

Introduction

1.1. Research history

For many decades, the themes of body waste, toilets, sewers, and ancient sanitation were not so pleasant research questions for academics of archaeology and ancient architecture. In the earliest publications of significant sites such as Priene, Ephesus, Miletus, Pergamum, Delos, and Pompeii, utilitarian buildings were only superficially addressed by scholars who focused on other architectural typologies for enlightening religious, commercial, or social planning and organization of a people or settlement. Most archaeologists with education in Classics entirely neglected ancient technology, the common belief being that Greeks and Romans had made a scant contribution to growth in this field, if any at all¹. The knowledge of ancient engineering, aqueducts and the use and evolution of water and sewerage systems was minimal, with human waste facilities such as toilets, private or public, only briefly reported and, due to the unsavoury topic, dismissed as something necessary but with no prerequisite of engineering or planning.

What can be called a ‘subconscious blindness’ to evidence appears for the first time in De Iorio, who, in 1820, when interpreting the *forica* seats of the *macellum* of Pozzuoli, describes them as medicinal steam baths, strengthening his theory also with a reconstructive drawing. In his study of the Imperial Palace of the Palatine hill of 1913, Boni describes as an intelligent system of hydraulic water hoisting the *excreta* channels and sitting blocks brought to light at the lower level of the complex².

The 1947 find in the Athenian agora of a mid-7th century BCE child’s potty was entirely ignored by Sir Beazley in his work on Attic pottery finds³. Brumbaugh defined it as a “Greek gadget” in the chapter Mechanical Marvels of his book⁴, and Thompson, when describing it, was unable to determine its use⁵. For most of the 1960s and 70s, vessels for bodily functions emerging from the most important archaeological sites or portrayed on vases of the Classic

period were being overlooked or given fanciful functions⁶. Discoveries that belonged to people for daily living were considered irrelevant by conventional archaeologists for any in-depth investigation⁷. The inadequateness of studies narrowed the knowledge of ancient urban sanitation and hygiene, thus depicting a picture of clean ancient Roman towns not faithful to the reality of life in any ancient village, suburb, town, or city, with people experiencing many noises and smells. The only exception was an article published in 1921 by Danish doctor Mygind on the ancient sanitation of Pompeii, who, without the reluctance of an archaeologist, examined for the first time the *foricae* and drainage system of the settlement and underlined how the sanitation of any people expresses the degree of their civilization⁸.

In 1958 Rosen’s comprehensive synthesis of the history of public health progress, in which he addressed the social background and the evolution of diseases from antiquity to his day, became a milestone in its field⁹. However, his research on ancient sanitation is never mentioned in any archaeological bibliography.

Isolated scientific articles were published in the late 1960s and 1980s. Scobie stressed the need to pay greater attention to the subjects of ancient Roman hygiene in one of them. His conclusive evaluation of the degree of hygiene in ancient Rome was that of it as a dirty, smelly, unsafe city with a somewhat glum life standard and habitat for its citizens¹⁰, a theory also shared by Reimers in his article on those ancient sources which mention these topics¹¹.

¹ This was refuted by Wilson’s research on the mechanisms of water lifting and watermills used in agriculture, which facilitated economic growth in the Hellenistic and Roman times. Andrew Wilson, ‘Machines, Power and the Ancient Economy’, *JRS* 92 (2002), 1–32.

² Giacomo Boni, ‘Some recent discoveries on the Palatine hill’, *JRS*, 2 (1913), 251–252.

³ John Beazley, *Attic Black-Figure Vase-Painters* (London-New York: Oxford University Press, 1956).

⁴ Robert S. Brumbaugh, *Ancient Greek Gadgets and Machines* (New York: State University Press of New York, 1966).

⁵ Reference to Thompson’s conclusions is in Kathleen M. Lynch, John K. Papadopoulos, ‘Sella Cacatoria: A study of the Potty in Archaic Classic Athens’, *Hesperia* 75, 1 (January-March 2006): 1–32. Specifically, 4.

⁶ It was not until 1991 that the dubious topic of bodily functions and their contexts was formally introduced into the academic world with Henderson’s *Maculate Muse*. The first scholarly text of reference in which the dynamics of Greek obscenity are told in Attic comedy, illustrating the views of the ancient Greeks on obscenity and scatology through text and ancient vase depictions. Jeffrey Henderson, *The Maculate Muse: Obscene Language in Attic Comedy* (Oxford: Oxford University Press, 1991).

⁷ For example, in the 1929 publication on the Imperial Baths of Trier, Krenker mentions the *foricae* of the complex without any investigation of their technical workings or analysis of how they fit into the general plan. Daniel Krenker, Emil Krüger, Hans Lehmann, Hans Wachler, *Die Trierer Kaiserthermen I* (Augsburg: Dr. Benno Filser Verlag, G.m.b.H., 1929).

⁸ Holger Mygind, ‘Hygienische Verhältnisse im alten Pompeji’, *Janus* 22 (1921): 251–281.

⁹ George Rosen, *A History of Public Health* (New York: M.D. Publications, Inc., 1958).

¹⁰ Alex Scobie, ‘Slums, Sanitation, and Mortality in the Roman World’, *Klio* 68 (1968): 399–433.

¹¹ Pontus Reimers, ‘Roman sewers and sewerage networks. Neglected areas of study’, in *Munuscula Romana. Papers read at a Conference in Lund (Oct. 1–2, 1988)*, eds. Anne-Marie Leander Touati, Eva Rystedt, Örjan Wikander (Stockholm: Paul & Saströms förlag, 1991), 111–116; Pontus Reimers, “‘Opus omnium dictum maximum’” Literary sources for the knowledge of Roman city drainage’, *Opuscula Romana* XVII:10 (1989): 137–141.

