EIVP
ECOLE DES INGÉNIEURS DE LA VILLE DE PARIS
ECOLE SUPÉRIEURE DU GÉNIE URBAIN

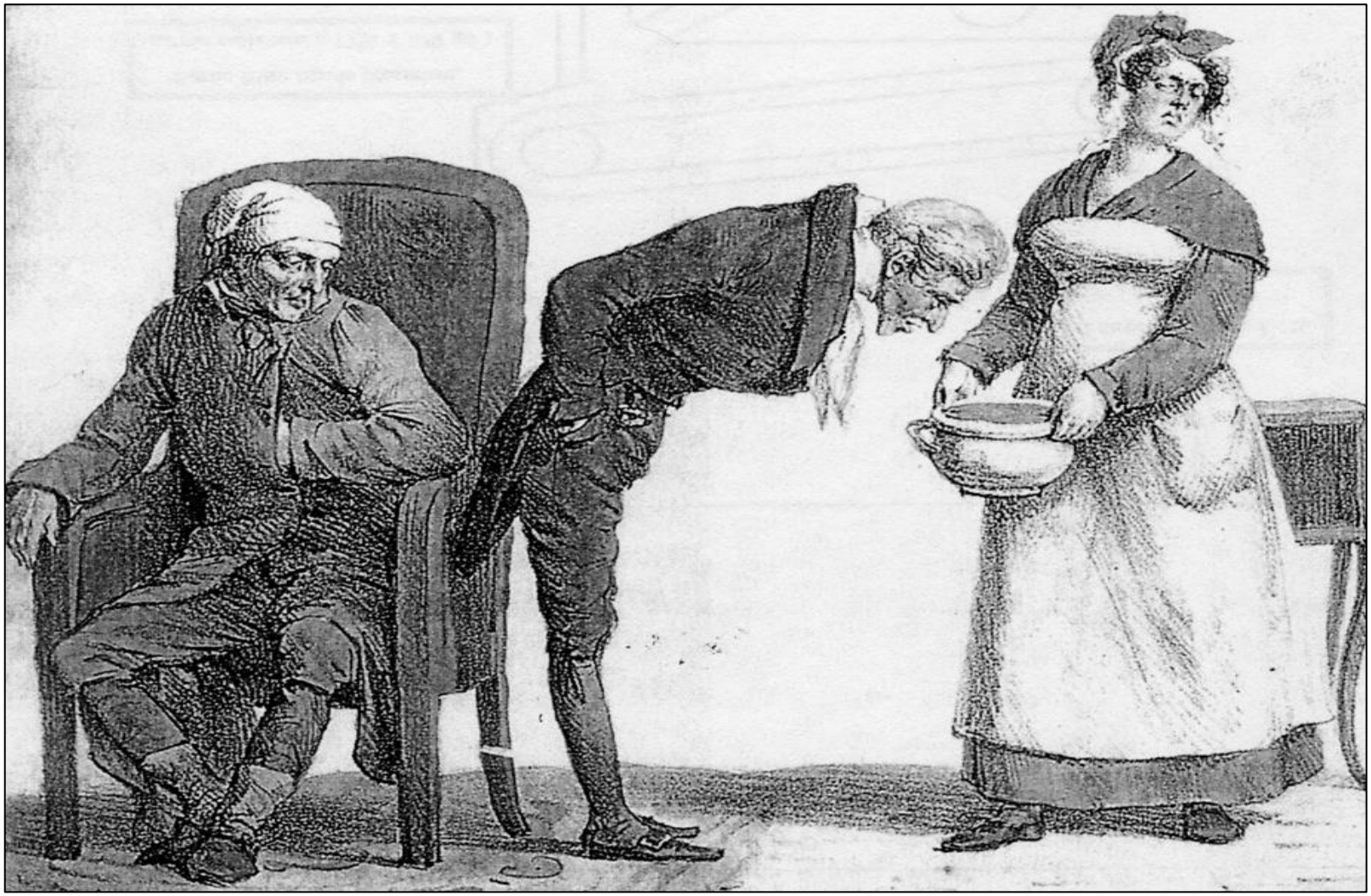
Organic waste management in France : past and current status

sewage, sludge, MSW and biogas

Emmanuel ADLER

Ecole des Ingénieurs de la Ville de Paris

Portrait of an organic Waste Management Analyst



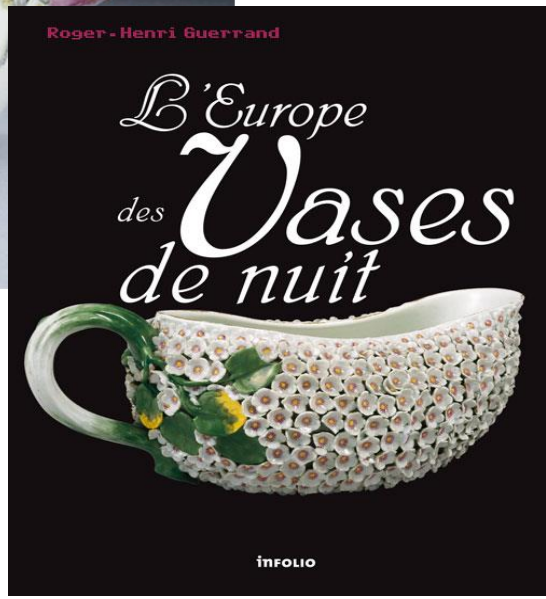
1825

Very old time sanitation

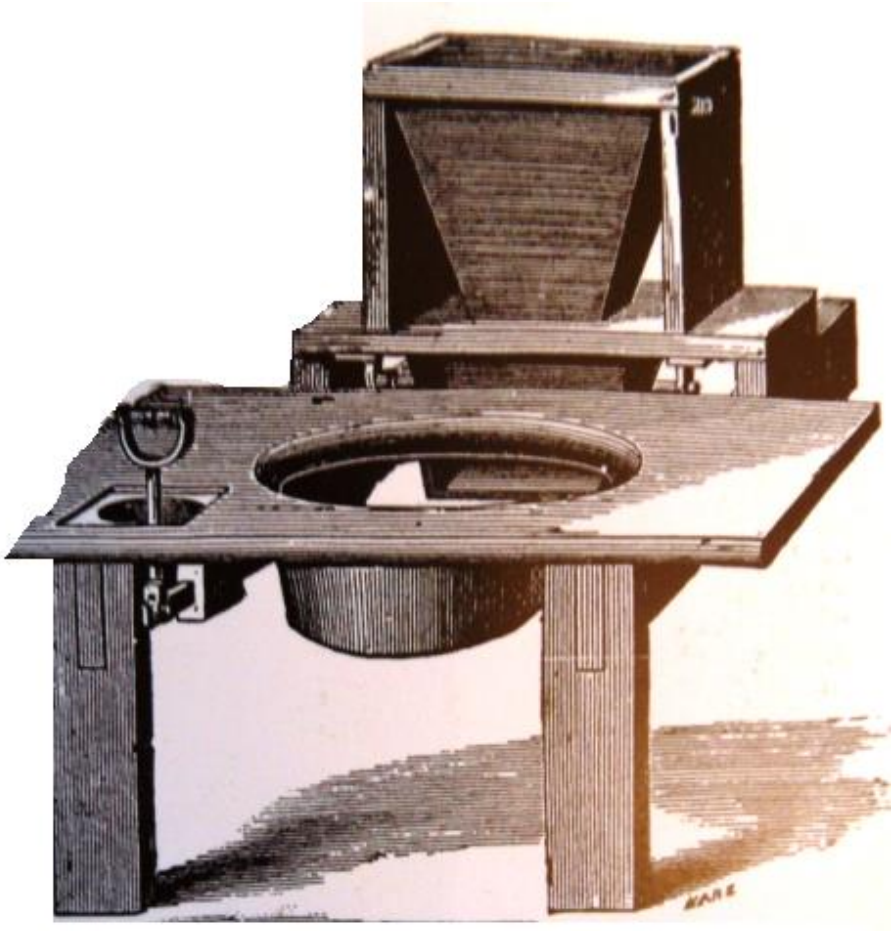
Very simple defecation (in streets)

Ortus sanitatis
Joanna de Cuba, 1491

Simple sanitation (in pots)

