Early experiences of toilets and sanitation in South African and Finnish cities -a short comparative story

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ABSTRACT

Disposing of waste is as old a problem as civilization, but until the mid-19th century it was mainly a private matter. This timing fits to the situation in South Africa and Finland, too. But what comes to research of refuse management it is still quite rare thing to do. The toilets haven't aroused the interest as much as wells. They never have been as appreciated meeting places as wells, although the well-tended outhouse in many bigger houses or factories offered a moment of rest in between the heavy work. However, the public toilets were a meeting place already in ancient times. Toilets have been despised and in many countries and cultures talking about bodily functions is a taboo. The caretakers of latrines are often seen as the lowest of all people.

The standard of the sanitation and waste management isn't bound in time and to a place as much as to the capability of the society to take responsibility for individuals and their environments. In 1800s and early 1900s toilet was not granted. Even simplest systems were not common and it took many crises before municipal administration began to improve the situation. The basic means to manage refuse and sanitation are simple by structure, but if they are built wrongly or become non-functional, they can endanger the health of both humans and environment.

You could say that the situation in the early days was the same in both countries. Before the proper sewerage systems were built or access to clean water was secured the diseases were constantly ravaging the towns. In South Africa the problem was the availability of the water, in Finland the inadequate purification of the polluted water. In both countries final decisions to build water and sewerage works came in relatively late stage compared to the Western Europe. As latecomers they have been able to learn from the pioneers. In that sense, it is not always bad to be a little bit late.

Even now, in 2006, when networks cover most of city area, in other areas old technical innovations are still in good use. It is not possible and sensible to cover all areas with networks, in less populated areas even these simple solutions might be improvement. This is the case even if water quality is ranked at the top level in the world.

INTRODUCTION

Disposing of waste is as old a problem as civilization, but until the mid-19th century it was mainly a private matter. [1] This timing fits quite well to the situation in South Africa and Finland, too. But what comes to research of refuse management and especially research of toilets, it is still quite rare thing to do. It is much easier to talk and do research from water and simplest technical structure linked to topic, wells. A well is a popular metaphor; it's been subject of poems, pictures and books. The toilets haven't aroused the interest of artists, philosophers or folklorists as much as wells. They never have been as appreciated meeting places as wells, although the well-tended outhouse with several adjacent seats in many bigger houses or factories offered a moment of rest in between the heavy work. Toilets have been despised and in many countries and cultures talking about bodily functions is a taboo. The caretakers of latrines are often seen as the lowest of all people. In poor living conditions the social status of tenants was visible in their location – the further one lived from the toilets the better. [2] In following text we take a short glimpse to history of this discrete subject especially in some cities of South Africa and Finland.

The environmental services are justified in themselves and by expectancy of direct and indirect benefits. Such is the case with direct benefits for health and hygiene and the indirect benefit coming from economic development. The concrete, built infrastructure of the communities is the basis for economic and social systems, which can be vulnerable to environmental changes. A good example of this is the problem caused by the lack of water in South African cities at the turn of the 19th and 20th centuries. In opposite side of the globe, Finland, the solution to the water problem was sought in the late 19th and early 20th century in bigger towns and a few decades later in smaller communities and rural areas. The end result varied from place to place and took its time, but it was found, when problem was big and acute enough and political unanimity was reached to find the needed resources.

When the history of environmental services from all aspects is viewed, it can be said that the solutions for creating them were not as much bound to time and place as to the development level of the community and its attitudes. The successes of urbanization and modernization as well as attempts to create a better environment are closely connected to finding solutions for environmental services.

THE BORN OF THE ENVIRONMENTAL PROBLEMS

At the beginning, the town in its first years and decades is typically like a farmhouse on a grand scale with all the animals. As the city grew, rural living habits disappear and the city began to lose its ties with the surroundings. Nutrients were no longer put back into circulation. Instead, they were removed as refuse and deposited in rubbish heaps, dumps, and later, in the water systems along the sewers. When there was no network of sewers, wells started to become polluted, and there was no longer enough pure water for people. Polluted water and unhygienic living conditions created a favourable environment for epidemics. [3] The same sequence of events occurred in several