It was not until the work of Neudecker in 1994 that the study on the evolution of public toilets in Imperial Roman cities gained ground¹². The emphasis is on the ostentatious public facilities, the *foricae* of splendour, which owe their luxurious monumentality to the ambition of the elite for the welfare and visual demonstration of public accomplishment. The author analysed some of the most well-excavated ancient cities in the Mediterranean area with an improved sanitation system, explaining how the diffusion of monumental *foricae* was linked to changing political influences, which modified the characters, outlook, and social life of the residents of the upper classes. This change brought new attitudes toward the body and its overall functions. The approach was a step forward in analysing the bodily evacuations topic, using a unique social anthropological methodology but consciously minimising any form of technological observation and dismissing any formal typology analysis as unnecessary.

Jansen began her investigation of water systems, drainage, latrines, and *foricae* in Roman Italy (Hadrian's Villa in Tivoli, Ostia, Minturnae, Pompeii, Herculaneum, and Rome) and Turkey (Ephesus) and established awareness of the relevance of understanding the sanitation history of ancient Roman cities¹³.

Studies about ancient sanitation followed, with approaches to specific characteristics of the subject. The first conference on ancient garbage, called *Sordes Urbis*, was held in 1996, with the first discussions on ancient laws relating to dirt and publicly organised cleaning systems in cities¹⁴. In the congresses on ancient hydraulics and water management, the subject was given specific areas in which relevant questions requiring discussion were finally addressed¹⁵.

Angelakis, in collaboration with various researchers over the past two decades, has published several relevant papers on latrines, *foricae*, and sewage in the ancient Greek world¹⁶. His interest in reusing wastewater and water management has provided interesting data on ancient sanitation, analysing material from the Minoan and Mycenaean periods. A specific approach to ancient Greek sanitation is by Antoniou¹⁷ who, together with Angelakis, has provided

strong evidence on how the concept and technology of flushing toilets took place long before the Roman period¹⁸.

Bouet's research, published in 2009, filled the gaps in the health engineering of the German and French parts of the Empire¹⁹. A comprehensive and valuable inventory of latrines and *foricae* in these regions. Type variations determine plans based on specific instructions, dependent factors, and customer specifications²⁰. His idea that including internal colonnades in plans was to create space and give '*majesté*' is unconvincing. Larger rooms were often built without using columns, and although they could be an element of *luxus*, this was only sometimes the case. For example, in the Macellum of Puteoli (Pozzuoli, Italy) the *foricae* are of a simple rectangular plan but fall in the opulent (*pracht*) category because of their elegant marble wall decor and decorated niches²¹, whilst two peristyle-type *foricae* of Gortyn (Crete-Greece) have none of the monumentality characteristics²².

Hobson's *Latrinae et Foricae* examines various aspects of ancient Roman sanitation related to toilets, waste and their removal, and the social impact it developed²³. His work focuses mainly on the toilets of Pompeii, although there are mentioned those in other parts of the ancient world. The material is sometimes not exhaustive and slightly superficial, as some *foricae* in archaeological sites have no dating or historical background. It is rather a review of excavation projects without interpretative conclusions and sometimes in need of critical assessment.

Another milestone in the field of studies was the publication *Roman Toilets*, where, under the supervision of Jansen, Kolowski-Ostrow, and Moorman, the water infrastructure of toilets, location, architecture, and decoration were discussed, giving brilliant guidelines for original work on different features of sanitation making this an indispensable manual both for experts on the subject and for field archaeologists²⁴.

In 2012, Bradley and Stow published a selection of papers on pollution, dirt, and sanitation in Rome, offering a fascinating insight into what the city had to deal with regarding sanitation through the centuries²⁵.

¹² Richard Neudecker, *Die Pracht der Latrine: zum Wandel der öffentlichen Bedürfnisanstalten in der keiserzeitlichen Stadt* (München, Verlag: Dr. Friedrich Pfeil, 1994).

¹³ Bibliography of Gemma C.M. Jansen is in *Roman Toilets. Their Archaeology and Cultural History*, eds. Gemma C.M. Jansen, Anne Olga Koloski-Ostrow, Eric M. Moorman, *BABesch* Suppl. 19 (Leuven-Paris-Walpole (MA): Peeters, 2011), 199–200. Gemma C.M. Jansen, 'Toilets in Rome: Water supply and Drainage', in *De Aquaeductu Urbis Romae, Sextus Iulius Frontinus and the Water of Rome, Proceedings of the International Frontinus Congress on the History of Water management and Hydraulic Engineering in the Mediterranean Region, Rome November 10–18 (2018)*, ed. Gilbert Wiplinger (Leuven, Paris, Bristol, CT: Peeters, 2020): 211–220.

¹⁴ Organised by the Spanish School of Archaeology and History in Rome. *Sordes Urbis: la Eliminación de residuos en la ciudad romana, Actas de la reunión de Roma (15–16 de noviembre 1996)*, eds. Josep Anton Remolá Vallverdu, Xavier Dupré Raventós, *Bibliotheca Italica* 24 (Roma, L'Erma di Bretschneider, 2000).

¹⁵ The publication series is *Cura Aquarum*.

¹⁶ Bibliography on <https://www.a-angelakis.gr/index.php/publications>.

¹⁷ Bibliography on <https://scholar.google.it>.