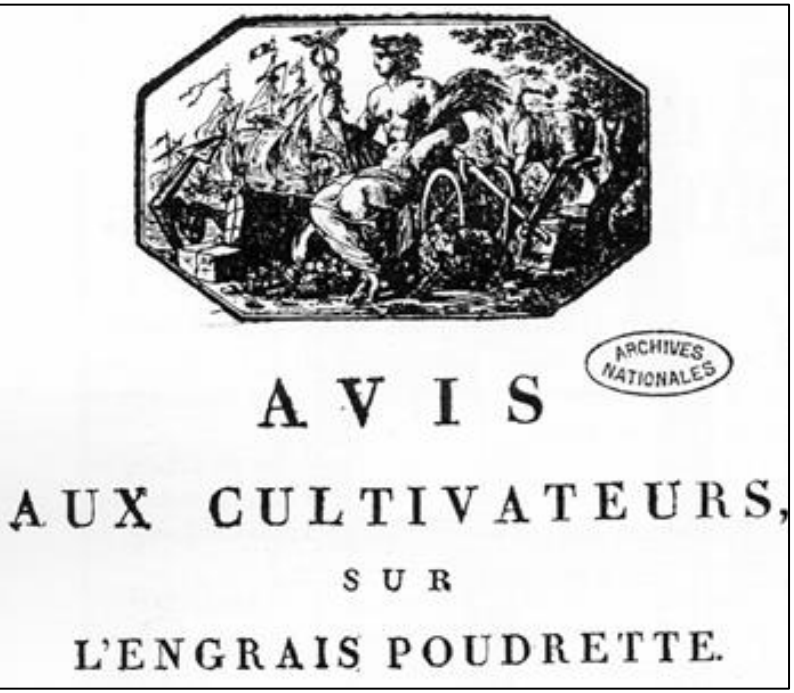


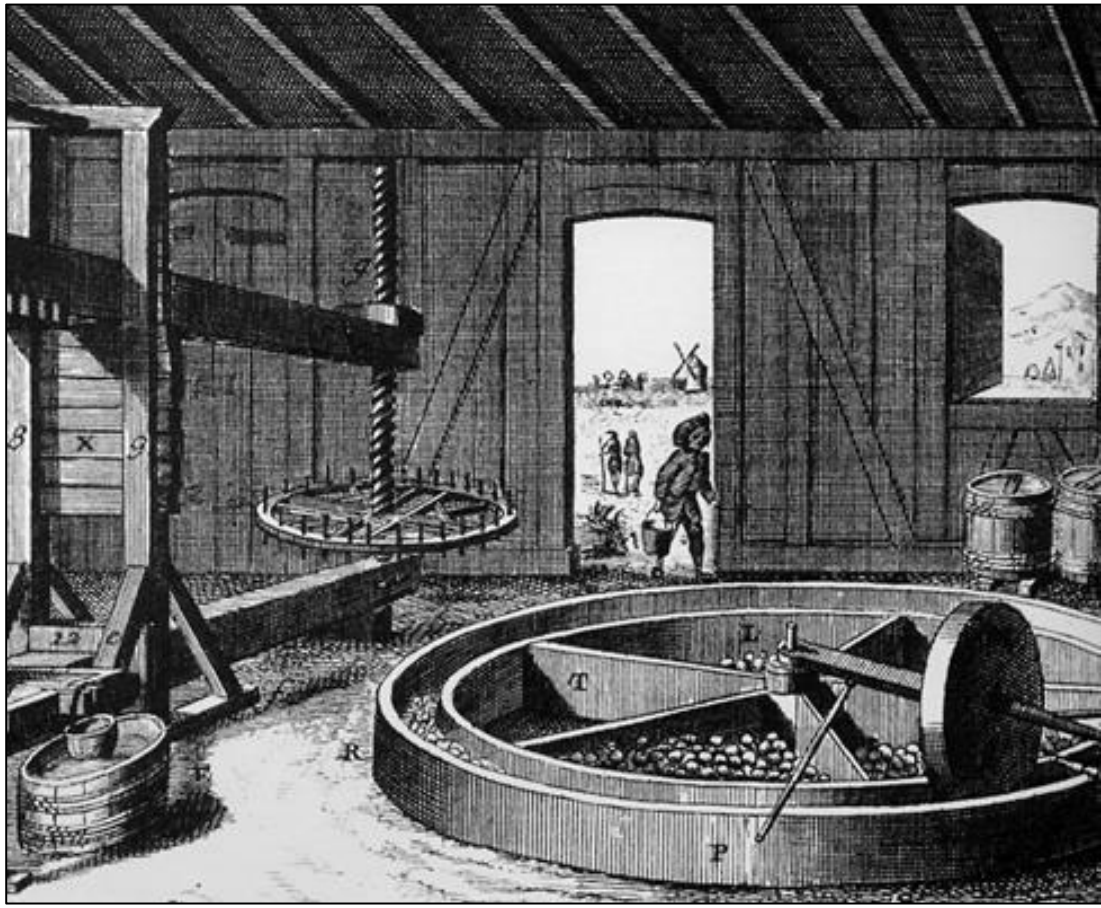
Advanced sanitation (latrines)



Throw everything in the river

Humanure: a solid valuable ressource for fertilizing soils





1796 First pattern for poudrette manufacturing (Bridet)

Fertilizing with human excreta, a old history

1853

L'ENGRAIS HUMAIN.

HISTOIRE DES APPLICATIONS DE CE PRODUIT

A

L'AGRICULTURE, AUX ARTS INDUSTRIELS,

AVEC DESCRIPTION DES PLUS ANCIENS

PROCÉDÉS DE VIDANGES

ET DES

NOUVELLES RÉFORMES, DANS L'INTÉRÊT DE L'HYGIÈNE;

PAR

Maxime PAULET, chimiste,

Membre de plusieurs sociétés savantes, auteur du Traité théorique et pratique des engrais.

Diese Abhandlung bildet zugleich die 20. Lieferung des

Handbuchs der Hygiene

herausgegeben von Dr. THEODOR WEYL in Berlin.

ZWEITER BAND. ERSTE ABTEILUNG.
ZWEITE LIEFERUNG.

Die Schicksale der Fäkalien

in kanalisierten und nichtkanalisierten Städten.

Bearbeitet von

Georg H. Gerson,
Landwirt in Berlin.

Dr. J. H. Vogel,
Vorsteher der Versuchstation der deutschen Landwirtschafts-Gesellschaft in Berlin.

Dr. Th. Weyl,
Privatdozent in Berlin.

Mit 10 Abbildungen im Text.

1896

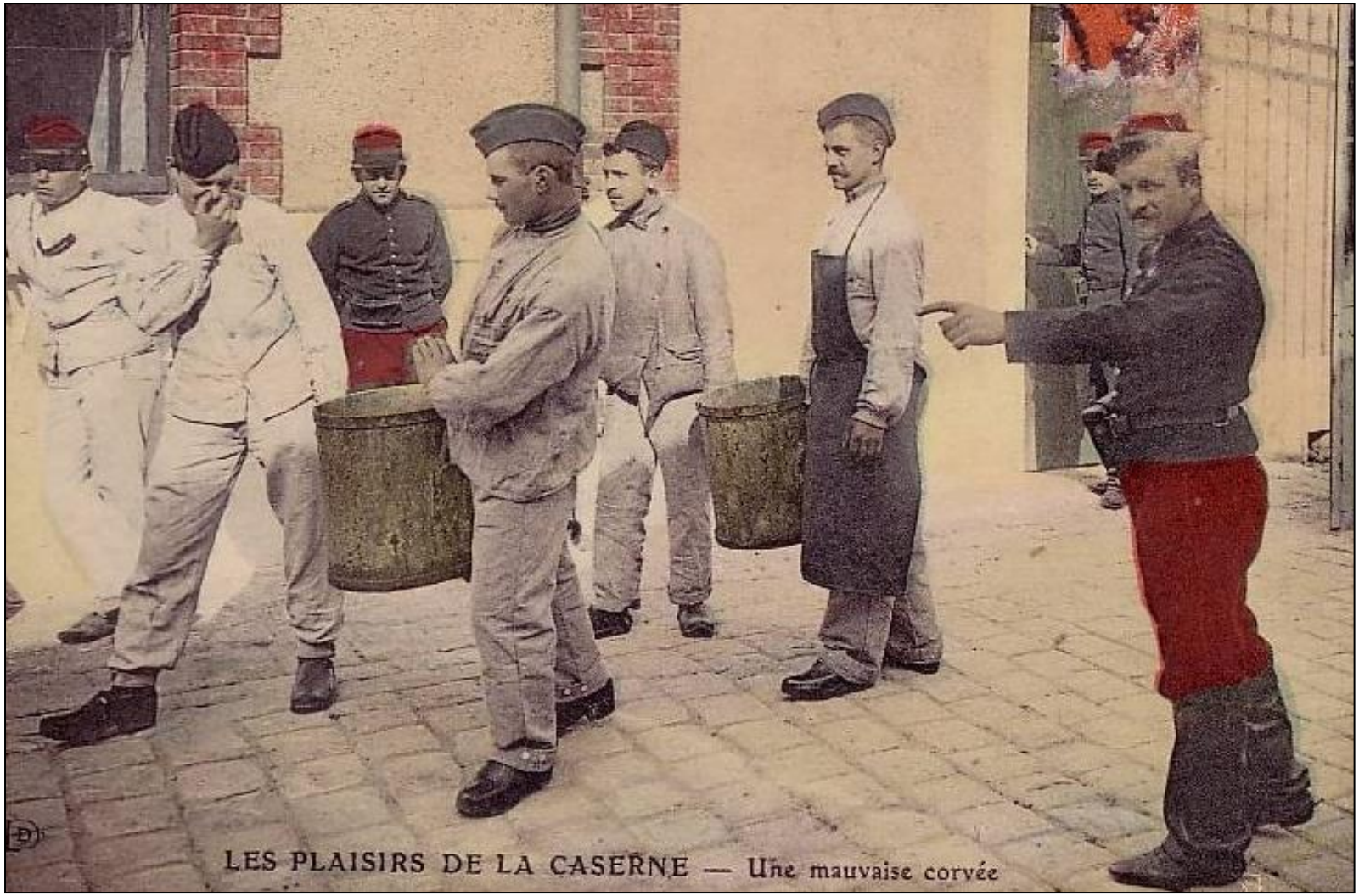
JENA,
VERLAG VON GUSTAV FISCHER.
1896.

Human Excreta Collection manual transportation

1870

Human excreta management, a duty

1890



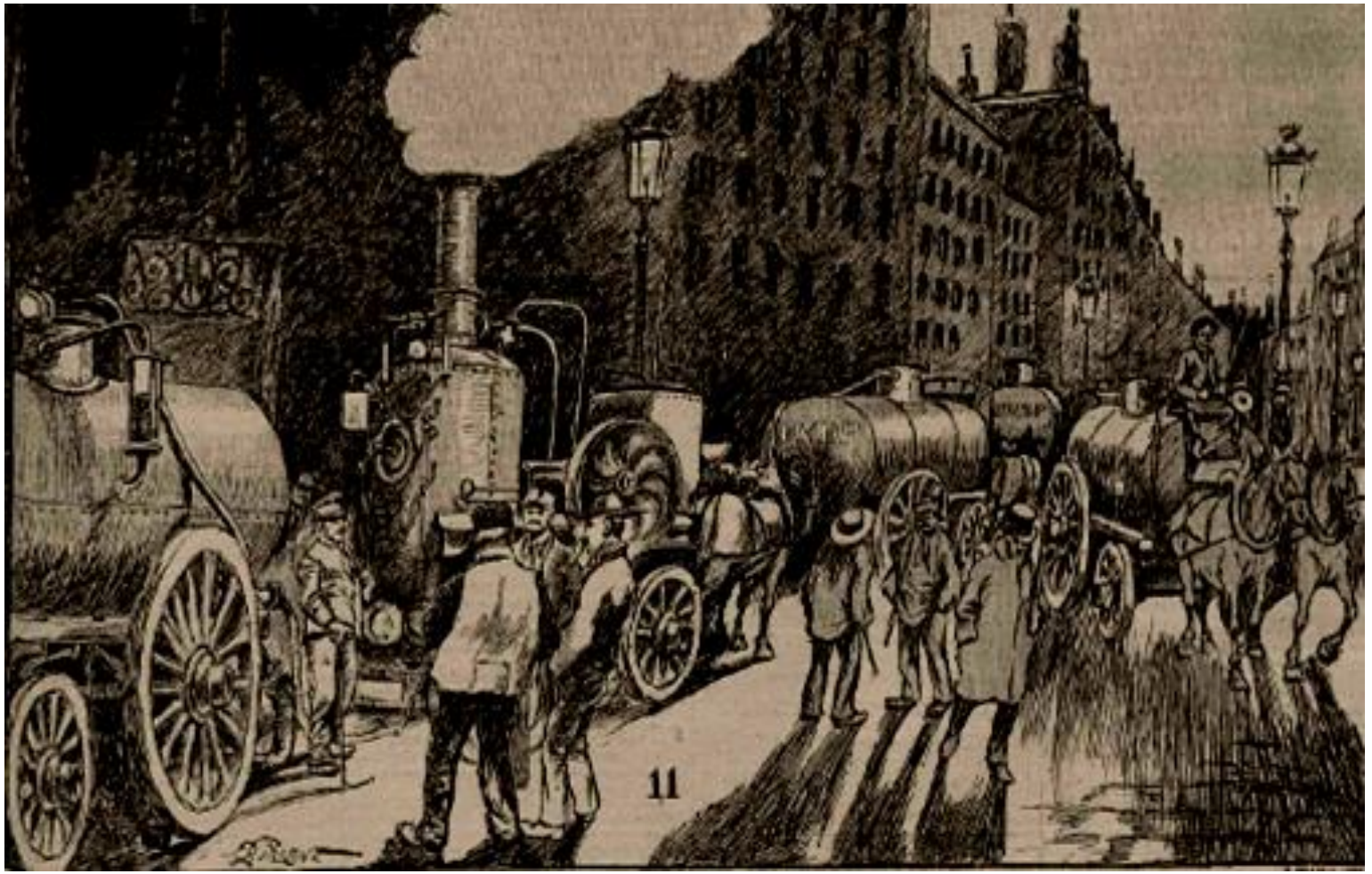
Human Excreta Collection
mobile pneumatique transportation

