solutions. From the beginning of the discussion in the 1850s to the phasing out of the recycling plant in 1927, one can trace a thread of revulsion at the idea of actually handling the waste. In the predilection for flush toilets, arguments for neat solutions continued to play a major role. They offered a tidy, swift To understand what happened, we must look more closely at what was said and done.

THE DEBATE ON PIGSWILL

In the hunt for the role played by technical, economic, hygienic and cultural conditions on the shift from recycling to dumping, the debate on separation at source and the production of pigswill that started in Sweden in 1915, can give and comfortable way of removing uncleanliness from buildings (e.g. Heyman, 1877).

Even during the 1920s, the aesthetic viewpoints were noticable and not only flush toilets became popular, but also new systems for dealing with household refuse. In 1929, Anderberg, director of the waste disposal department, praised the new garbage trucks with so-called dust-free emptying and added:

"The public should not see the garbage even when the trucks are being emptied. Our present system of collection, with wagons that are more or less covered, where the refuse is visible and is spread by the wind when there is a gale, must be regarded as unsightly and old-fashioned" (Anderberg, 1930).

Yet what happened to Hugo's ideas of recycling and whence did the enthusiasm for natural methods disappear? Was an older and inferior, economically unprofitable system abandoned for one that was modern and more rational?

a few clues. That year, Karl Tingsten, director of the waste disposal department in Stockholm, wrote that it was no longer possible for the public to accept the inconvenience of sorting out leftovers for pigswill, unless raising swine was clearly profitable.

According to Tingsten, the greatest nuisance affected those who sorted the waste. Through the system, building owners' waste was fetched more or less free of charge, thereby making a profit, but for the residents of the flats, sorting the garbage was simply a burden. It was not possible to count on any personal interest in this matter, claimed Tingsten, who thought that it was easy to explain the indifference of the city dweller.

"His life is already so circumscribed by regulations and otherwise so complex that he does not rejoice in finding yet another rule that requires additional attention and thoroughness" (Tingsten, 1915:88).

Tingsten also pointed out that city dwellers had increasingly moved away from nature and that feelings for the "preoccupations of rural life" had diminished, so that interest in sorting pigswill was not very great.

Tingsten thus regarded the sorting of garbage as a cultural question linked to the differences between town and country. He also said that the size of towns was a crucial factor in the equation. In smaller towns, the inhabitants felt more solidarity with their society since they knew more about local politics, while people in large cities were like strangers in their own town. Practical conditions for sorting domestic garbage were also better in small towns where both gardens and kitchens were more spacious. The tall buildings of the cities, the tiny kitchens and crowded courtyards entailed a great deal of extra trouble.

Despite Tingsten devoting so much time to explaining why there was so little personal interest in sorting garbage, he was forced to admit that in those towns where the system had been introduced, it was working really well. The psychological and cultural assumptions permeating Tingsten's article, were refuted by the town physician Wilhelm Söderbaum in Norrköping: Tingsten had not shown that there was any resistance to sorting; his arguments were rather to be regarded as inviting such resistance (Söderbaum, 1915:17).

Tingsten himself had been one of the Swedish pioneers of sorting garbage at source and the reason behind his change of mind was primarily economic. In a comprehensive investigation, Tingsten had come to the conclusion that raising pigs would only be marginally profitable and that it could not justify the economic risks and inconvenience of sorting out the pigswill.

Underlying the low profitability was a subject of contention in the municipalities, namely the right to ownership of kitchen waste from large producers like hotels, hospitals and restaurants. Here the chances of making a profit were greatest. Local authorities in towns with hog farms fought over the right to this waste and case-law supported them (Tingsten, 1915:91, editorial comment). Tingsten threw himself into the discussion and claimed that kitchen waste had economic value for the producers and that they probably took better care of their garbage than the municipalities, which ought not to come forward with their "small private economic concerns" (Tingsten, 1915:92).

THE ECONOMICS OF DUMPING VS. RECYCLING

We can thus note that hygienic and technological arguments did not stand alone, even though they were important. They were supplemented by cultural and social arguments about how waste disposal should be organised.