¹⁸ Georgios P. Antoniou, Andreas N. Angelakis, 'Latrines and Wastewater Sanitation Technologies in Ancient Greece', in *Sanitation, Latrines and Intestinal Parasites in Past Populations*, ed. Piers D. Mitchell (London and New York: Routledge, 2015): 41–68.

¹⁹ Alain Bouet, 'Les latrines dans les provinces gauloises, germaniques et alpines', *GALLIA*, Suppl. 59, Paris: CNRS éditions, 2009.

²⁰ Chapters 5 and 9.

²¹ Charles Dubois, 'Pouzzoles antique', *BEFAR* 98, Paris, (1907): 301–4.

²² Although not accurately excavated, no evidence of decoration has come to light or is mentioned in the archaeologists' notes.

²³ Barry Hobson, *Latrinae et Foricae, Toilets in the Roman World* (London: Duckworth, 2009), 108.

²⁴ *Roman Toilets. Their Archaeology and Cultural History*, eds. Gemma C.M. Jansen, Anne Olga Koloski-Ostrow, Eric M. Moorman, *BABesch* Suppl. 19 (Leuven-Paris-Walpole (MA): Peeters, 2011). From now abbreviated as *Roman Toilets*, 2011.

²⁵ Mark Bradley, ed., *Rome, Pollution and Propriety, Dirt, Disease and Hygiene in the Eternal City from Antiquity to Modernity*, BSA Studies (New York: Cambridge University Press, 2012).

Prominent scholar on ancient sanitation-related topics Koloski-Ostrow, in her book *The archaeology of Sanitation in Roman Italy*, analyses the evolution of sanitation in Italy in ancient Roman times and challenges common opinions on Roman social customs, beliefs about health, filth tolerance in their cities, and attitudes toward privacy²⁶. The author believes that private and public toilets are not understood as a conscious improvement of sanitation technology by the ancient Romans but just as functional buildings. The author's opinion is that the unpleasant character of these places created the determination to construct them away from sight. This theory applies to the *foricae* of the western part of the Roman world but not in the wealthy eastern provinces, where municipal authorities wanted to express their influence through well-positioned, even independent, decorated public facilities. See, for instance, those *foricae* in Athens, Kos, Hierapolis, or Dion.

In 2015 Camardo and Notomista published their research on the toilets of Herculaneum²⁷. Although a valuable collection of data, the number of *foricae* does not provide a good picture of their location in the urban context, an obstacle associated with the limited excavated area of the archaeological site.

In the same year, Mitchell edited *Sanitation, Latrines, and Intestinal Parasites in Past Populations* with approaches from various disciplines: archaeology, medicine, biology, parasitology (including paleoparasitology and archaeoparasitology), sociology and history²⁸. The papers present a strict definition of sanitation systems, their archaeology, history, and development, some concentrating on biology and parasitology, concluding how ancient hygiene was very distant from modern western requirements.

A collection of papers and case studies on toilets and related artefacts of the North-West Provinces has very recently been published by Hoss, demonstrating the value of scientific analysis of waste in reaching some insight into food habits and diseases through the Roman users of the toilet²⁹.

Jansen, Koloski-Ostrow and Neudecker are currently studying the ancient toilets of Rome. This research will bring together all the ancient facilities in Rome and understand whether they differ, and in what, from those in other parts of the empire³⁰.

The ancient sanitary practice has now undeniably established its niche in archaeological research. Most archaeologists recognise the importance of understanding how people got rid of body waste and developing a functional building

for this purpose. Different scientific approaches enrich our understanding of ancient everyday life, bringing new questions. The answers are gradually coming from archaeometry, bioarchaeology, paleoparasitology, and archaeobotanical studies, all sciences still relatively young and with many areas and periods still to be researched. Studying the contents of dumps, sewers, cesspits, and latrines helps explain the diet and illnesses of people from all over the ancient world, at times confirming what ancient sources wrote about the use of particular herbal remedies in one's diet. Interestingly, Murphy's study of archaeobotanical finds in the latrines and cesspits of an *insula* of Pompeii³¹, or the research on the parasites located in ancient toilets³², prove how despite having public sanitation, the community was not immune from diseases transmitted by faecal contamination³³.

1.2. Overview of ancient hygienic practices

Rosen's first published research on hygiene pointed out how elders were conscious of the need to understand health-related issues, diseases, and epidemics and how to avoid them³⁴. Cleanliness, good water supply and healthy environments are highlighted by ancient sources as relevant in preventing infections and diseases³⁵. Intestinal parasites like whipworms and roundworms were known in ancient times³⁶ and described by ancient doctors³⁷. Mitchell suggests how the taste for *garum*, fermented fish sauce, probably facilitated the diffusion of a particular tapeworm throughout the Roman Empire via commercial ventures³⁸.

Toward the end of the archaic period, values related to social cleanliness, filth and body became a means of defining physical perfection and social belonging. According to Crouch "*The development of water supply, water removal and drainage made dense settlement possible*"³⁹. The awareness of the importance of cleanliness in everyday life and at all social levels becomes an organ of differentiation in the public realm: the need to keep public areas clean becomes a way for the authorities to

³¹ Charlene A. Murphy, *Romans, Rubbish, and Refuse. The archaeobotanical assemblage of Regione VI, insula I, Pompeii*, Archeopress Roman Archaeology 8, Oxford, 2015. DOI: 10.13140/RG.2.1.1958.1607.