Human Excreta Collection
mobile pneumatique transportation

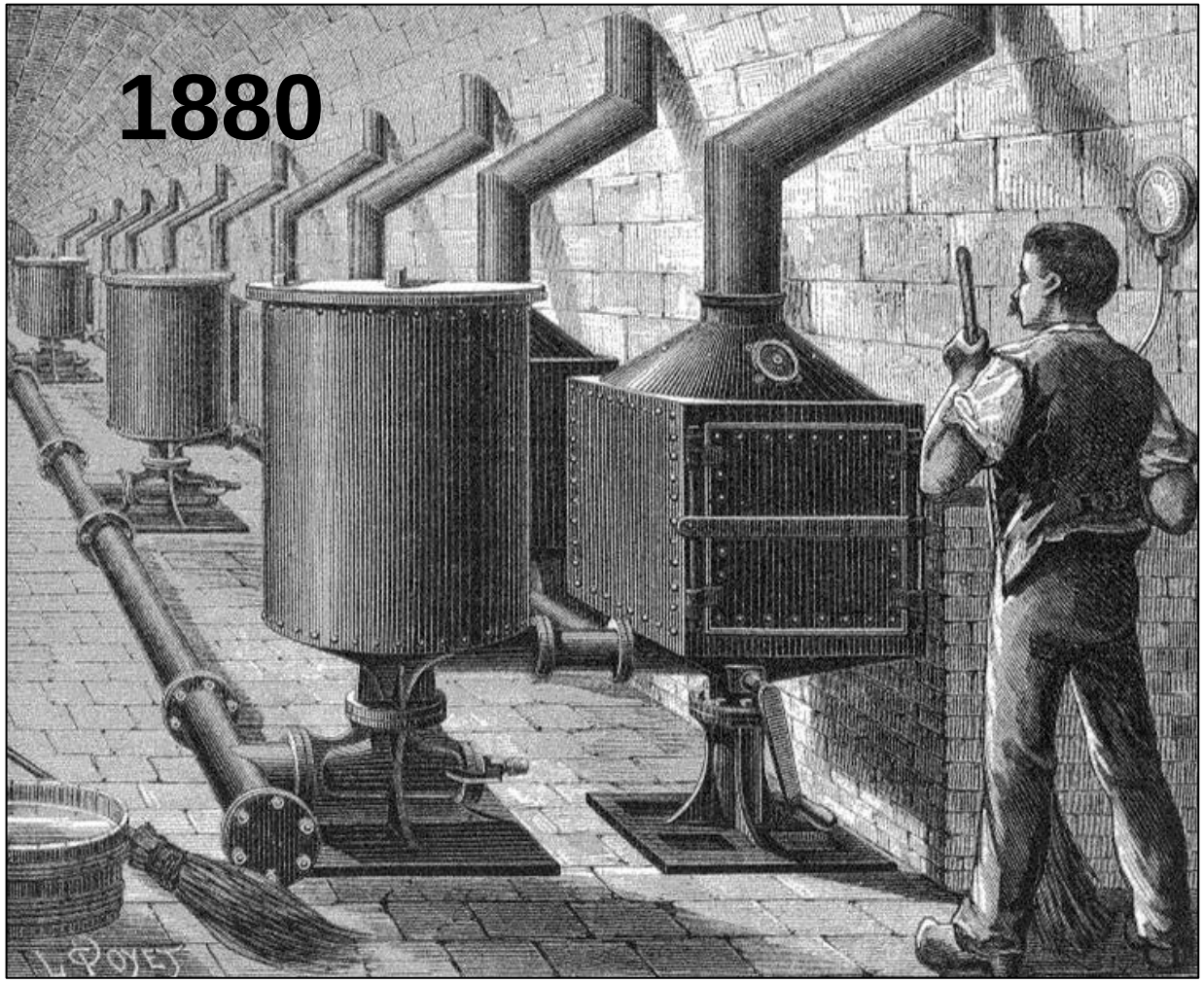
1895

Human Excreta Collection
mobile pneumatique transportation

Human Excreta Collection
mobile pneumatique transportation



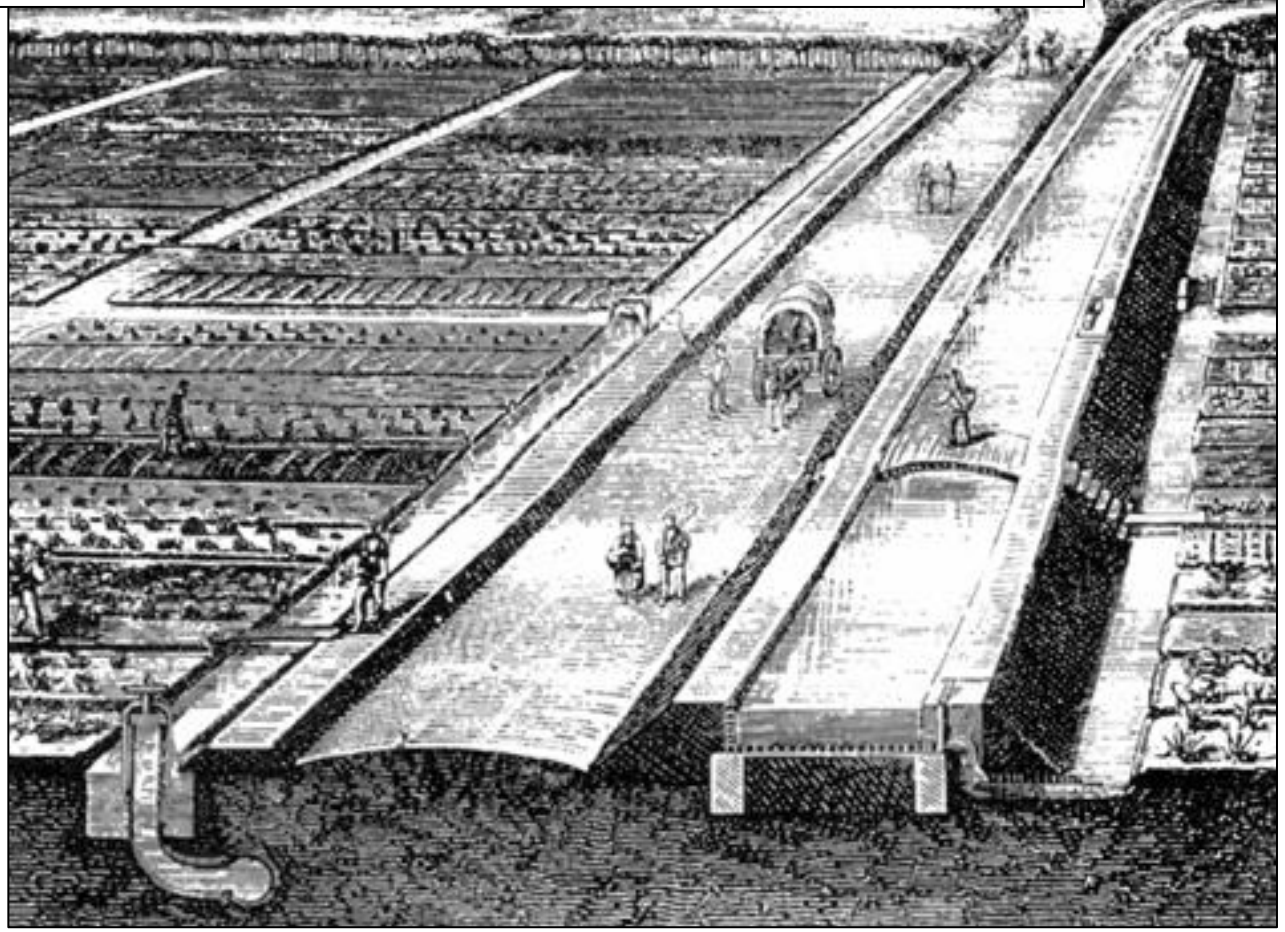
Human Excreta Collection fixed pneumatique transportation




Liernur Amsterdam, 1870

Sewage : a valuable ressource for fertilizing soils

1870 Sewage farm in Genevilliers (Paris)



Sewers : a system to be maintained

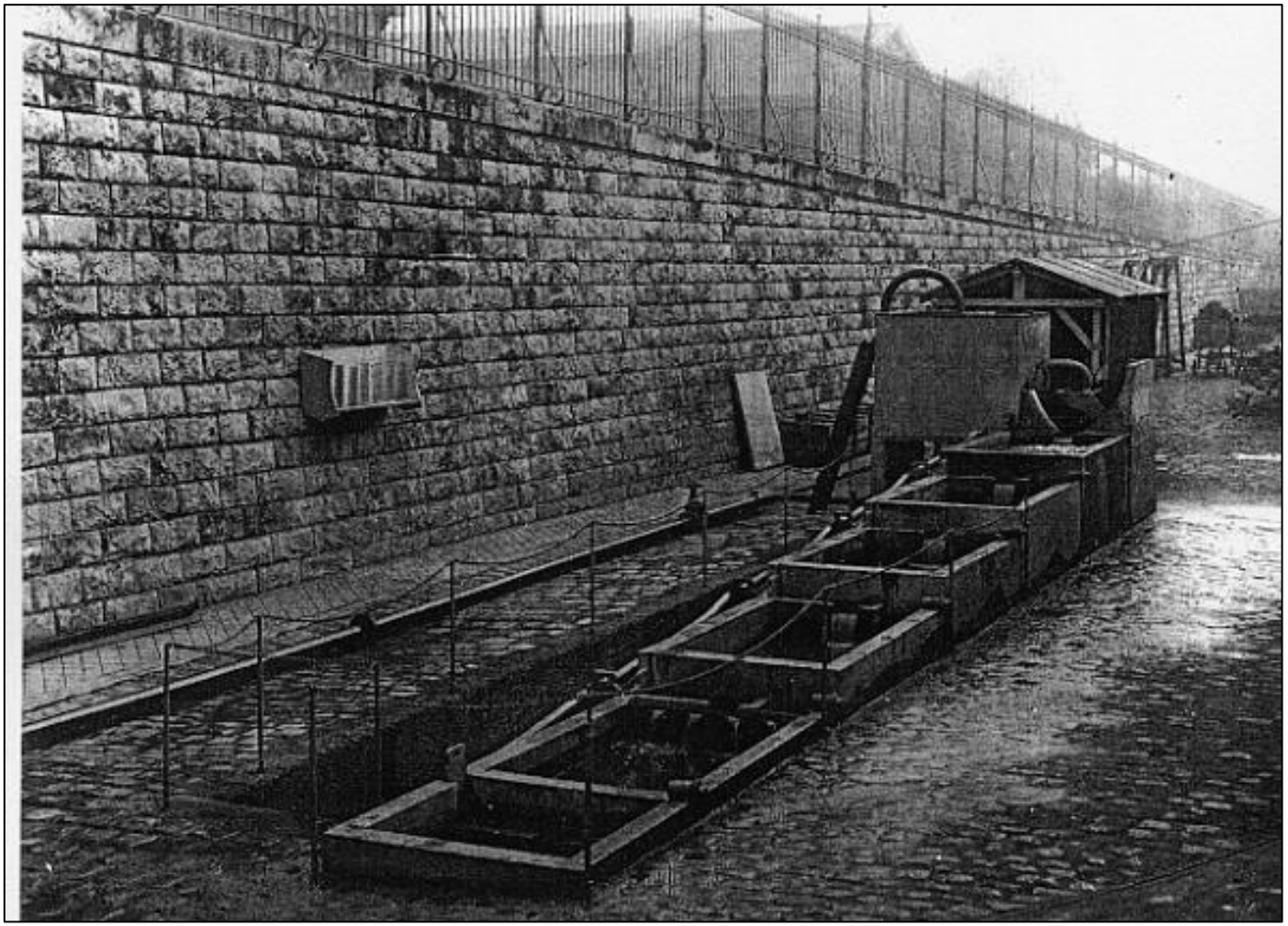
1900 Sewers maintenance (Paris)