It is clear, that the economic questions were of great significance. Thus we shall look more closely at what actually happened from this viewpoint. An important argument for recycling was that it would lead to substantial profits. But the recycling plant in Gothenburg was opened at a time of financial strain. From 1912 to 1920 the amount of waste disposal work had doubled, wages had trebled and the eight hour day had been introduced. In addition, the crisis meant that material of all kinds, not least fodder for horses, was expensive. It was necessary to raise collection fees. The hog farms became an economic liability — 1919 was the only year they were run at a profit — and in 1927 the plant was finally closed down (Magnusson 1961:24). This also meant that all sorting of domestic waste products stopped.

What should be done with organic domestic waste if it was not used as pigswill? The possibility of mixing it with other waste to manufacture salable fertiliser garbage lessened. "There is mainly junk with the garbage," Tingsten said in a subsequent interview. Junk could not be thrown just anywhere. In Stockholm some of the junk that could not be incinerated was dumped in the sea. This upset the people of Stockholm, but when he resigned in 1928, Tingsten, the director of waste disposal, made light of the criticism:

"... it is an emotional matter, a question of aesthetics, like everything else here in Stockholm. The collection of waste is not associated with any hygienic hazards" (Dagens Nyheter, 24 Sept. 1928).

To establish garbage dumps and use waste as filler was cheap, but unsatisfactory in the long term. The amount of garbage was too great and handling it was neither "nice nor neat", to quote the new waste disposal director in Gothenburg.

Incineration was the method that reduced the volume and weight of garbage most efficiently

and was regarded as being best from a hygienic viewpoint. By the mid-1930s about one-third of the garbage was burnt and two-thirds were dumped.Waste disposal had been subsidised for many years for hygienic reasons, but from the beginning of the twentieth century it was to be



regarded as a business that in principle should turn a profit. When the recycling plant came on line in 1918, the city's share of the costs for waste disposal were reduced by nearly a third, despite losses incurred by pig breeding.

> Figure 4 Pigs arrive at Skräppekärr on the outskirts of Gothenburg in the 1920s.

> > Photo: The Gothenburg Waste Authority, the Gothenburg City Archives.

When pig breeding stopped, expenses were further reduced.

The incineration of garbage was, on the other hand, an expensive way of getting rid of refuse, so subsequently costs began to rise. Incineration increased the labour intensity of dumping by 72 per cent and the costs by 30 per cent.

Despite the expense of incineration, the cost of every cubic metre of collected garbage fell. This did, however, *not* depend on the methods of getting rid of it, but because *collection* became more rational. The amount of work involved in refuse collection was dramatically reduced. The great savings made in the late 1920s were a result of detailed time-and-motion studies, the motorised vehicles purchased and other modern technology for transporting waste.

From one point of view, the changes of the 1920s can be seen as a logical continuation of the wave of modernisation that characterised the construction of the large recycling plant. For the waste producers — the building owners and households — a personal responsibility for waste disposal was successively entirely exchanged for an economic responsibility: one was not expected to either drive or sort, but one should pay. For municipalities, public interest was gradually replaced by business interests: waste disposal should cover its own costs. Technologically, developments favoured larger scale solutions which became increasingly comprehensive. Hygienically, increasingly great demands were put on neatness in the environments in which people spent time: homes, courtyards

and streets.

Even if there was continuity in development, it is reasonable to speak of the step from recycling to dumping as a new focus for the development of technology and systems. Existing technical solutions were dismissed and were not regarded as capable of being developed, while great faith was put in the future potential of large-scale solutions by the use of waste disposal and incineration techniques. Today it is impossible to determine just how far one might have come economically, if the same strivings for efficiency that were introduced in the late 1920s had been devoted to the recycling systems instead.

The belief in the future, which was expressed in the idea of sorting and recycling in the first decade of the twentieth century, had found a new point of support in incineration, organised garbage dumps and flush toilets. In this way, the demands for making waste disposal invisible in the dwellings and the towns could take another step forward. Not only was the development of waste disposal advanced by the current view of hygiene and cleanliness, but this development in turn contributed to creating new ideals of cleanliness.

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