

# **From Athens 500 b.C to Budapest 1900 a.C.**

## **24 centuries evolution of Solid Waste Management**

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# Athens about 500 b.C.

- ◆ The 5 policemen (astynomoi) of the city-state were also in charge of the street cleaning. The street cleaners were called "koprologues". Cleaning was restricted to the main streets.
- ◆ The collected waste and excrement had to be transported at a distance of 10 stadia (about 2 km.) from the city wall

## Rome (ancient)

- ◆ Rome was a huge city with multistory houses. Street cleaning was performed by slaves.
- ◆ Main use of the garbage was as fertilizer. Part was buried in big ditches.
- ◆ An important part was also washed in to the Cloaca Maxima, which was the underground drainage system, leading everything to the river Tiber

## Rome (medieval)

- ◆ In the rich areas, the dirty works, such as garbage collection, took place from the rear side of the houses, in order to keep the front clean
- ◆ Leonardo da Vinci made a drawing of such a house, showing the rear "dirty" side covered, in order to prevent spreading of the odors

## Rome (medieval)

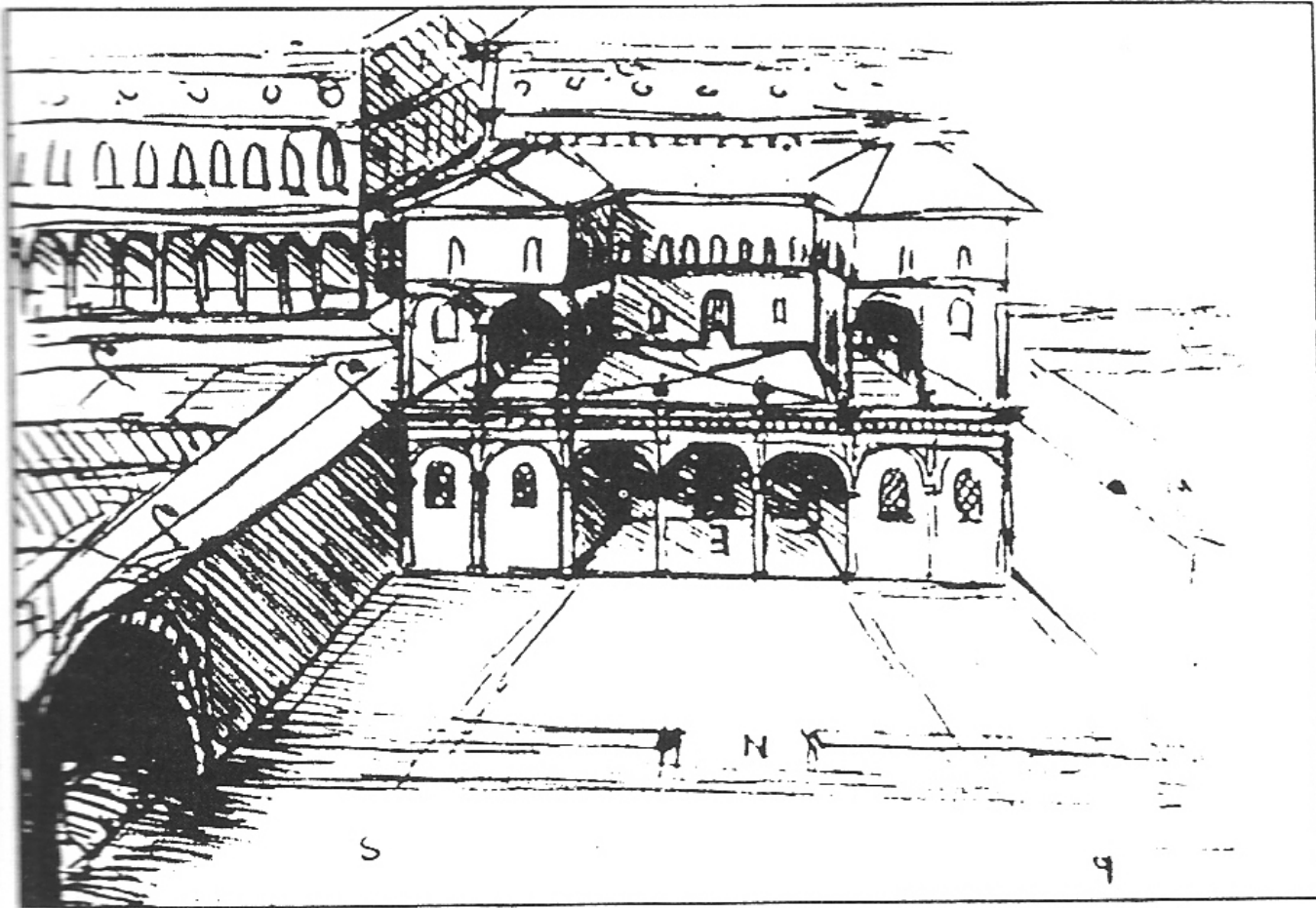


Abb. 45: Handskizze von Leonardo mit Vorschlag zur Trennung in saubere und unsaubere Straßen.