³² Marissa L. Ledger et al. 'Intestinal parasites from public and private latrines and the harbor canal in Roman period Ephesus, Turkey (1st c. BCE to the 6th c. CE)', *Journal of Archaeological Science Reports* 21 (2018): 289–97; Martin Jensen Søe et al. 'Ancient DNA from latrines in Northern Europe and the Middle East (500 BC–1700 AD) reveals past parasites and diet', *PLOS ONE*, 13 (4), 2018, e0195481. <https://doi.org/10.1371/journal.pone.0195481>.

³³ Mitchell, 2015.

³⁴ Rosen, 1958.

³⁵ Günther E. Thüry, 'Das Römische Latrinenwesen im Spiegel der literarischen Zeugnisse', in *Roman Toilets*, 2011: 43–47.

³⁶ Evilena Anastasiou et al. 'Infectious disease in the ancient Aegean: Intestinal parasitic worms in the Neolithic to Roman Period inhabitants of Kea, Greece', *Journal of Archaeological Science, Reports*, 17 (2018): 860–864; Piers D. Mitchell, 'Human parasites in the Roman World: health consequences of conquering an Empire', *Parasitology* 144 (1), Published online by Cambridge University, 48–58. DOI: <https://doi.org/10.1017/S0031182015001651>.

³⁷ Mitchell, 2017, 55.

³⁸ Mitchell, 2017, 54.

³⁹ Dora Crouch, *Water Management in Ancient Greek cities* (New York: Oxford University Press, 1993), 19.

²⁶ Koloski-Ostrow, 2015.

²⁷ Domenico Camardo, Mario Notomista, 'Le latrine di Herculaneum. Studio dei sistemi igienici di una città romana', "*Vesuviana*", 7 (Pisa, Roma: Fabrizio Serra Editore, 2015): 55–190.

²⁸ Piers D. Mitchell, ed., *Sanitation, Latrines and Intestinal Parasites in Past Populations* (London and New York: Routledge, 2015).

²⁹ Stefanie Hoss, ed., *Latrinae: Roman Toilets in the Northwestern Provinces of the Roman Empire*, Archeopress Roman Archaeology 31, 2018. Epublication ISBN 9781784917265.

³⁰ Jansen, 2020, 211.

take control of their image and status⁴⁰. Although there was no scientific recognition of the transmission of disease through poor sanitation, there was an awareness of the need for cleanliness rules in the city. In the 5th century BCE, public administration was intensely concerned with maintaining order and enforcing the law. An inscription found in the port of Thasos, dating to this time, contains provisions on construction regulations, responsibilities for street cleaning and the many penalties for non-compliance. Maintenance of private property and an adequate standard of cleanliness of the street fell upon the individual owners, and it was prohibited to accumulate or throw dung in the middle of the town's main streets, the penalty being a hefty fine to pay to the council⁴¹. The responsibility of the *epistatai*, the authority for specific public works, was to take care once a month of the significant street cleaning work and care for the toilets and their sewage, ensuring that their covers were waterproof⁴².

In Athens, amongst the functions of the *astynomoi*, the civic magistrates who looked after the public and private properties of the city was ensuring *koprologoi* (refuse collectors) cleaned the fouled districts, not leaving ordure within ten *stades* of the city. Families also called these 'cleaners' to collect and dispose of rubbish and clean the cesspits in homes, inferring that human waste was an issue and a complication to be taken care of⁴³. Inscription IG II² 380 from Piraeus dating back to 320 BCE has been reconstructed as a behavioural code prohibiting people from defecating in the agora and along the city streets. Using the streets must have been something happening with some regularity if even Aristotle notices how Athens and Piraeus streets are kept clean from corpses and all kinds of excrement⁴⁴, and Gross references to the building of public toilets to keep the cities clean⁴⁵. The so-called *Astynomen* Pergamene, probably a 2nd century CE re-edition of a 2nd century BCE law, supervised all that concerned the public roads and established the locations for statutory waste dumps⁴⁶. Zuchtriegel argues that if, in the original document, the Attalid king requires one to keep public toilets clean, it certifies their presence already in the Hellenistic age of the city⁴⁷.

In Rome, at the time of Augustus, the population was roughly one million⁴⁸. The city's central drain, the Cloaca Maxima, had been draining water since the 7th century BCE⁴⁹. Originally an open-air canal, it carried off the collected waters of the Velabrum, a low valley connecting the Forum with the Forum Boarium and the Capitoline Hill with the western slope of the Palatine Hill. There were many branches of the central sewer, but all appeared to be 'official' drains servicing *foricae*, baths, and other public buildings. Private residences in Rome relied on sewage treatment pits or emptied their vessels in gutters provided for this purpose. The system worked because of the continuous flow of wastewater coming from fountains and baths. In the *Lex Iulia Municipalis* of the 1st century BCE, the *plostra stercoris*, carts driven by the *stercorarii* (dung collectors), could come into town to collect human and animal excrement even during the daytime when all other transport on wheels was not allowed⁵⁰. The estimated daily production of human waste was about 50,000 kg, so it was necessary to enable carts to circulate for removal regularly⁵¹. Some citizens disposed of their dung directly in the Tiber, making it an open sewer⁵². Many ancient sources refer to human waste sold by the *stercorarii* to the farmers who used it as fertilizer for their crops⁵³, causing the proliferation of pathogens reintroduced into the human environment by the soil's produce. Although the authorities took care to remove the filth from people's streets and homes, it was nonetheless a health hazard. Human garbage on the banks of the Tiber could contaminate the water. Galen, Pergamene physician of Marcus Aurelius, Commodus and Septimius Severus, acknowledges how fish were of better quality upstream rather than downstream of the Cloaca Maxima⁵⁴.