European and African cities, and same development also occurred in some South African and Finnish cities. The mortality rate correlates with the health conditions. Typhoid and other diseases were common. In early industrial towns like Johannesburg in South Africa and Tampere in Finland the mortality rate was higher than the average in other cities. Lousy living conditions, badly maintained wells and toilets and the lack of hygiene led to the spreading of the diseases, especially in worker's quarters. [4,5]

In Cape Town in the 1600s and early 1700s streets were unpaved, turning to mud in winter and dust in summer. Regular complaints were made about offal and refuse in the streets. It was slave's duty to empty the chamber-pot; and there were complains that slaves did not do very good job on this matter. Also water carriers were common in the streets. There were some wooden water pipes, but most of the water was carried. From the poorer families, children from ages from 5 to 6 became water carriers. [6,7]

Until an adequate water supply was assured, the sanitary arrangements were primitive. In 1803-04 hyenas and dogs scavenged the streets at night. Householders were expected to remove the dirt, dust, dung and filth from before the houses'. Instructions to ward-masters issued in 1799 demanded a twice-weekly cleaning of streets. Repair of the streets, canals and bridges was often let out to the lowest bidder. Drainage channels connecting houses with the ditch or furrow running along the street were supposed to be covered. What householders usually did was to sweep up the dust into heaps in readiness for the one-horse Scotch carts employed by the contractor for scavenging the streets. When a gale of wind supervened, the confusion would be beyond control. At night coloured labourers called to remove a household's refuse barrels slung on a pole carried across the shoulders of two bearers. The Burgher Councillors were responsible for the sanitation of the town and keeping the streets and watercourses clean. The fiscal and two councillors acted twice a year as sanitary inspectors, but inspections were only partly effective, since they were announced in advance and since householder's responsibility was limited to the area immediately in front of his door. [8,9]

Keeping livestock caused harm to the water and public hygiene in both countries. The lack of good water was dealt with as the "water question". It meant the situation in which the water supply based on wells got into a crisis, when wells dried up or were polluted. From several town newspapers can be found title "Water question" or "Water problem" several times in 1870-1920 and even the stories were almost alike what ever the case town was. (For example newspapers from Finland: *Aamulehti* from Tampere, *Hämeen Sanomat* from Hämeenlinna, *Bårgobladet* from Porvoo etc and from South Africa *Cape Times and Cape Argus* from Cape Town.) Contemporaries were looking for a solution to the inadequate water acquisition from waterworks and to the pollution from the sewer works. The water service system, i.e. an organized water supply and sanitation were considered as an answer to this water question. Long-term planning and different transition phases were needed before the solution was found. Replacing the water acquisition based on wells in the first phase with a so-called protosystem and then with a modern water supply, was a demanding process for the municipalities. [10]

Sanitation problems were solved alongside the water question. Concerning the excrement, it meant usually water flushing. Water closets were seen as a solution to sanitation at the end of the 20th century. The first legally built water closet was

completed in 1883 in the building of the Bank of Finland in Helsinki, capital city. In Finland "illegal water closets" had been constructed even before that. There was a heated discussion concerning the water toilets in Tampere and other cities in the late 19th century. At that time, a WC was built in most blocks of flats in Helsinki, but still in 1906 in many cases an outhouse was preferred. [11,12,13] The health board of Tampere demanded in 1890 that a WC built in one of the downtown houses should be torn down, since it was illegal. The house owner F. W. Gustafsson, claimed: *"closets […] are equipped so that nothing but water can go through them to the city ditches, because there's a cesspool under the closet and there's a 4-inch diameter pipe with a filter."* [14] The same kind of incident occurred in Helsinki a decade earlier, when a businessman, F. W. Grönqvist, had water closets put into his house in 1882. Two years later he lost dispute with city officials, when the senate confirmed the decision of the provincial governor which forbade the running of any impurities to the sewer network. [15]

The first municipal "water pumping installation" in Tampere, and probably in the whole Finland, was founded in 1835. The system was simple and constituted a so-called bucket system. [16,17] The first water-protection regulation in Tampere concerned this system. [18] The rapid growth period in Tampere started a few years later. Polluted water and unhygienic living conditions created a favourable environment for epidemics. The same sequence of events occurred also in several other European cities. [19] Tampere is, however, an exceptional because of the rapid growth caused by industrialisation. Both the problems and their solutions soon became visible. Along with industrialisation the city grew quite rapidly; during the period of 1835–1921 the population rose from about 1,600 to over 40,000. [20]