# Paris (medieval)

- ◆ Garbage was thrown to the street from the window
- ◆ Street "cleaning" was performed by swine herds
- ◆ These conditions were a good cause for devastating epidemics
- ◆ From the end of the 14<sup>th</sup> century, the street cleaning was in the hands of privates, who fed their pigs or sold the garbage as fertilizer

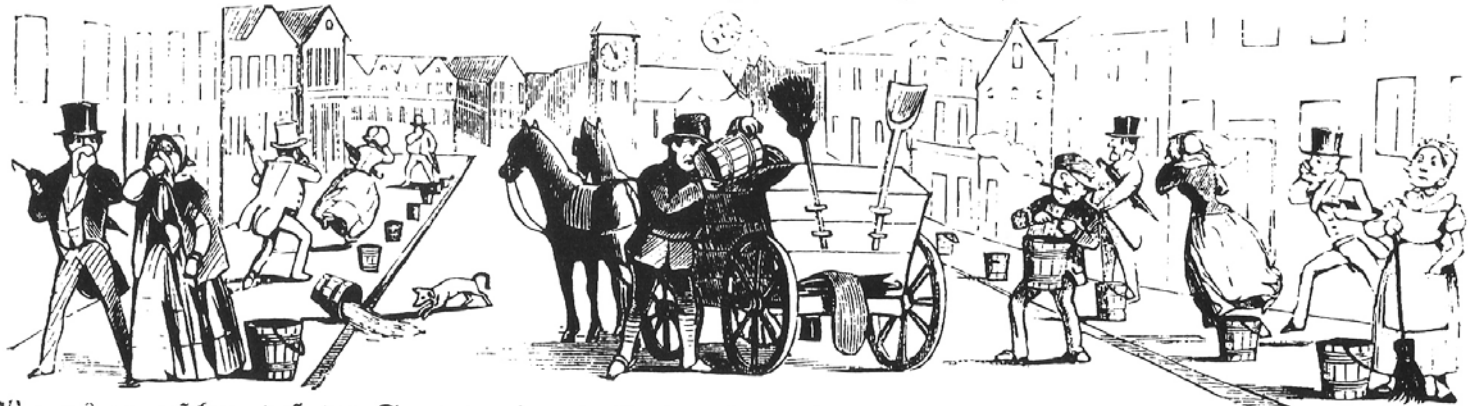
# Prague and other Danube cities

- ◆ The main receiver of the collected garbage was Danube
- ◆ At the beginning of the 17<sup>th</sup> century, there is a general effort in central Europe, to better organize the solid waste management, but evolution is slow
- ◆ The end of the 19<sup>th</sup> century marks the introduction of more sophisticated systems

# Bremen 1850

## Bremen zur Mittagszeit.

Nach einem von dort eingekauften Daguerreotyp.



Woraus zu ersehen, daß der Senat doch noch für den Fortschritt und das Fortkommen der Bürger, forat.

Abb. 79: Bremen 1852: Die Fäkalienkübel wurden von der Bevölkerung morgens früh vor das Haus gestellt, aber erst mittags in offene Abfuhrwagen entleert. Der Gestank war unerträglich (nach Pressekarikatur von 1852).