First liquid sewage treatment apparatus

1881 automatic scavenger

First experimental activated sludge sewage purification plant

1916 Paris



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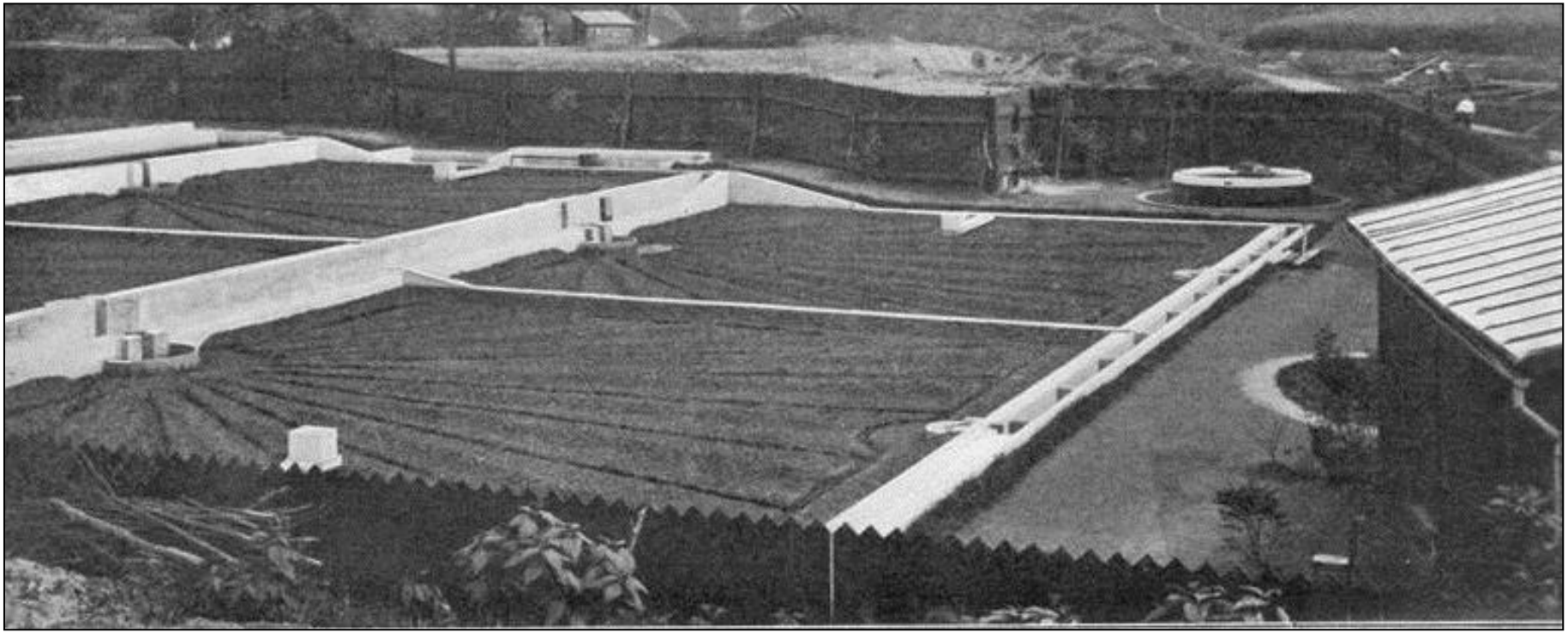
First liquid sewage purification plant

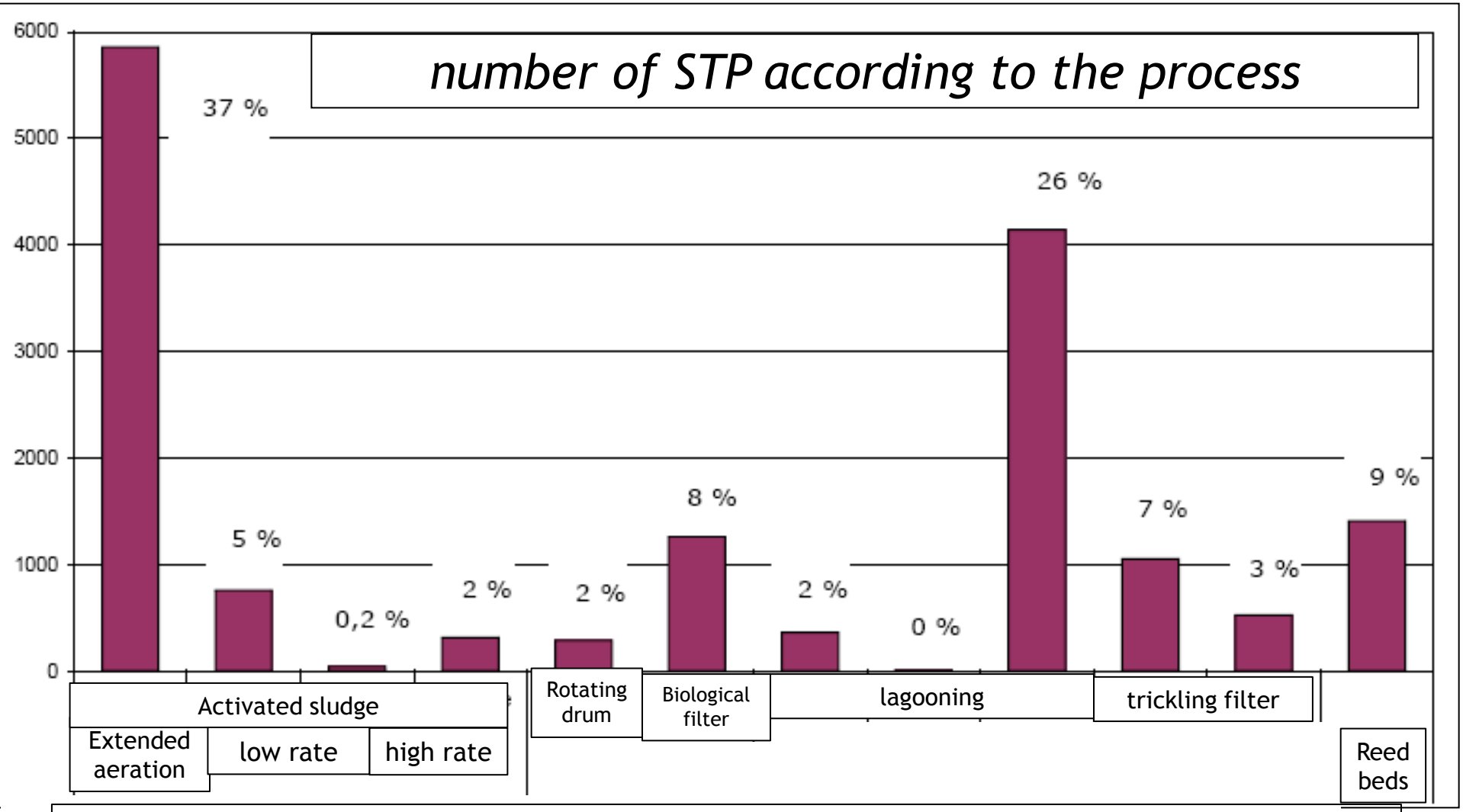


1902 Calmette aerobic filter

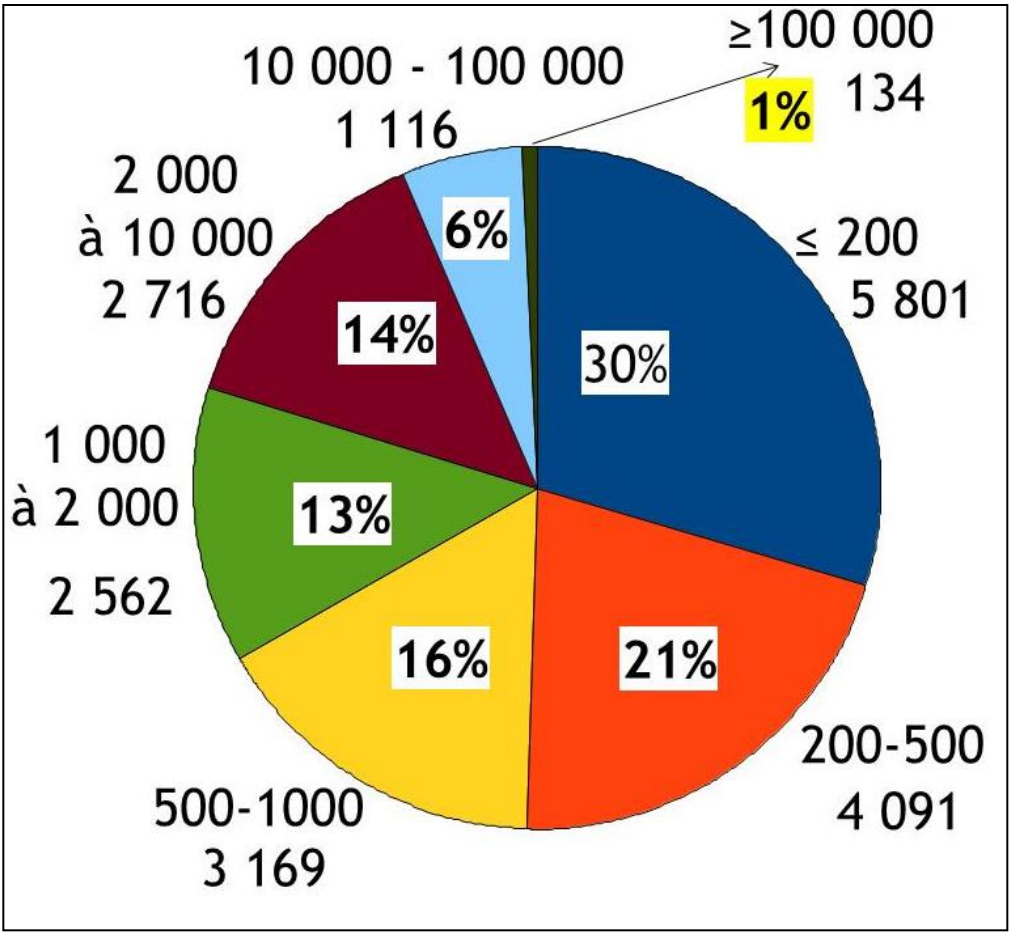
The oldest STP in France : a monument

Trickling Filter 1926 (classé)
(thanks to Jacques Lesavre, AESN)

Typology of sewage treatment plants processes in France (1/2)



Typology of sewage treatment plants in France (1/2)