The rules and statutes did not prevent citizens from disregarding the law; when necessary, even adequate health precautions for the community's general well-being were recognized. Graffiti like the one in Pompeii enunciating "*Cacator sic valeas/ut tu hoc locum transeas*" ("*Shit with comfort and good cheer, so long*

⁴⁰ Astrid Lindenlauf, 'Dirt, cleanliness and social structure in Ancient Greece', in *Agency uncovered. Archaeological perspectives on social agency, power and being human*, ed. Andrew Gardner (London: UCL Press, 2004): 81–105.

⁴¹ See Ilias Arnaoutoglou, *Ancient Greek Laws. A Sourcebook* (London-New York: Routledge, 1998), 76; for the definition of *epistatai* see Robert Develin, *Athenian Officials, 684–321 B.C.* (Cambridge: Cambridge University Press, 1989), 13.

⁴² SEG xliii 785.

⁴³ Edwin J. Owens, 'The *Koprologoi* at Athens in the fifth and fourth centuries BC', *CQ* 33, 1 (1983): 44–50.

⁴⁴ Aristotle, *Athenian Constitution*, 50, in *Aristotle in 23 Volumes, Vol. 20*, trans. H. Rackham (Cambridge: Harvard University Press, London: William Heinemann Ltd. 1952), Perseus Digital Library. <http://data.perseus.org/texts/urn:cts:greekLit:tlg0086.tlg003.perseus-eng1>. (Accessed 17 September 2016).

⁴⁵ Walter Hatto Gross, 'Bedürfnisanstalten', in *Der Kleine Pauly 1*, eds. Konrat Ziegler, Walther Sontheimer, coll. 851-2 (Stuttgart, A. Drukenmüller, 1964).

⁴⁶ See Chapter 2.

⁴⁷ Gabriel Zuchtriegel, 'Öffentliche Latrinen in der Astynomeninschrift von Pergamon', *Zeitschrift für Papyrologie und Epigraphik*, Bd. 167 (2008): 85–87.

⁴⁸ Neville Morley, 'Population size and Social Structure', in *The Cambridge Companion to Ancient Rome*, ed. Paul Erdkamp (Cambridge: Cambridge University Press 2013): 29–44.

⁴⁹ For the Cloaca Maxima and literature, Elisabetta Bianchi, *La Cloaca Maxima e i sistemi fognari di Roma dall'antichità ad oggi* (Roma: Palombi editori, 2014).

⁵⁰ Cornelis Van Tilburg *Traffic and Congestion in the Roman Empire* (London & New York: Routledge, 2007), 128–130; Silvio Panciera, 'Nettezza Urbana a Roma: organizzazione e responsabili', in *Sordes Urbis: la Eliminacion de residuos en la ciudad romana, Actas de la reunion de Roma (15–16 de noviembre 1996)*, eds. Josep Anton Remolà Vallverdú, Xavier Dupré Raventós, Bibliotheca Italica 24 (Roma: L'Erma di Bretschneider, 2000): 95–105.

⁵¹ Ann Olga Koloski-Ostrow, *The Archaeology of Sanitation in Roman Italy. Toilets, Sewers, and Water System* (Chapel Hill, NC: University of North Carolina Press, 2015), 67.

⁵² J. Donald Hughes, *Environmental problems of the Greeks and the Romans: ecology in the ancient Mediterranean* (Baltimore, John Hopkins University Press, 2nd edition 2014), 177.

⁵³ Columella, *Arb.* 21, 2; 23, 1; *Rust.* 1.6.24, 10.84 f; Varro, *Rust.* 1.13.4, suggests to farmers to build latrines for the slaves over the manure piles.

⁵⁴ Galen, VI, 722–3k.

as you do not do it here”)⁵⁵ or Trimalchio stating in the Satyricon: “*Praeponam enim unum ex libertis sepulcro meis custodiae causa, ne in monumentum meum cacatum curra*” (“I am appointing one of the freedmen to take care of the tomb and prevent the common people from running up and defiling it”)⁵⁶, or if some building owners planted nettles in these popular spots where disobedient citizens would evacuate⁵⁷, are all clear indicators of how frequently, when nature called, some individuals would not waste time seeking a *forica*. Petronius warns people to be careful walking the streets of the city, especially at night, as one could be hit by human waste thrown from the windows of people’s homes⁵⁸.

In the first half of the 1st century CE, medical encyclopedist Aulus Cornelius Celsus wrote his six-volume *De Medicina*, of which the part about diet, pharmacy, and surgery in early Imperial Rome has survived to this day⁵⁹. He presented the medicine of Hippocrates to the Romans and recommended various kinds of baths, massages, hygiene, and dietary rules in his detailed health advice. He analysed at length the diseases of the stomach, concluding that it was better to keep the bowels open through diet rather than purgatives, yet never referring to places in which to evacuate. Celsus recommended visiting the Baths various times for good health. Kolowski-Ostrow concludes that ‘*Celsus and the other good doctors*’ never suggested using public toilets as places to go to for health reasons, which could be because they were not salubrious places⁶⁰. Perhaps they are not mentioned because sending patients to baths meant they were using public facilities there⁶¹.