# Hamburg 1600

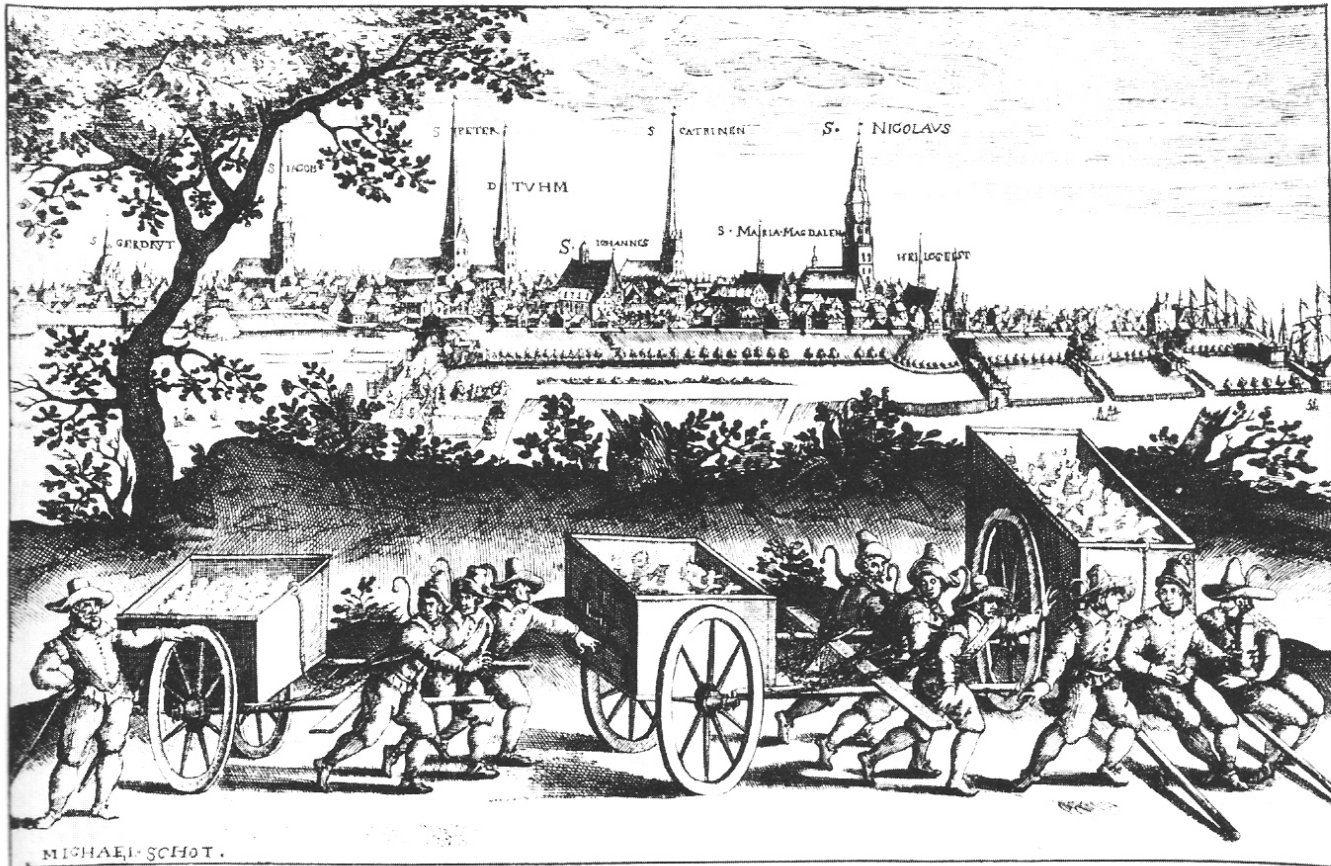


Abb. 50: Hamburg 1609: Gefangene beim Mülltransport mit Schot'scher Karre (zeitgenössischer Stich).

# Vienna 1898

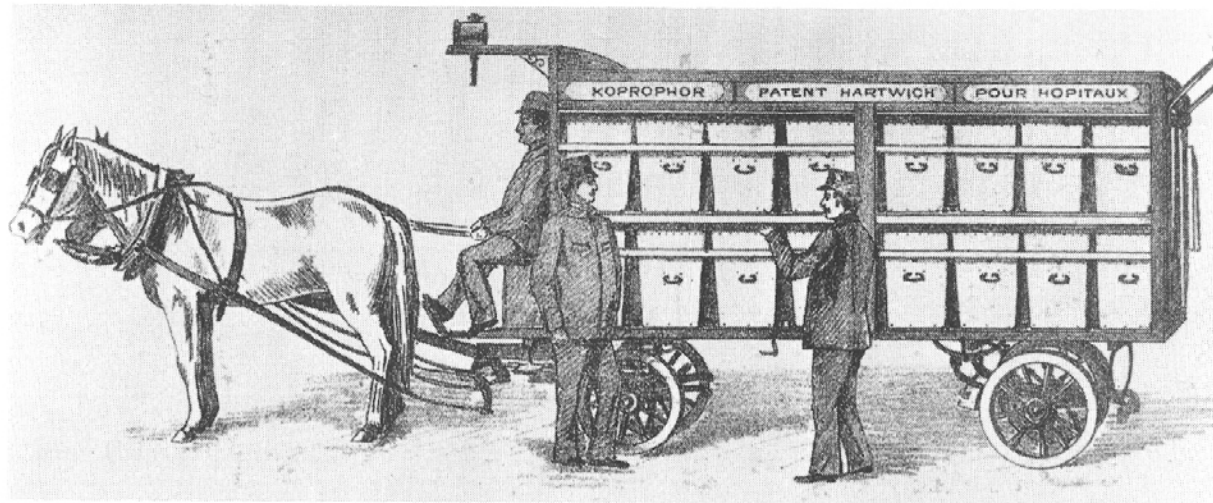


Abb. 115: Wechselgefäß-System „Koprochor“: Wien 1898.

Collection with the use of interchangeable containers

# Munich 1870



Abb. 58: München 1872: Weibliche Arbeitskräfte bei der Straßenreinigung.