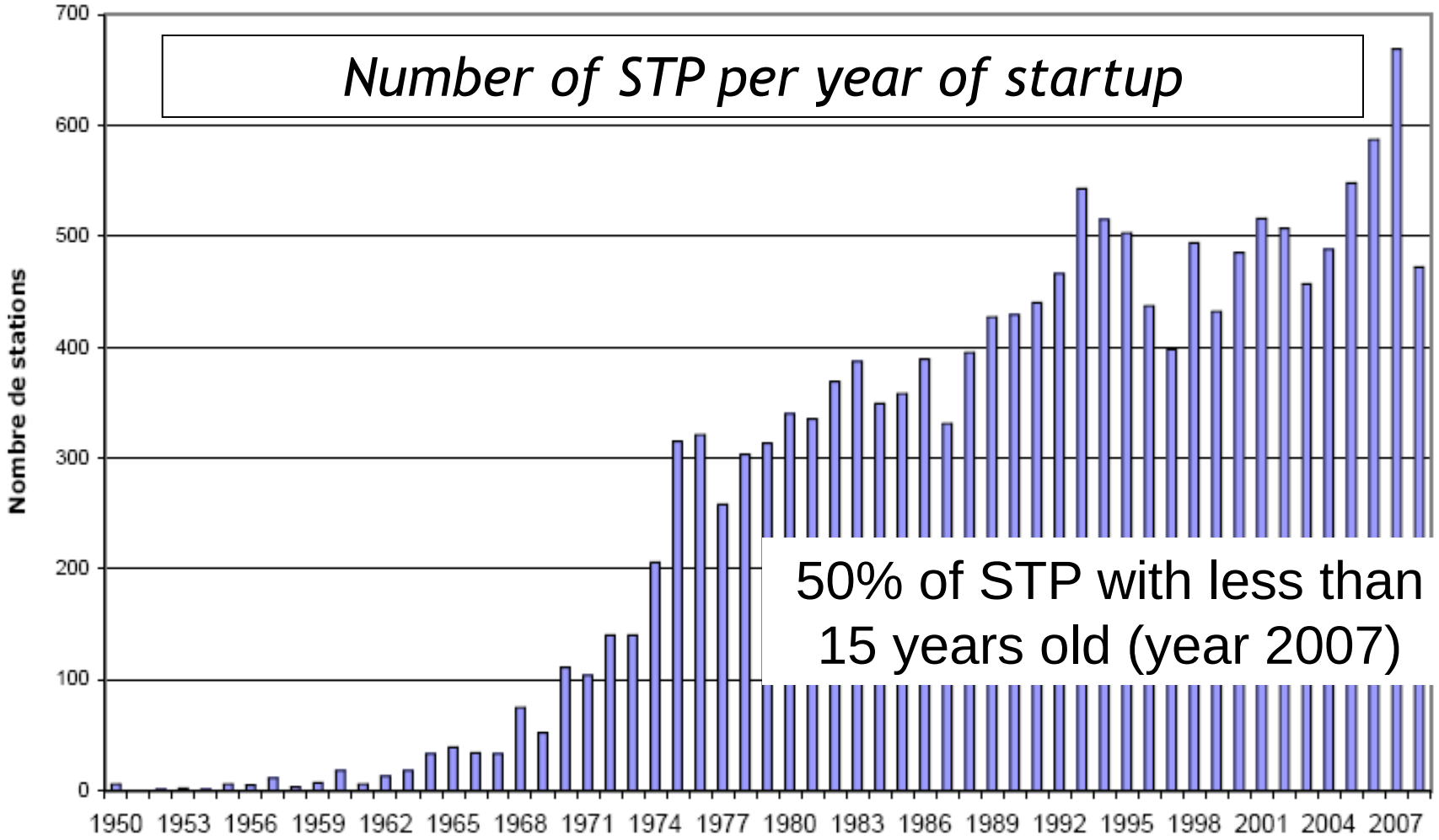
19 600 STP for 75 M.EH

80% STP < 2 000 EH
(but 7% of the pollution load!)

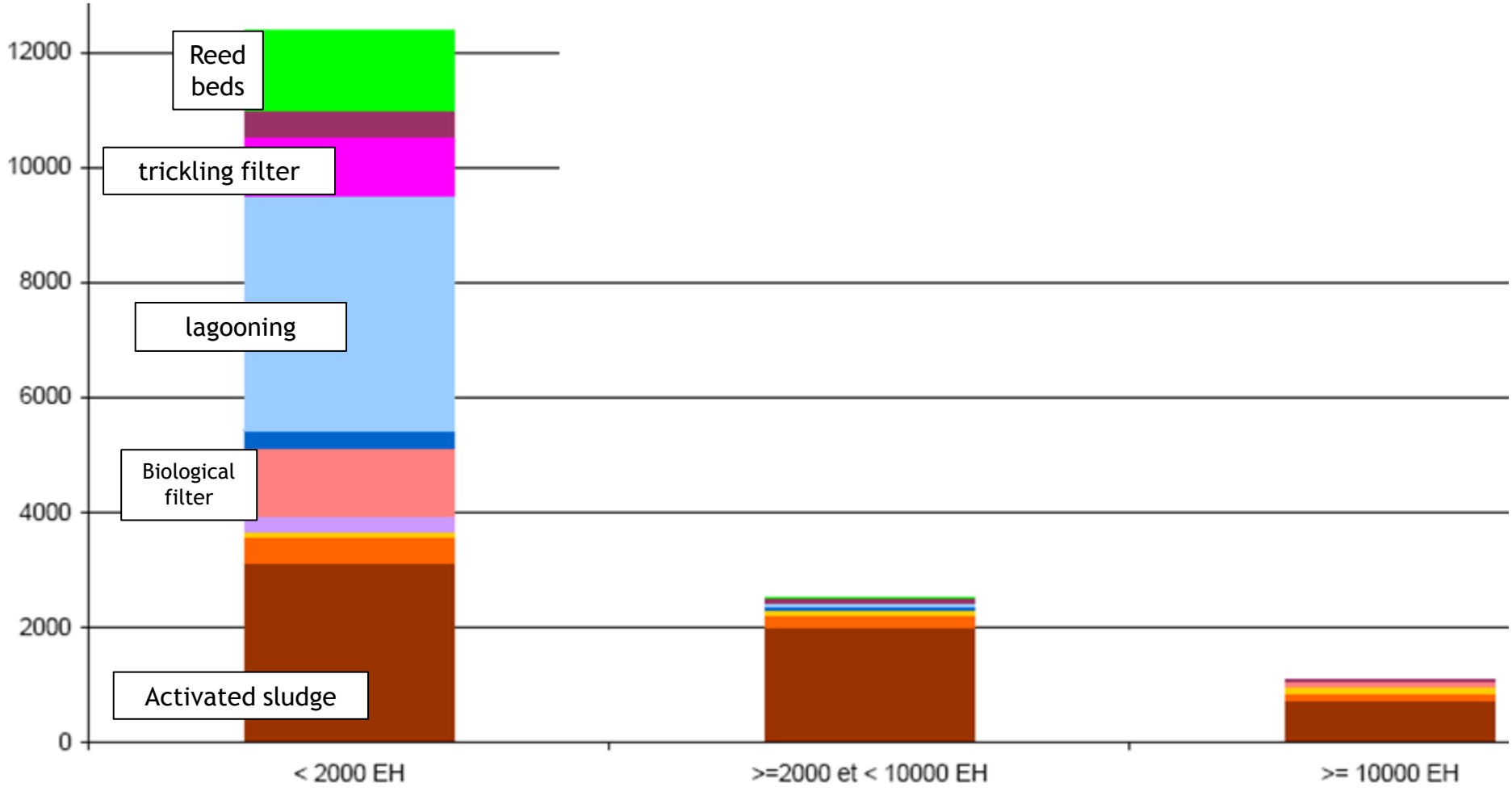
30% STP< 200 EH

1% STP (134 u) > 100 000 EH

Construction rate of STP in France



Distribution of STP processes according to the plant capacity



The fashion effect

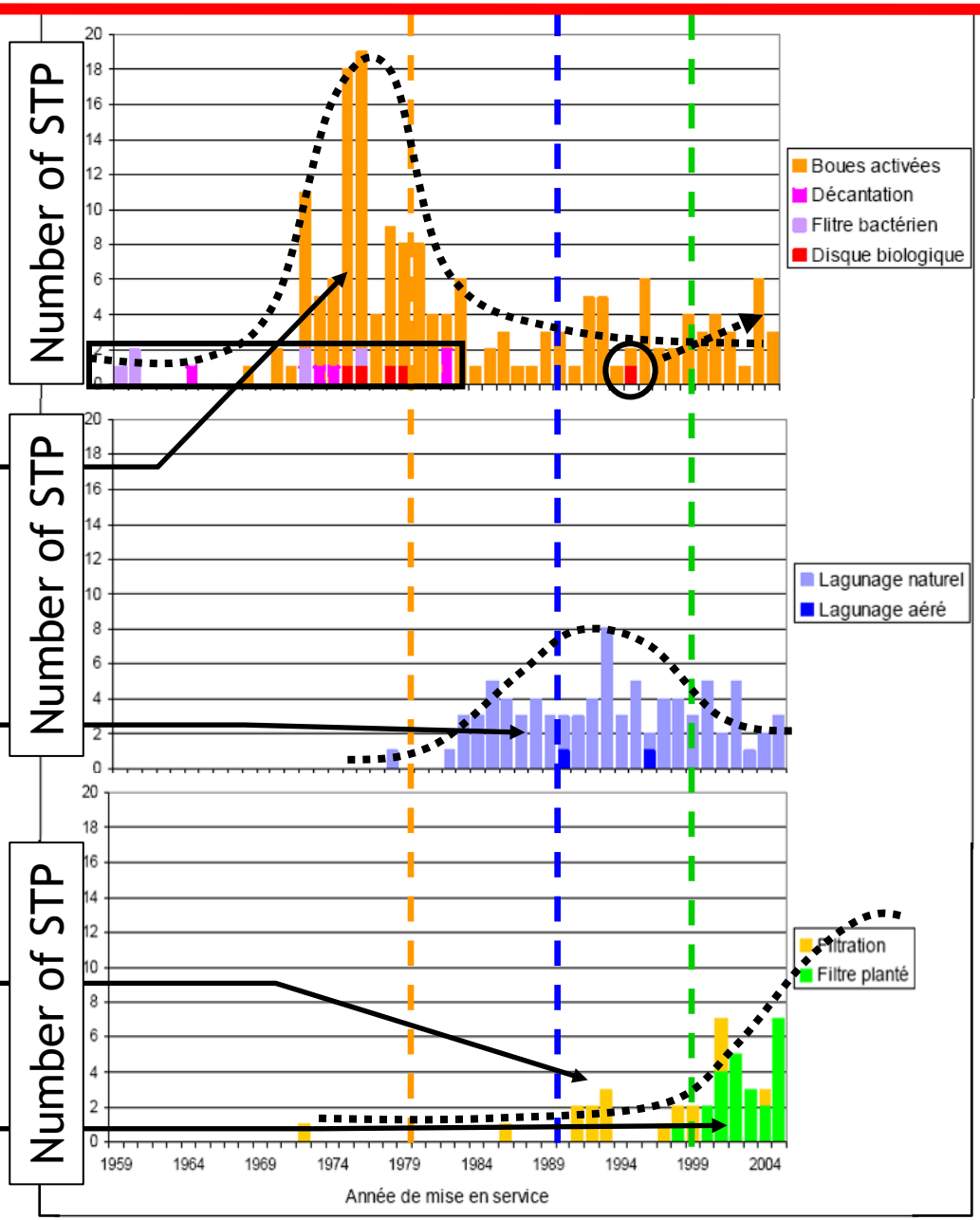
Year of startup of STP in the sector
Seine Normandie
Vallée de Marne