In recent years studies on the senses have opened a new field of interest on how in antiquity people perceived odours and perfumes, revealing how they did not feel any disgust with various smells and sights objectionable by contemporary standards. As Porter states: ‘*Today’s history comes deodorised*’⁶². Our extreme sensitivity is a recent phenomenon linked with a slow but gradual sophistication in manners that started in the Renaissance and reached modern times⁶³, causing scholars to depict an altered reality of everyday life. In antiquity, many

smells were inevitable, with exceedingly pungent smells particular to definite exercises, like tanneries, *fullonicae* and companies producing *garum* (fish sauce), required to have their trade in specific areas where the penetrating smells were less perceptible. In *foricae*, scented oils and herbs were used⁶⁴, and archaeological evidence from Alexandria of Egypt shows that ash was used to neutralise the *excreta* stink in the sewer channels below the toilet seats, a practice probably used in many places⁶⁵ and still used today in rural settlements. Studies on the social relevance of smell and the role that culture plays in how it is interpreted are relatively recent. Sense of smell is recognised as a social phenomenon with specific meanings and values for different cultures in different historical periods. Studies on hygiene, sacred customs, sexuality, and culinary practices have addressed the importance of smell in antiquity. Bradley⁶⁶ explored how this sense contributes to our perceptions of ancient life by playing an active part in a wide range of domains and activities: medicine and philosophy, religion, botany and natural history, erotic literature, urban planning, sanitation, social life such as dining and festivals, satire, and comedy. Greek and Roman authors often associate odours affecting their senses with the social, political, and cultural position of the people and environments they encounter. For example, Aristotle, to the synergies, characterisations, and judgements⁶⁷, Martial to the *olentes* (those who smell) of Rome or Galen who believed smell spread contagion quickly⁶⁸.

The stink was removed through adequate drainage and sewer infrastructure. In the 4th century BCE, with Hippodamian city planning, many settlements were provided with a capillary distribution of water channels, drains and sewers under the streets and houses. Examples of installations found in Olynthus are evidence of private toilets at this time.

Rising attention to waste introduces the need for a distinct communal architectural design of a public facility to be used simultaneously by more than one person and all sitting next to each other. In Roman times their diffusion reached every part of the Empire, some possessing a capacity of 60/70 people and with sumptuous decorations of excellent quality. They became a symbol of local elite authority and dynamic public identity, a consolidated piece of urban infrastructure endorsed by all levels of society.

⁵⁵ CIL IV, 664.

⁵⁶ Petronius Arbiter. Petronius. 71, 8. Michael Heseltine (London: William Heinemann, 1913). URL: <http://data.perseus.org/citations/urn:cts:latinLit:phi0972.phi001.perseus-engl:71>. (Accessed: 2 Oct. 2016).

⁵⁷ Alfred Trevor Hodge, *Roman Aqueducts and Water Supply* (London: Bristol Classical Press, 1992), 478, footnote 24.

⁵⁸ Juvenal, 3. 296–305.

⁵⁹ https://www.dizionario-latino.com/autori/aulus_cornelius_celsus.php.

⁶⁰ Ann Olga Kolowski-Ostrow, ‘Cacator cave malum; the subject and object of Roman public latrines in Italy during the first centuries BC and CE’, in *History of water management and hydraulic engineering in the Mediterranean Region; Cura aquarum in Sicilia*, ed. Gemma Jansen, *BABesch* Supplement Series 6 (Leuven-Paris-Walpole (MA): Peeters, 2000): 292–293.

⁶¹ Chapter 2.

⁶² Roy Porter, ‘Foreword’, in *The Foul and the Fragrant: Odor and the French Social Imagination*, ed. Alain Corbin (Leamington Spa/Hamburg/New York: Berg Publishers, 1986): v-vii.

⁶³ Wolf Liebeschuetz, *Rubbish disposal in Greek and Roman cities, in Sordes Urbis: la Eliminación de residuos en la ciudad romana, Actas de la reunion de Roma (15–16 de noviembre 1996)*, eds. Josep Anton

Remolá Vallverdu, Xavier Dupré Raventós, *Bibliotheca Italica* 24 (Roma: L’Erma di Bretschneider, 2000): 51–61.

⁶⁴ Barry Hobson, *Latrinae et Foricae, Toilets in the Roman World* (London: Duckworth, 2009), 108.

⁶⁵ Mieczysław Rodziewicz, ‘Reports on the excavations at Kom-el-Dikka in Alexandria in 1983–1984’, *Bulletin de la Société Archeologique d’Alexandrie*, 44 (1991): 105–106.

⁶⁶ Mark Bradley, ed., *Smell and the Ancient Senses* (London and New York: Routledge, 2015).

⁶⁷ See on the topic, Mark A. Johnstone, ‘Aristotle on Odour and Smell’, *Oxford Studies in Ancient Philosophy*, 43, (2012): 143–83.

⁶⁸ Mark Bradley, ‘Foul bodies in Ancient Rome’, in Bradley, 2015: 133–45.

1.3. *Latrina* and *forica*: terminology

Ancient Greek and Latin writers used a variety of words to define restrooms. Thedenat gave a list at the beginning of the 20th century in the *Dictionnaire des antiquités grecques et romaines*⁶⁹. Ancient Greek authors referred to them in many ways⁷⁰, but the contexts in which they are mentioned imply that they were of the private type, never public multi-seaters⁷¹. Latin sources used *latrina*, *secessus*, *sella*, *lasanum*, and of later date *necessarium*⁷² to describe toilets. The preferred word was *latrina* when referring to a private toilet or when generically expressing its concept as a place⁷³. The only author who added to *latrina* the adjective *publica* because he was referring to a public toilet was Suetonius in an anecdote on how poet Lucanus showed his disrespect for emperor Nero in a public facility⁷⁴.