**Street cleaning is a women job**

# Vienna 1900 -collection by boat

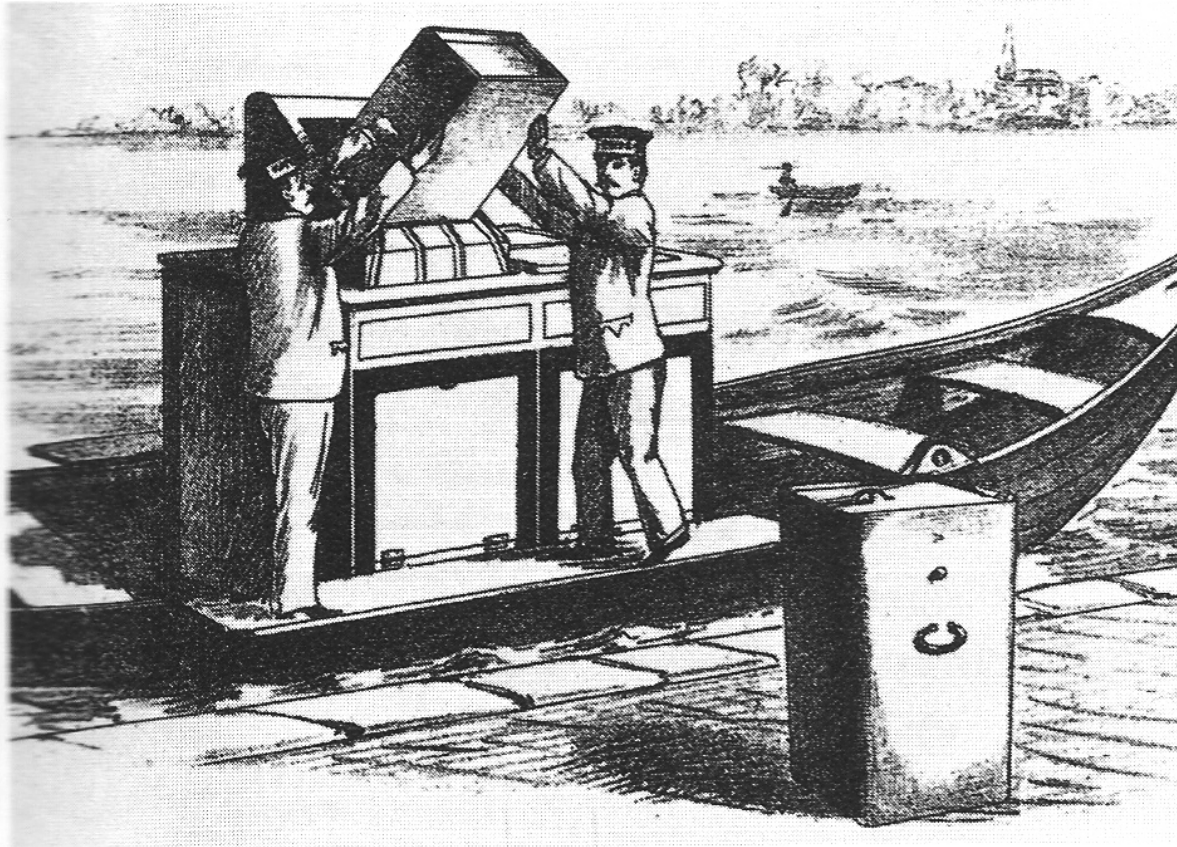


Abb. 63: Vorschlag von Hartwich, Wien 1898: Ausrüstung von Kähnen mit „Koprophor“-Wechselgefäßen für Hausmüll.