1970-1980: activated sludge

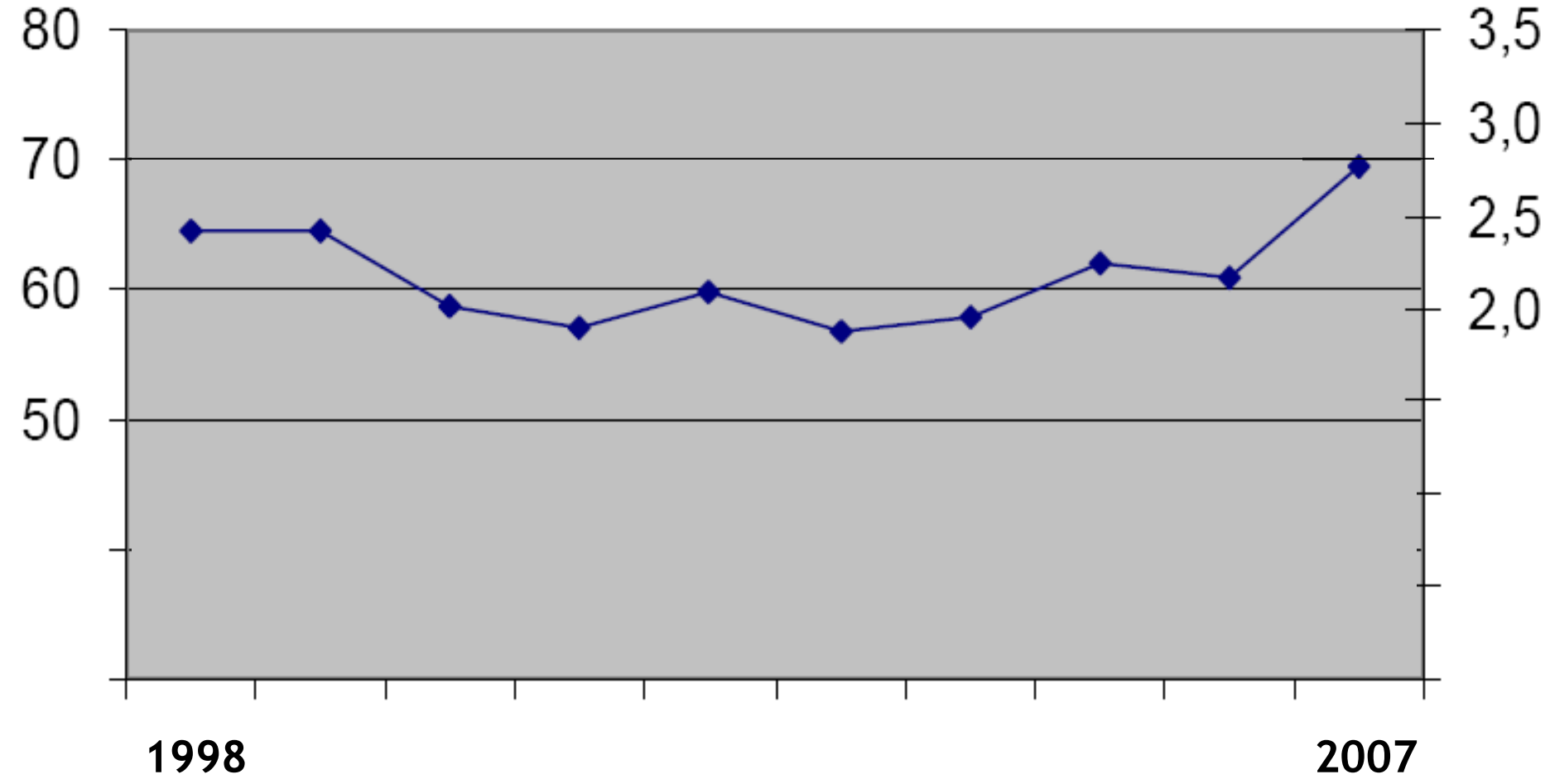
1980-1990: lagooning

1990-2000: sand filters

since 2000: reedbeds



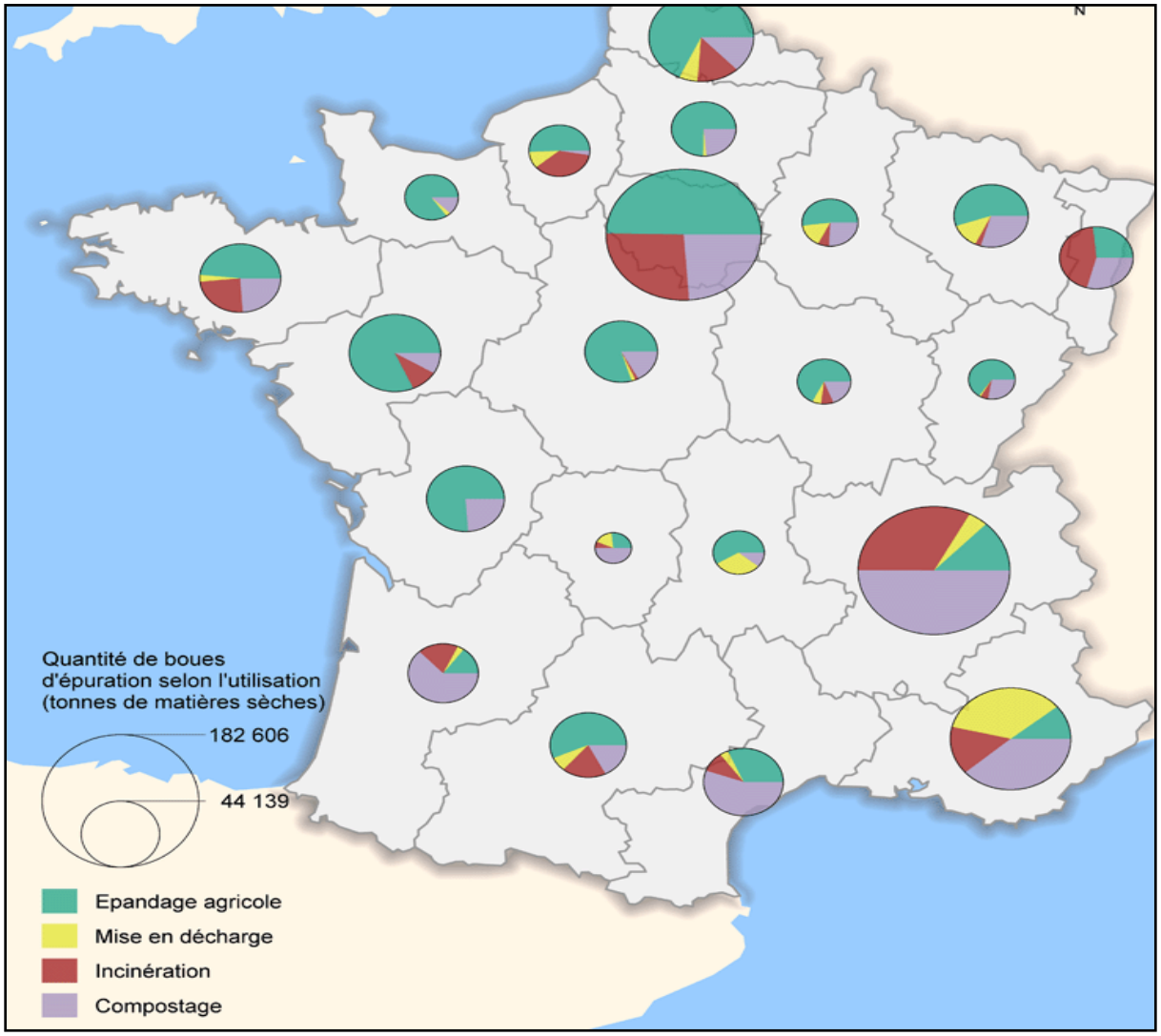
Sewage sludge management in France : constant development of land application



Sewage sludge management in France : constant development of composting

	2003	2005	2007	2010
agriculture	57%	62%	69%	71%
composting	*na*	*na*	*24%*	*28%*
incineration	20%	21%	18%	21%
landfilling	20%	13%	12%	8%

Sewage sludge management in France : geographical distribution of sludge composting



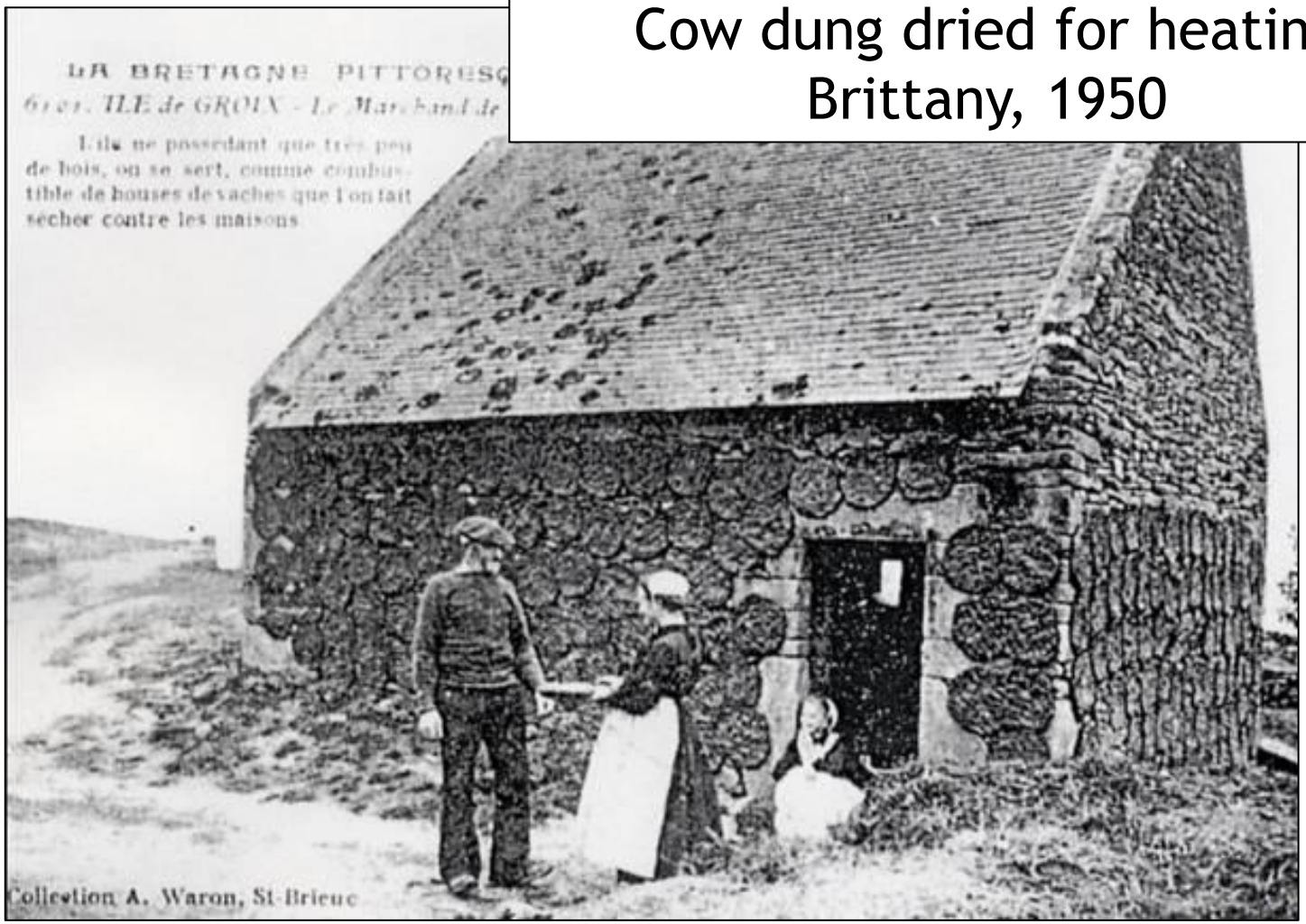
Example of an interesting use of sewage sludge compost