In 1840 the only water supply in Cape Town was public fountains or the 63 pumps in the town area. Pumps were the centre of social life for Cape Town's poor, as hours were spent collecting the water. Living conditions could be appalling. Most houses were small. There was no sanitation. In the absence of any 'expedient for draining off the filth' it might be 'left to putrify' in a yard or allowed to 'meander across the street'. Inspectors in 1840 reported 'in several cases quantities of rotting fish and human excrement in the very sleeping apartment'. [21]

Smells and filth are rare things to study. There are only a few markings on primary sources about them. Usually they are put under label "Nuisance" like in court cases. These court cases can be found from both countries. In Porvoo, Finland 1656 Anders Simonson demolished his neighbour's outhouse. Anders had noticed that filth leaked from the outhouse to his well and thought the location was improper for a toilet. There was one on almost every plot of land. The court handled the case as damage to property. In 1666 neighbours complained that Per Erikson had filled a well with refuse and "other filth". The accused claimed that he had only used straw and bark. He thought he had a right to fill it, for, after all, he had dug the well. The court took the side of the neighbours, for they all had paid him for building a well. Erikson had to re-open the well and pay the fine. And since 20 burghers used the well, they were ordered to make a protective, one meter-high, earthen wall around the well. [22,23] This method was used later on also in other cities in order to prevent rain and runoff waters from leaking into the wells. Smells and human wastes were also considered as a good thing. In Tampere,

despite all the reforms, the early 20th century city still had its own distinctive smell of muck. Manure was thought to be a good thing, "farmer's gold". And like the old phrase from Tampere goes: *"You'll grow up in the smell of crap, there ain't no bones innit, so just inhale."* [24] Elsewhere in Finland it's shortened: *"One grows up in the smell"*. [25]

In Durban new bishop Colenso described the conditions of the town in 1850s: *"A greater evil in Durban is the water, which is taken usually from wells, that are not sunk deep enough, and consequently abound with decaying vegetable, if not animal matter, and innumerable animalcules and worms… At present, the remedy is to drink rain water, or the water of the Umgeni River, which is brought by carriers a distance of four miles and is excellent. Indeed, had the Dutch founded the town of Durban, as they did that of Maritzburg, they would long ago have had the Umgeni pouring its beneficent streams through every street, and bringing health and cleanliness to every door. How long will it be before the public spirit of Englishmen will achieve this?"* To prevent flooding, the Durban council followed the advice of the engineer, John Milne, in 1856 and erected an embankment above the brickfields. Milne's Drain, as it was called, was led out into the sea. This scheme drained off water for years and made access to Durban easier. Furthermore, it improved the town's sanitary condition. [26,27]

In Grahamstown in 1887 water were conserved in five reservoirs. Water was distributed by water leadings to houses and stores. The sanitation was fairly good. The cesspool system was replaced by the pail system; the sewage was removed and covered up with earth. [28] A sanitary engineer was appointed in Cape Town in 1887. Initiation of plans for a drainage scheme in 1888, however, resulted only from pressure from reformers outside the city council. They succeeded in getting parliament to appoint a select committee to investigate sanitation. Committee recommended a comprehensive drainage scheme. [29]

In 1887 in Johannesburg Sanitary Board was elected to govern the town. The provision of sanitary services was one of its duties. It was not easy to discharge this duty. It would have been ridiculous to install drainage and sewage disposal as it was assumed that the urbanization was only temporary. Even after it became clear that Johannesburg is a permanent town, the scarcity of water made any proper scheme of sanitation impossible. The only means of providing a sanitary system was the collection with buckets.

Refuse heaps started to grow as soon as the gold was discovered. In 1888 Sanitary Board imposed charges for the collection of pails and rubbish and slop-water. It was not allowed to run slop-waters into the streets. In every house there was a tank, where such water was to be collected. These tanks were emptied twice a week when a large wagon with several tanks collected the slop-water. Use of this service was compulsory and non-payment was punished by imprisonment. Slightest relaxation in this system would have meant, in the absence of a proper drainage or waterborne sewerage, the danger of a serious cholera or typhus epidemic. First improvement for the situation was when Johannesburg Water Works Co. began to bring clean water to the homes in early 1890s. This brought down the number of typhus, dysentery, diphtheria and scarlet fever incidences considerably. Before that few of the pioneers lived older than 47. [30]