# Vienna – disposal in the Danube

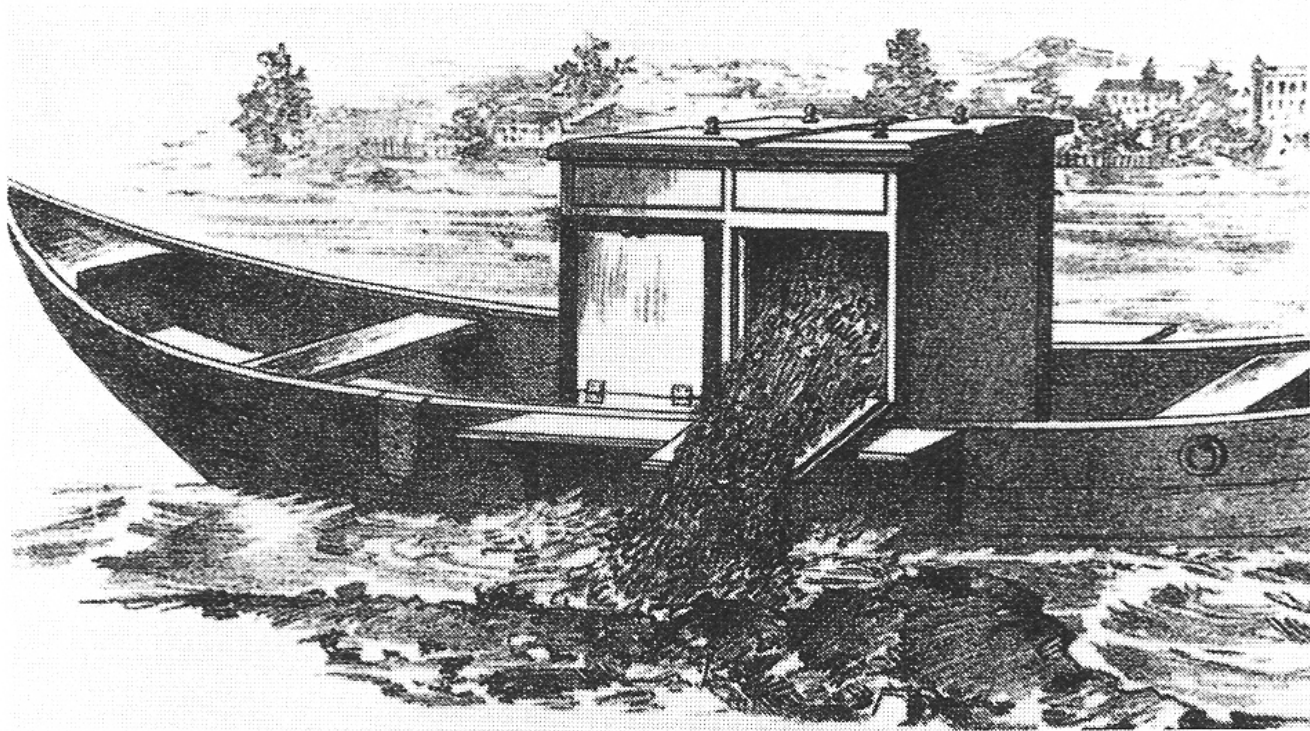


Abb. 64: *Entleerung der Gefäße in die Donau.*

# Collection system "Mirrus" 1901

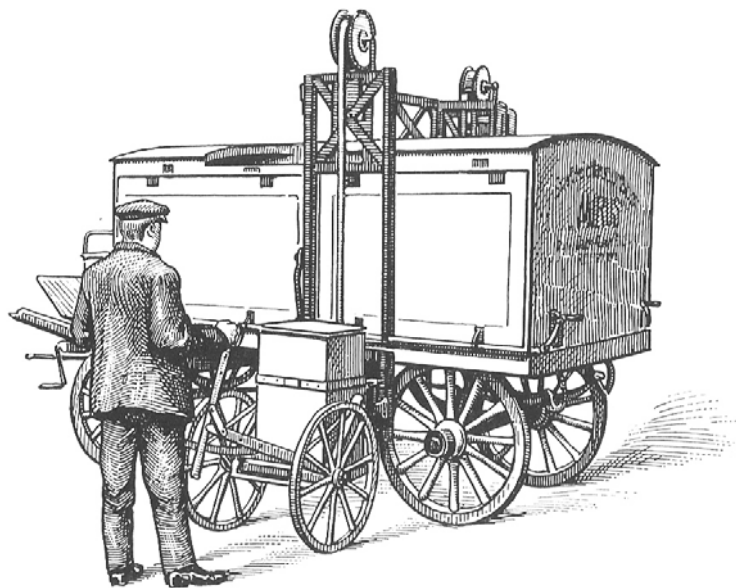


Abb. 116: Müllabfuhr-System „Mirrus“ mit Seitenaufzug:  
1901.

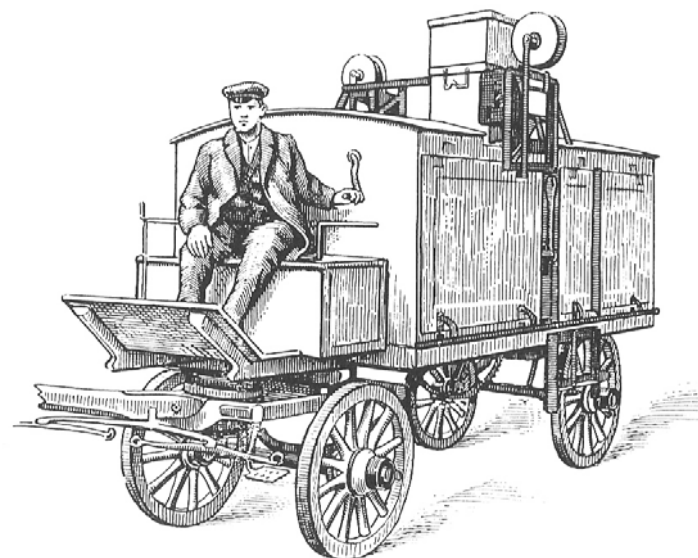


Abb. 117: Müllabfuhr-System „Mirrus“ mit Seitenaufzug:  
1901.

# Collection system "Colonia"- 1910



Abb. 120: Colonia-System als Tonnenumlersystem. Erste Ausführungsform der Schüttung. Probetrieb in Magdeburg 1910.

# Separate collection in the USA

RUBBISH

ASH BIN

GARBAGE



Abb. 163: Dreiteilungssystem: Hofstandgefäße.