First municipal solid waste recycling plant

MSW transported by train to feed pigs

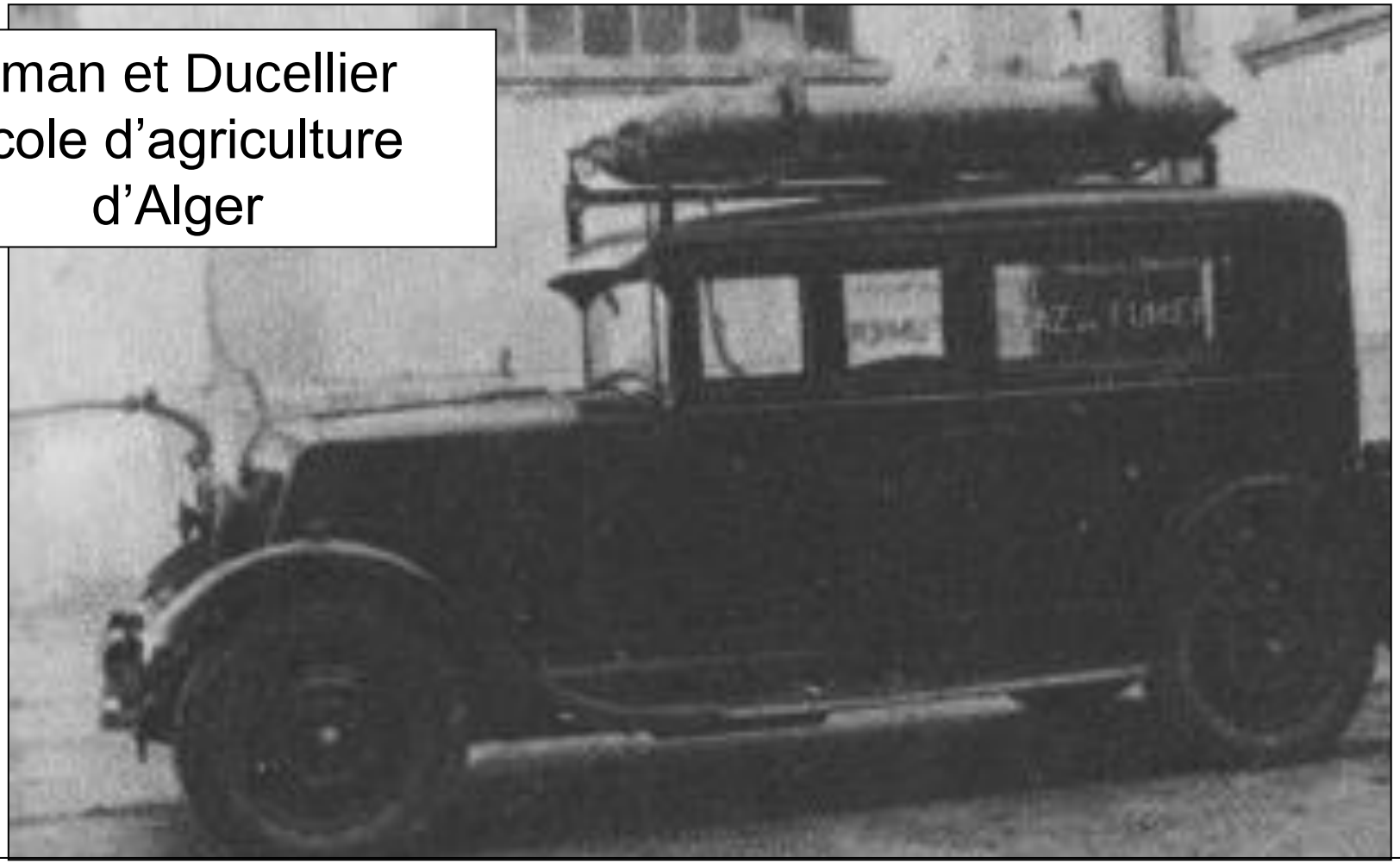
Thermal solid waste recycling plant

Cow dung dried for heating
Brittany, 1950



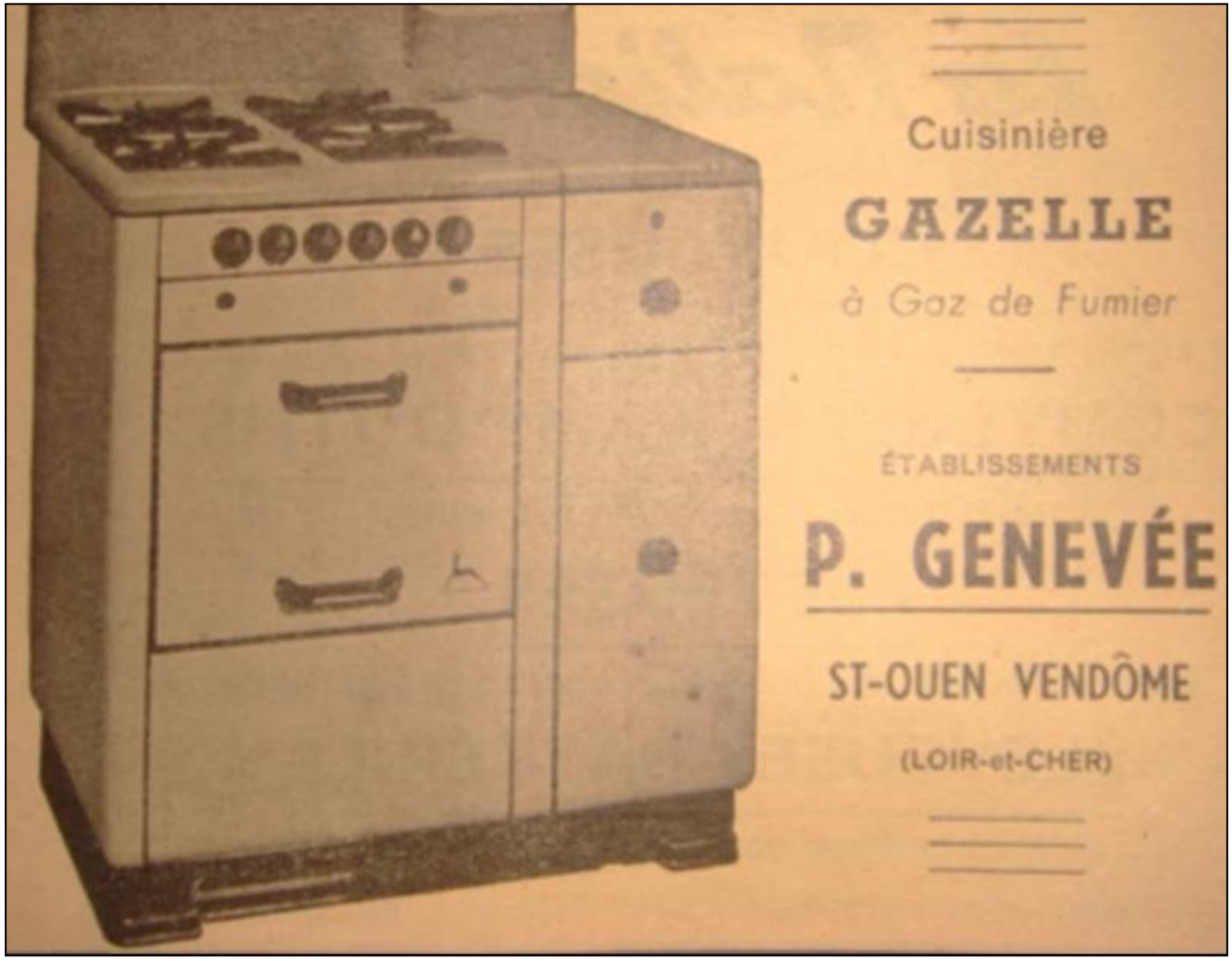
1937 – First car with farmyard gas

Isman et Ducellier
Ecole d'agriculture
d'Alger



First commercial cooking apparatus with biogas

1952



First commercial heating system with biogas

1952

First commercial washing machine with biogas

1952

MACHINE A LAVER

LA VENTOUSE BREVETÉE

ARVOR

La seule machine lavant rapidement sans détérioration tous tissus tels que : **linge fin, lainages, bleus, laine brute, sacs à engrais. Cuve cuivre, Grand foyer, Brûleurs tous gaz, Moteurs tous courants**

Facilités de paiement

ARVOR SAINT-AVERTIN (Indre-et-Loire)

S. A. G. E.

32-34, rue Faidherbe - LILLE

Sté anonyme au Capital de 30.000.000 frs

Socles et brûleurs de lessiveuses 1.500 litres heure.

Socles et brûleurs industriels 3.500 et 5.000 litres heure.