Quite primitive systems can be found also at much later times. For example, in Finland, Asemantausta district in Lahti sets an example of this slow progress. The area was close to the downtown, but still in the 1970's water was fetched from a well, which was connected to the piped water system. A slop bucket was emptied into a cesspool, which was covered and connected to the sewer system. Lahti had water and sewage works already since 1910, but the sewers weren't built inside houses – except in wealthier homes. The most common toilet was the outhouse and the cesspits under them were connected to the sewer system as well. The more flats there were in a house, the bigger the outhouse – each flat had their own toilet, separated from the others by a partition wall. Cesspits were emptied at least once a year and waste was used as fertilizer. [31,32]

Scottish engineer Robert Boyle commented about Johannesburg in 1893:

> *"The sanitary condition of Johannesburg, though not yet all that could be desired, has been greatly improved within the last year or so… The pail-closet system is used. There is a splendid opening here for an improved dry-earth closet, as the system at present employed is very unsatisfactory."* [33]

Sanitary situation in Durban in 1893 was described:

> *"The pail-closet system is used in Durban, but it is proposed to adopt a complete water sewerage scheme which has been prepared by the borough engineer, Mr. J. Fletcher … Pneumatic ejectors will be employed, and the sewage have its outfall into the Bay Channel, where there is a very strong tide or race, which will carry the sewage with considerably velocity out to sea, and clear of the coast."* [34]

Waterborne sanitation was introduced to Cape Town only in 1895. W.T. Olive was appointed as a Town Engineer for the purpose of supervising this. The pipe installation was laid in tunnels hewn through rock and a sea outfall was lead to Green Point. [35] In Durban the effective sewerage system became operational in 1896. Lavatories were provided and there was an outfall for waterborne household sewage, which was discharged into the sea during the first few years of the ebb tide. [36] In the end of the 19th century in Grahamstown every bigger institution has sloop water system and refuses were transferred away from the town. [37]

Only in September 1897 Johannesburg got the Municipal Bill, which made it possible for the sanitary board to make the institutional arrangements for providing reliable services, for instance a good water and sanitary infrastructure. In 1898 the Johannesburg Town Council succeeded preventing the Pretoria Government from selling out the monopoly of sewage disposal in the Town. By doing this there was some chance for solving problem with sewage scientifically. In the turn of century sanitary situation was getting worse and need for water was growing. There were only a few wells in Johannesburg. The Municipality found that if it were to provide the city with services such as sewerage and refuse removal, its labour force required easier access to the city than was possible from the municipal location at Klipspruit. Accordingly permission was granted for the accommodation of African employees in compounds, and in servants' quarters in the backyards. [38,39,40]

ENVIRONMENTAL CATASTROPHE

In the early 1900s in Johannesburg refuse problem was getting worse. For example in 1907 there was a serious problem especially in township of Sophiatown, where since February portion of Waterval farm was used "wrongfully […] as a depositing site for night-soil, slop water and carcases of animals, and that consequently offensive, poisonous and unwholesome vapours and noxious matters issued and proceeded from the site and spread and were diffused […] properties, rendering them unwholesome, dirty and uncomfortable to live in […] and seriously endangering […] health." [41]

The area was situated near public road, Old Krugersdorp Main Road and was used this purpose obviously since 1894. Although in the year 1907 area was a serious health risk, it was something not unheard that of elsewhere in growing cities of the country, and also elsewhere, can be found similar cases. For example in Tampere, Finland in about same time was just exact the same kind of problems. In the year 1900 industrialist W. von Nottbeck wrote letter to the municipal health board considering illegal refuse dump near one of the main causeway to the Tampere:

"[…] there are animal carcasses, human and animal excrement and all kind of filth carried from the town into the pit. Although one might stand dreadful scent from the pit, particularly in the hot summer day, and suffer the biting of thousands of flies and other insects, which get on well there - for the horror of all bypassers […] – one cannot pass by without noticing the health risk which this pit causes to whole region, not least to the town. […] Excrements of sick and healthy people too, are carried to the pit and so this place becomes a departure point to all kind of diseases. And if we take in to the consideration that this place is in the slope towards Lake Näsijärvi, wherefrom city's water intake is and also when snow melts or when it is raining the pit fills with water, which leaks with innumerable microbes to the towns well, one cannot think about it without horror […]" [42,43]