# Hamburg - incineration 1895

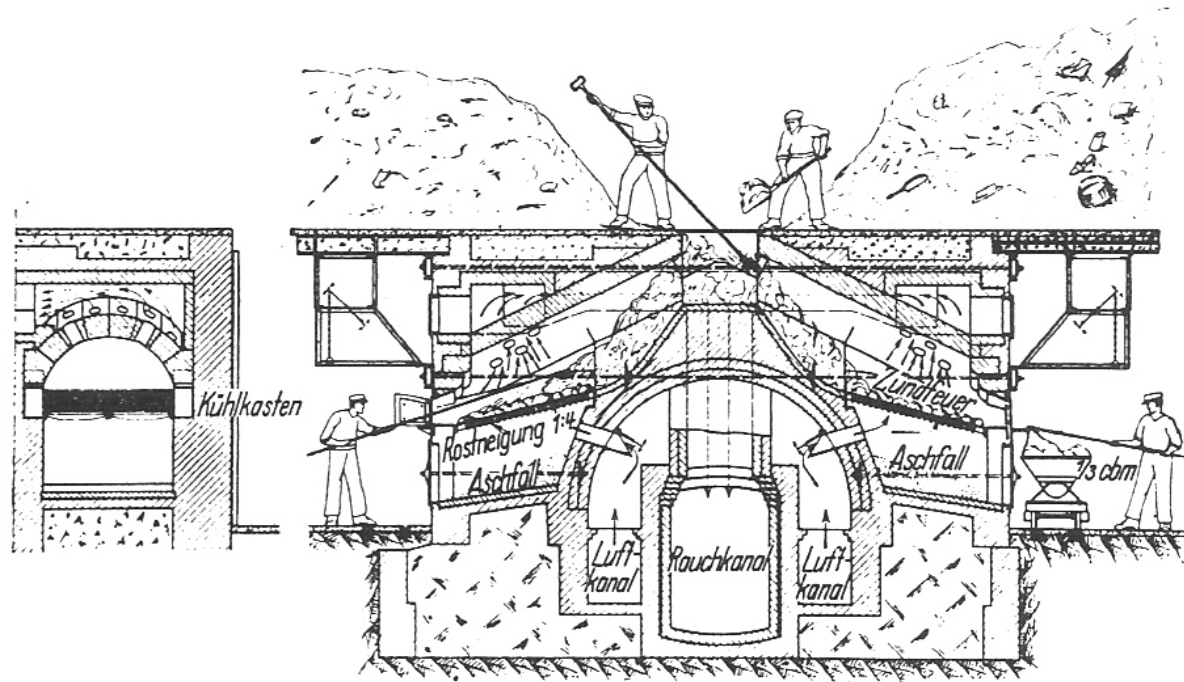


Abb. 92: Horsfall-Spaltrosten: Dieser Ofen wurde 1894/95 von einer englischen Firma als erster