Fers à repasser au gaz

Friteuses et poissonnières

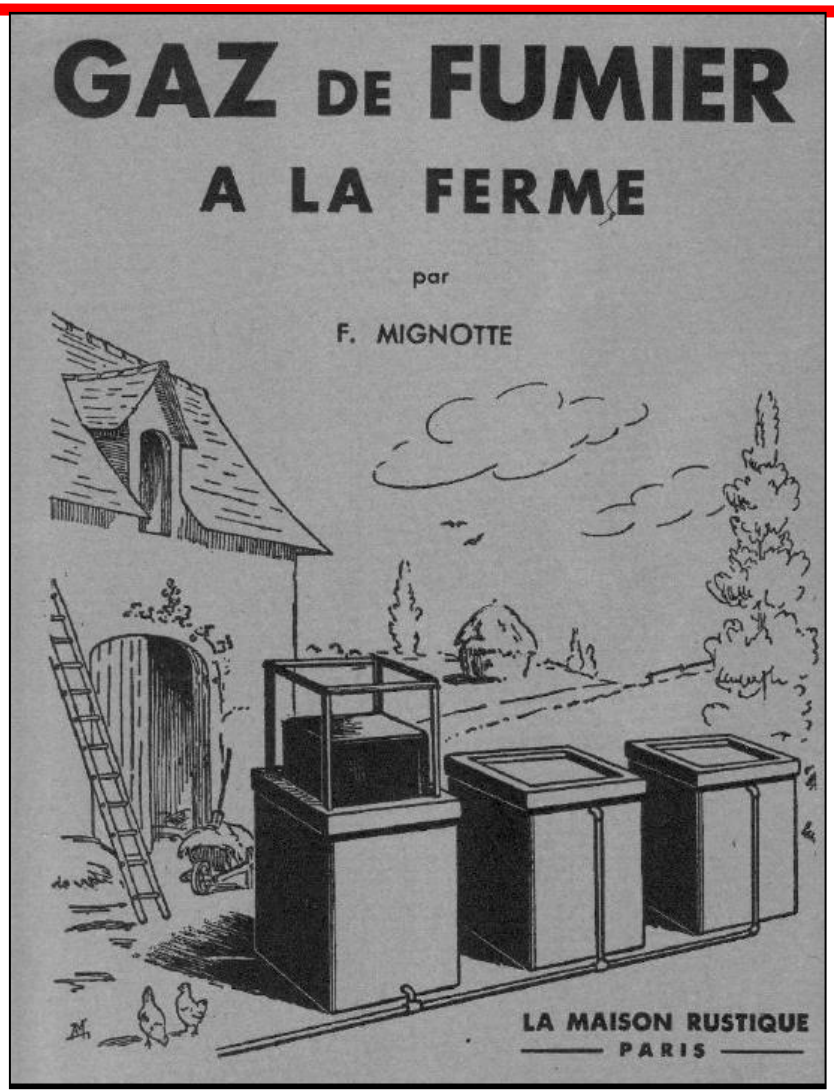
GAZ-VILLE-FUMIER

Butane - propane

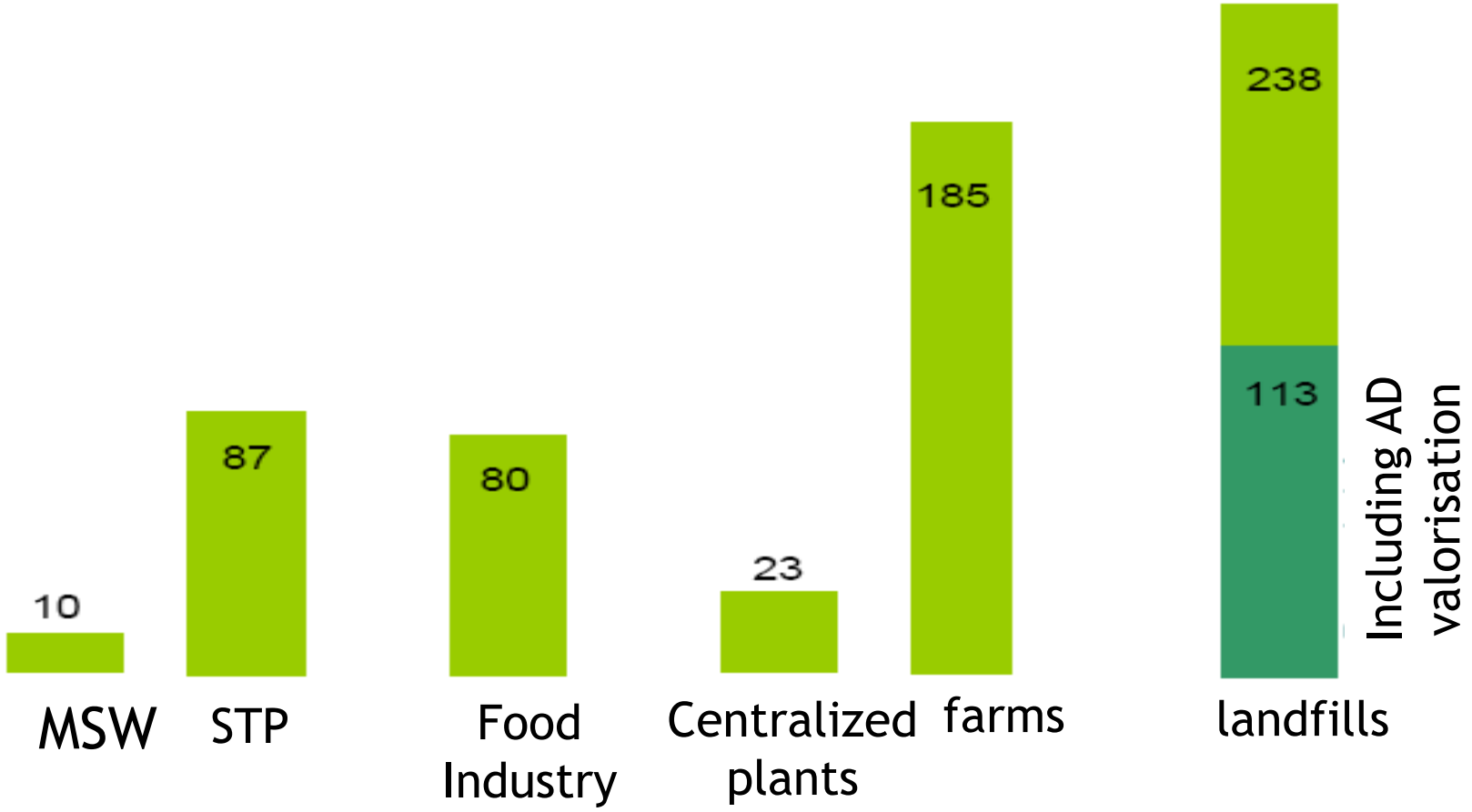
DOCUMENTATION GRATUITE

envoyée sur demande

Biogaz et digestion anaérobie des boues
Exemples d'équipement, France 1952



Current status of AD in France



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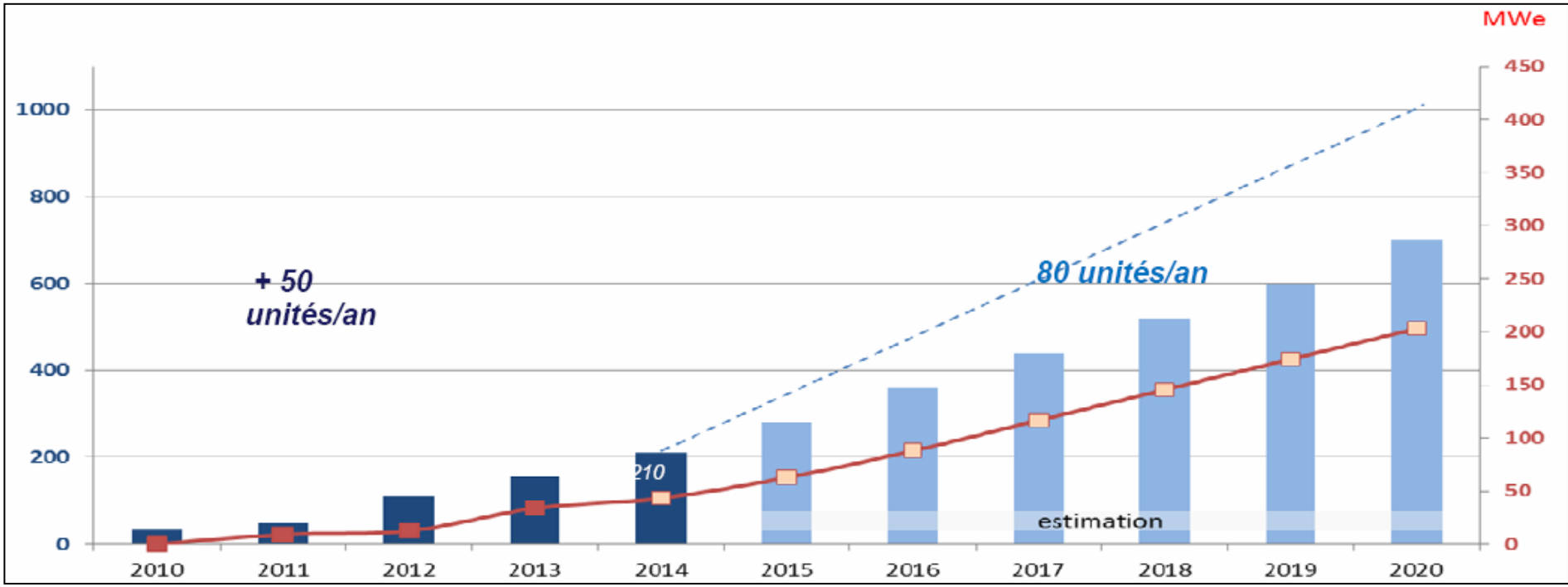

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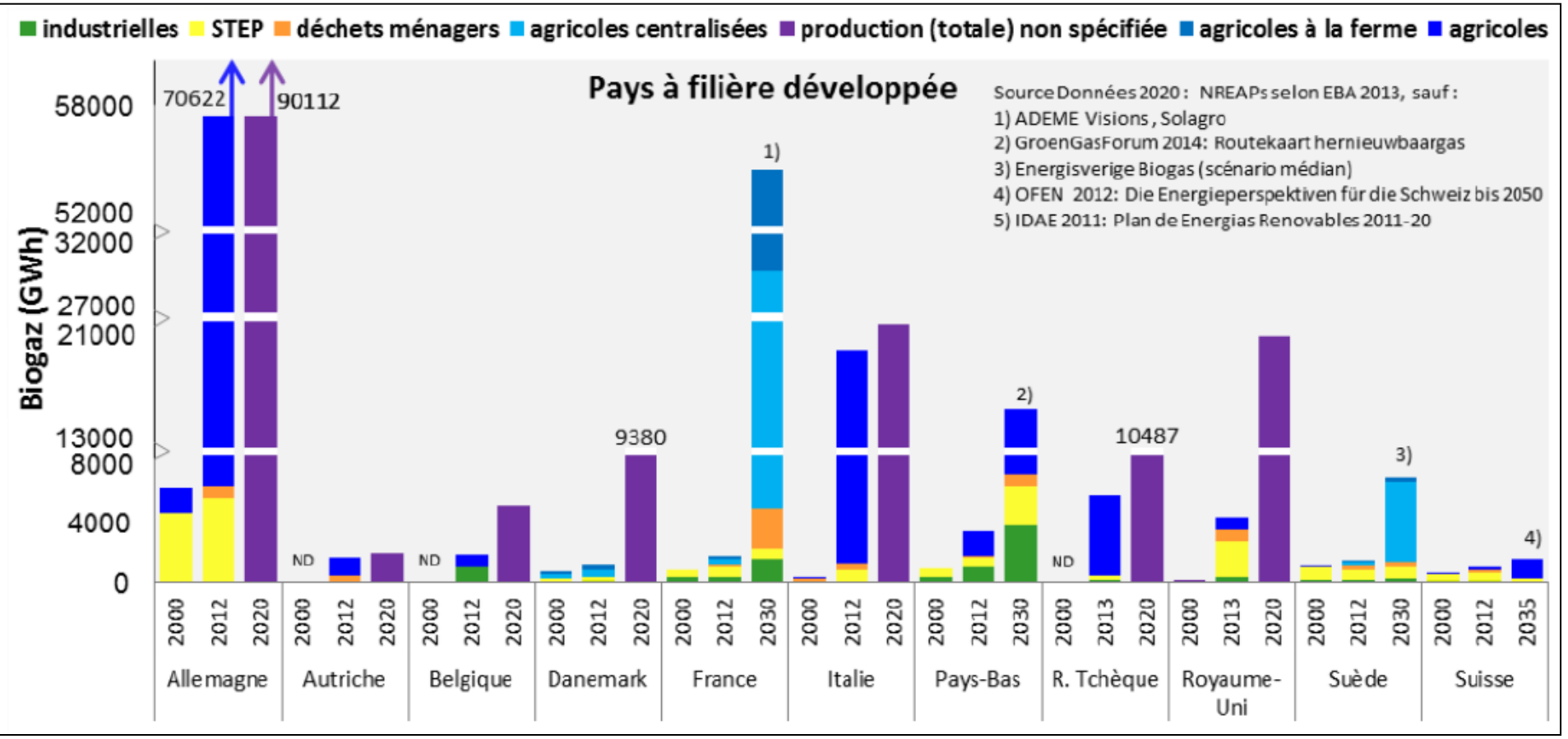
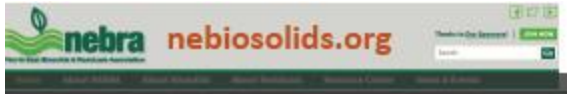


Questions before visiting my office ?



Biosolids use in North America

Biosolids compost use on White House lawn, Washington, DC

before

after