The term *forica* is only found in the *Satyra* by Juvenal when he refers to the activities of the ambitious new Roman politicians, whom he despises, and how they are constantly focused on contracting new public work projects amongst which toilets (*conducunt foricas*)⁷⁵. The context is that of a public type. Etymologically *forica* derives from the word *foria*, which the Roman grammar

Nonius Marcellus, in the 4th (or 5th) century CE, explains as *stercora liquidiora* (liquid bowel movements)⁷⁶. From *forica* derives *foricarius* a contract person appointed by the authorities to look after the *forica*⁷⁷.

In a recent study, Calvigioni argues that the use of the term *latrina* for private installations and *forica* for public installations should be corrected. It is only scholarly and modern for researchers to distinguish between the two types⁷⁸. In her work, the author also discusses how the word *forica* is intended more as a public sewer than a public toilet itself⁷⁹, concluding that using *latrine* is more objective and ‘describing the place without too many implications’⁸⁰. From an architectural point of view, if the word *forica* means public *cloaca* (sewer)⁸¹, it better describes a place where a long section of public sewer was necessary to accommodate more than one or two people on seats above it⁸². In this way, it more appropriately describes a public facility, where *latrina* needs the adjective *publica* or the circumstances made clear by the text to become a synonym of the same place⁸³. Therefore, in this study, *forica* is the term of choice to define any installation with several seats accessible to many people.

1.4. The question of gender use in *foricae*

Until relatively recent times, research on the lives of women in ancient Greece and Rome was done through the surviving sources, all written by men. As a result, nearly everything we knew about Roman women was filtered through the lens of how Roman men viewed them, mainly in the context of remarkable events to reinforce dominant ideologies about women’s weaknesses/roles and the corresponding rights of men. Up to recently, civic spaces were all male coded. However, material evidence, primarily epigraphy and iconography⁸⁴, shows that the definition of particular places as gendered must be corrected. Multi-perspective studies in ancient urban planning devalue the dichotomy of ‘public’ and ‘private’

⁶⁹ Henri Thedenat, ‘Latrina’, in *Dictionnaire des antiquités grecques et romaines*, eds. Charles Victor Daremberg, Édmond Saglio, III.2 (1900): 987–991.

⁷⁰ With transliteration: *anankaia*, *aphedron*; *apopatos*; *aphodos*; *hedra*; *hipnos*, *koprodochos*.

⁷¹ Only Aristophanes in *Plutus*, there is a reference which could be connected to a public facility when the priest complains to Chremylus about how nobody went anymore to the temple to take offerings but only to use it as a place to relieve themselves. Rather than specifying a building, it seems to refer to open areas, maybe dumps, where people defecate when nature calls. Aristophanes, *Plutus*, 1184. <http://data.perseus.org>. (Accessed 3/7/2016).

⁷² Günther E. Thüry, ‘Das Römische Latrinenwesen im Spiegel der literarischen Zeugnisse’, in *Roman Toilets*, 2011: 43–47.

⁷³ Suetonius writes how it becomes a crime to wear a ring or carry coins with the emperor’s profile on them when using the toilet under Tiberius. Suet., *De Vita Caesarum, Tib.*, 58: “*Damnato reo paulatim genus calumniae eo processit, ut haec quoque capitalia essent: circa Augusti simulacrum servum cecidisse, vestimenta mutasse, nummo vel anulo effigiem impressam latrinae aut lupanari intulisse, dictum ullum factumve eius existimatione aliqua laesisse*” (“After the defendant had been condemned, this kind of accusation gradually went so far that even such acts as these were regarded as capital crimes: to beat a slave near a statue of Augustus, or to change one’s clothes there; to carry a ring or coin stamped with his image into a privy or a brothel, or to criticize any word or act of his”, translation: <https://penelope.uchicago.edu>).

⁷⁴ Suet., *De Poetis, Vita Lucani* 57,7: “*Adeo ut quondam in latrinis publicis clariore com strepitu ventris emissihemistichium Neronis magna consessorum fuga pronuntiariit ‘Sub terris tonuisse pute’*” (“Once for example in a public privy, when he relieved his bowels with an uncommonly loud noise, he shouted out this half line of the emperor’s, while those who were there for the same purpose took to their heels: ‘You might suppose it thundered ‘neath the earth’”. Translation: <https://penelope.uchicago.edu>).

⁷⁵ Juv., *Satires*, 3.36–40: “. . . *munera nunc edunt et, verso pollice vulgus quem iubet, occidunt populariter; inde reversi conducunt foricas, et cur non omnia, cum sint quales ex humili magna ad fastigia rerum extollit quotiens voluit Fortuna iocari?*” (“. . . today they hold shows of their own and win applause by slaying with a turn of the thumb, whomsoever the mob bids them slay; from that they go back to contract for cesspools, and why not for any kind of thing, seeing that they are of the kind that Fortune raises from the gutter to the mighty places of earth whenever she wishes to enjoy a laugh?”. Translation: G.G. Ramsey, <https://www.tertullian.org>).

⁷⁶ See the different derivatives in Silvia Calvigioni, ‘Latrine pubbliche nel mondo romano. Alcune osservazioni sulla terminologia e sul caso di Ostia Antica’ *ArchCl*, LXIX (2018): 811–834. Specifically, 818. Already in the 1st century CE Varro, in *De Re Rust.* 2.3.5, used the term *foria* to define an unspecified disease of cattle, which is translated by successive authors as diarrhea, James Noel Adams, *Pelagonius and Latin Veterinary Terminology in the Roman Empire*, Studies in Ancient medicine 11 (Leiden/New York/Köln, E.J. Brill, 1995), 331.