Müllverbrennungsofen in Deutschland (Hamburg) gebaut.

# Hamburg - incineration

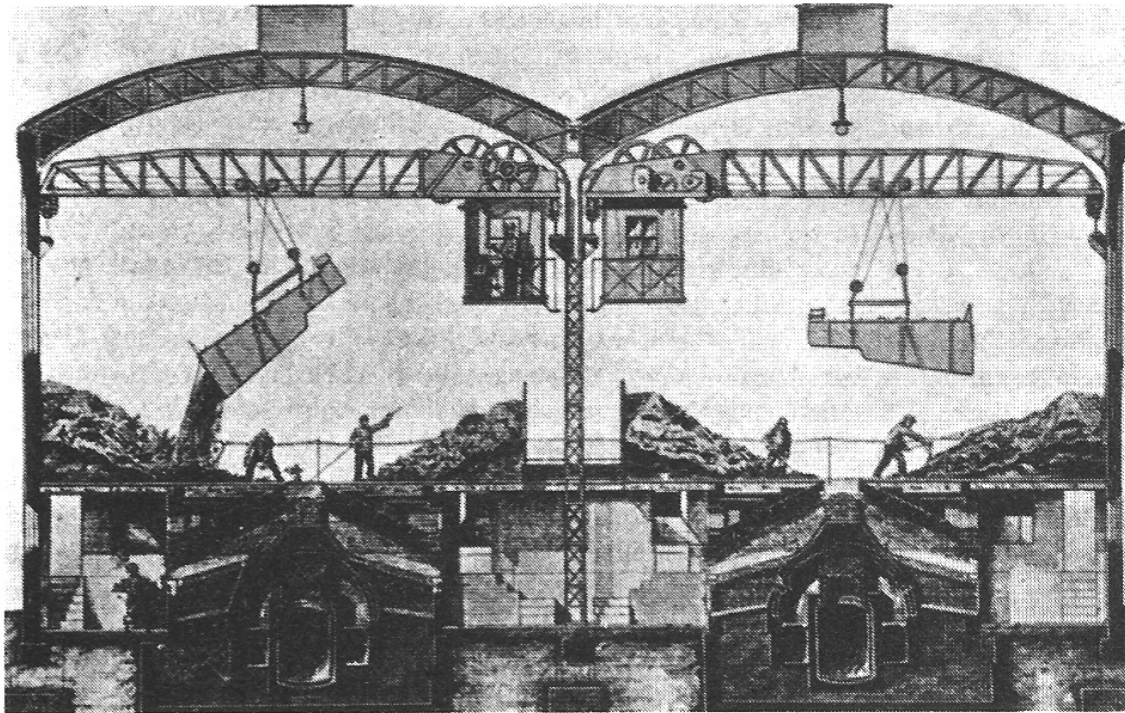
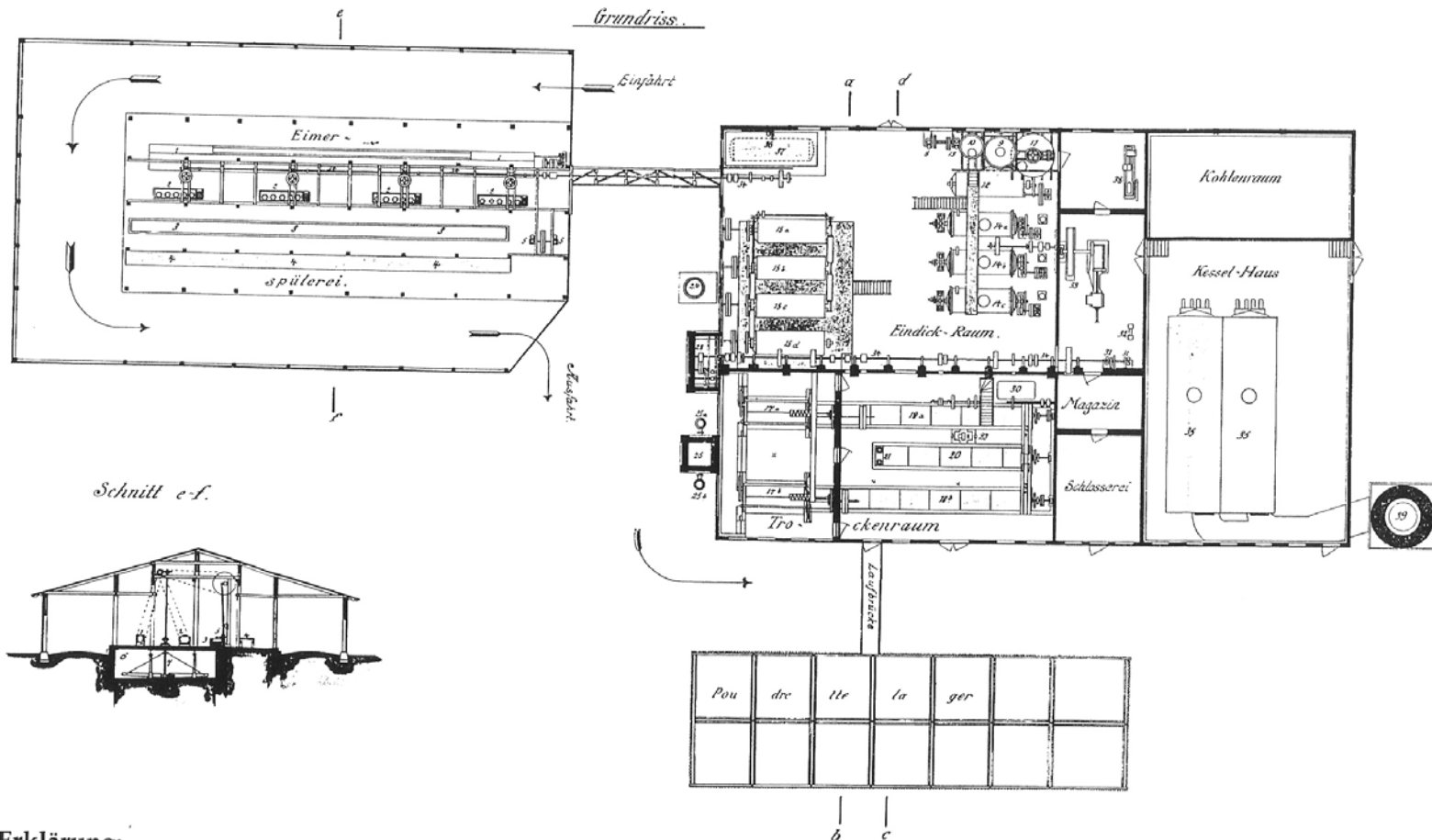