First sewerage system was introduced in Johannesburg in 1903. Between 1903 and 1906 the council spent three and a half million pounds on sanitation and sewerage, storm water drainage, water supply, and other improvements. Only those who have lived in a town of 200,000 souls without adequate sewage disposal and without septic tanks can realise what an improvement the Council effected when at last waterborne sewage was installed. Gone at last were the billions of flies which surrounded the little buckethouses in the backyards, spreading disease and filth. [44,45,46]

In Tampere environmental catastrophe happened in 1915-1916. The high-pressure facility was completed on 1898. But since slow sand filtration was rejected and the outlets of the some sewers were too close to intake pipes, the efficiency of the facility was also its weakness: typhoid fever in 1915-16 spread fast over a wide area aided by the water pipe network. Around 3000 people got the disease and finally, the death of 300 people prompted the necessary decisions to be made. [47]

WHAT AFTER CATASTROPHE?

In the beginning of the 20th century the raw water basin of Tampere, Lake Näsijärvi, was polluted and there were typhoid epidemics. The threat of diseases spreading through water was removed in 1917, when chlorination of water was started. There have been no typhoid epidemics in Tampere since then. The modern system did not, however, include collection and treatment of wastewater. [48] The typhoid epidemic for its part made decision makers examine the question of community and industrial wastewaters. For various reasons it was finally decided not to do anything at that time: it was assumed that the Tammerkoski Rapids could purify wastewater sufficiently.

In South Africa there were bubonic plague epidemic in 1901 in Cape Town, in 1903 in Durban and in 1904 in Johannesburg and Spanish Flu hit the country in 1918. Every one of these could be connected to insanitary conditions. But instead of improving the sanitary situation, the consequence, at least from the plagues, was to removal of the Blacks in the locations. The Black living areas were considered to be as nurseries of infection by white health officials. Many diseases were said to be originated within these districts. Sewage water purification, for instance, came much later.

CONCLUSIONS

When industrialization accelerated the growth of the town, the problems began. The little water there was, was of a poor quality, and usually there was shortages. Poor water quality and insufficient hygienic conditions endangered also humans and environments health. This was also the case in smaller towns. This happened because of the lack of the sanitation and refuse management in South Africa and Finland and also elsewhere.

The standard of the water supply and sanitation isn't bound in time and to a place as much as to the capability to take responsibility for developing the individuals and their environments. In early 1800s and early 1900s even well and toilet were not granted, and people had to rely themselves. Even simplest systems were not common and it took many crises before municipal administration took steps to improve the situation. The basic means to manage with refuse and sanitation are simple. For example the well and the toilet are the most common technical systems in the service of the mankind. They are simple by structure, but if they are built wrongly or become non-functional, they can endanger the health of both humans and environment. [49,50]

In South Africa these problems were severe in history, but cities managed to take steps to improve sanitary situation. First steps were not enough, but they proved that it's better to do something than to do nothing or city dwellers won't survive. In both countries we could find examples how environment effected on the establishment of the facilities. In Johannesburg when a waterborne sewage disposal scheme was started in 1903, they couldn't dig the trenches for the pipes, they had to be blasted by dynamite. [51] In Finland the town of Savonlinna had a same situation. The got the water plant only 1951, because it was situated on a rock. [52]

There are of course important differences. In Finland the population is very homogenous so there has never been race issue as in South Africa. Other point of difference is the availability of water. In Finland towns were born beside water bodies, this was not a case in South Africa. In Finland the factories were established where they could get their power from water. You could, however, say that the situation in the early days were the same in both countries. Before the proper sewerage systems were built or access to clean water was secured the diseases were ravaging the towns. In South Africa the problem was the availability of the water, in Finland the inadequate purification of the polluted water.

In both countries final decisions to build water and sewerage works came in relatively late compared to the Western Europe. They have been able to learn aberrations and discoveries of pioneers [53]. In that sense, it is not always bad to be a little bit late. Even now, in 2006, when networks cover most of city area, in peri-urban and rural areas some old technical innovations are still in good use, toilets and wells. It is not possible and sensible to cover all areas with networks, in less populated areas even these simple solutions might be improvement in both case countries. This is the case even if water quality is ranked at the top level in the world. Real success story in both countries!

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