Abb. 93: Hamburg 1895: Verbrennungsanstalt am Bullerdeich, Querschnitt durch die Ofenhalle.

# Kiel 1900 – "poudrette"



Erklärung:

# Budapest 1900 - collection



Abb. 152: Budapest, etwa 1900: Einsammlung des Kehrichts.

# Budapest - separation

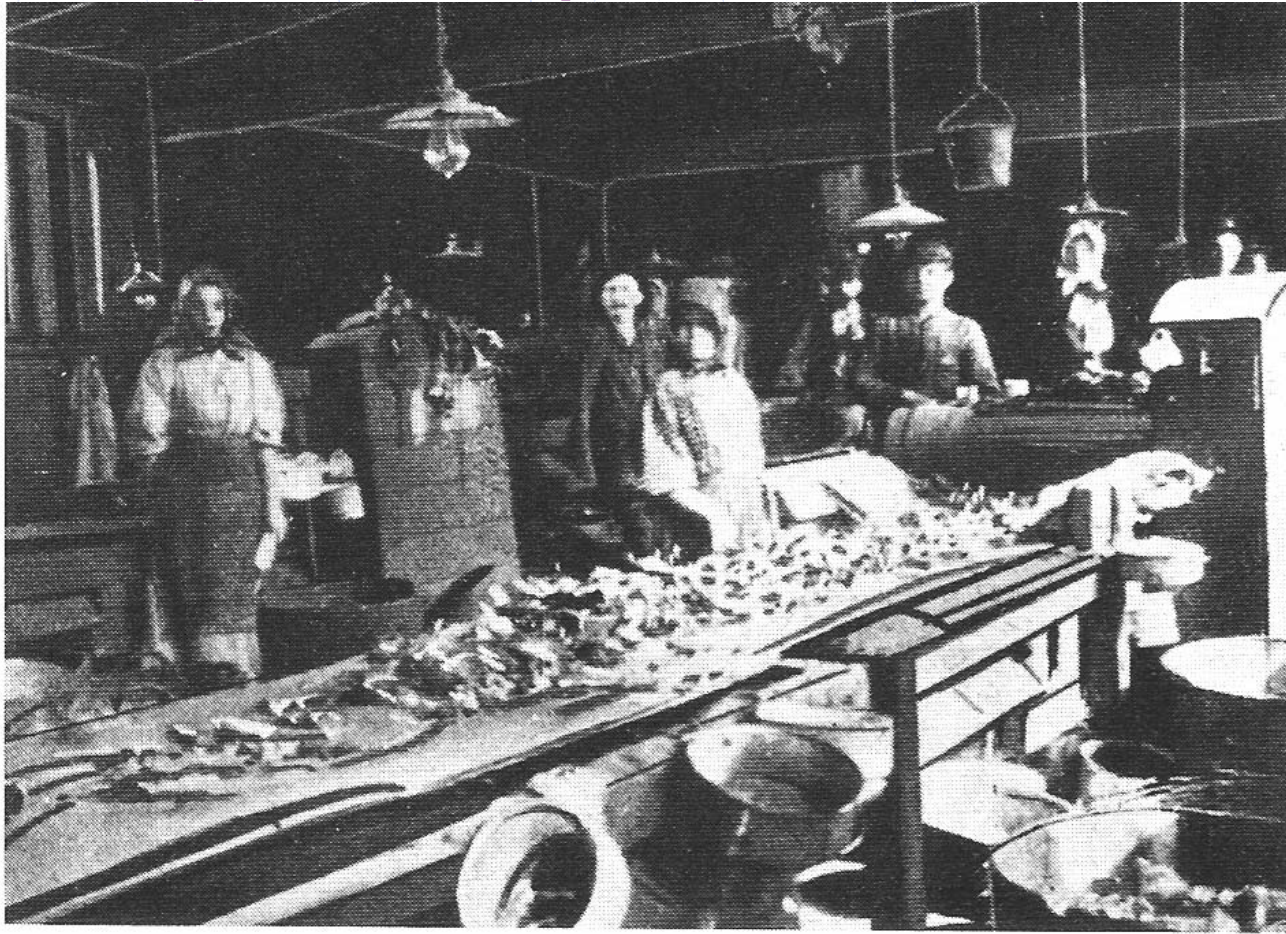


Abb. 154: *Budapester Anlage, etwa 1900: Arbeiter am Sortierband.*

# Budapest 1900 – final products

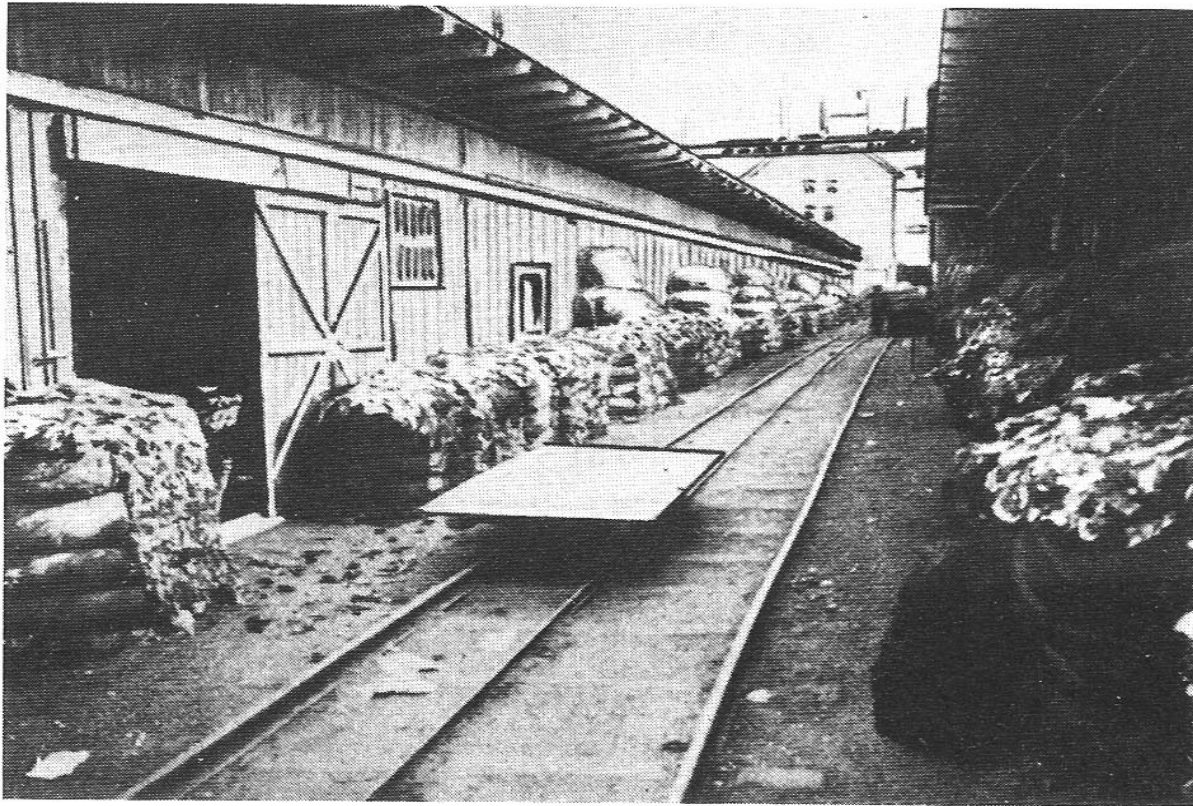


Abb. 155: *Budapester Anlage, etwa 1900: Aussortierte, transportbereite Ware.*

# Budapest 1900

– recovered quantities per year in wagons

◆ Bones	200
◆ Rags	80
◆ Paper	50
◆ Steel	50
◆ Other	10

Garbage as fertilizer

5.000 sold at 27  
crowns per wagon