⁷⁷ Jus., *Dig., De Usur.*, Paul., 22, 1, 17, 5.

⁷⁸ Calvigioni, 2018, 815.

⁷⁹ Calvigioni, 2018, 820–822.

⁸⁰ Calvigioni, 2018, 822.

⁸¹ Calvigioni, 2018, 820.

⁸² See Chapter 3.2.

⁸³ For example, in Tertullian (Pal., 4, 10): “*Et cum latrinarum antistes sericum uentilat et immundiore loco ceruicem monilibus consolatur et armillas. . .*” (“And when the overseer of latrines fans her silken gown, and comforts with necklaces her neck that is less pure than the place itself. . .”. Translation: Vincent Hunink, *Tertullian, De Pallio. A commentary by Vincent Hunink*, (Amsterdam. J.C. Gieben Publisher, 2005): 54–55.

⁸⁴ Milestone in this study is the work of Susan Treggiari, ‘Jobs for Women’, *American Journal of Ancient History* 1 (1976): 76–104; *ibid.*, ‘Lower Class Women in the Roman Economy’, *Florilegium* 1, 1, UTP Journals, (1979): 65–86.

spaces, observing that many public places host dynamic multifunctional activities that automatically interweave gender and class⁸⁵. Despite the legal, ideological and cultural limitations, women have played a vital role in the Roman economy, not only as a part of the workforce but also as entrepreneurs⁸⁶. Women were involved and essential in the maintenance of the organized community of Rome and the Empire⁸⁷. Some women appeared as public benefactors and sponsors between the 1st and 2nd centuries CE. During the Antonine period, they were commemorated by public statues and inscriptions of buildings, in most of the cities of Italy and the Western Provinces⁸⁸. In the Baths of Lepcis, an inscription bearing the name of Eirene, a benefactor in the time of the emperor Commodus, is an example of public recognition⁸⁹. Some ancient sources speak of women at Roman Forum events as gladiators or spectators of games⁹⁰; places are often referred to as used by children and women. Lower-class women worked as cooks, bartenders and waitresses in stores and in markets as saleswomen⁹¹. Freedwomen or slaves were actual *officinatores* (brick makers); some were

businesswomen, owners of brick factories or importers of goods⁹².

An activity that played an essential role in shaping the use of space and negotiating gender was bathing; ancient texts and art suggest that baths appealed to all, regardless of their wealth, colour, creed, or gender. Mixed baths were unpopular in the Republic; plans show how many baths were built with two separate sections, one for women and one for men, to accommodate all. In the Imperial times when, under emperor Claudius in the 1st century CE, most baths had developed a new architectural idea of a gender-free establishment by building only one set of rooms, not two separate sections⁹³. Given the dominant atmosphere of nudity at the baths, whether complete or partial, the attested bathing between men and women first shocked many conservative sensibilities⁹⁴. However, although not to everyone's liking, women are cited in the literature using baths with men at least up to the 4th century CE⁹⁵. Later, although some Christian sources criticised and condemned the public bathing of women⁹⁶, it never stopped being widespread among all different classes, proving that most people did not care or were not bothered by this type of activity⁹⁷. Bathhouses were inclusive, not exclusive, the epitome of democratic institutions and ideas. Recent studies by Whitmore on small artefacts confirm this and provide critical data on the social atmosphere of Roman baths⁹⁸. These objects, found in drains and sewers, testify to the presence of women and children in military baths during the Roman Empire, suggesting that they were always a significant component of these environments. Although examining toilet sewer stratigraphy does not always provide precise information about the users⁹⁹, it is interesting to note how the same primary activities—adornment, bathing, eating, and drinking, were performed by men and women (and likely children) in every bath examined by the scholar¹⁰⁰.

⁸⁵ The in-depth analysis of the differences in these roles and the geographical distribution of the evidence is beyond the scope of my research. For relevant studies on the topic and bibliography see Kostantinos Mantas, 'Independent Women in the Roman East: Widows, Benefactresses, Patronesses Office-Holders', *Eirene*, XXXIII (1997): 81–95; *ibid.*, 'The incorporation of girls in the educational system in Hellenistic and Roman Greece', *Polis*, 24 (2012): 77–89; Mary T. Boatwright, 'Women and Gender in the Forum Romanum', *Transactions of The American Philological Association*, American Philological Association, 141, Fasc. 1 (Baltimore, Spring 2011): 105–141; Emily A. Hemelrijk, Greg Woolf, eds., 'Women and the Roman City in the Latin West', *Mnemosyne*, Suppl. 360 (E.J. Brill: Leiden /New York / Köln, 2013); Emily A. Hemelrijk, *Hidden Lives, Public Personae. Women and Civic Lives in the Roman West* (Oxford: Oxford University Press, 2015); Emily A. Hemelrijk, 'Women's daily life in the Roman west', in *Women in Antiquity, Real women across the Ancient World*, eds. Stephanie Lynn Budin, Jean MacIntosh Turfa (Abington: Routledge, 2016): 895–904; Monika Trümper, 'Gender and space, "Public" and "Private"', in *A Companion to Women in the Ancient World*, eds. Sharon L. James, Sheila Dillon (London: Wileys, 2015): 288–303; Monika Trümper, 'Gender-differentiation in Greek public baths', in *SPA. Sanitas Per Aquam. Tagungsband des Internationalen Frontinus-Symposiums zur Technik – und Kulturgeschichte der antiken Thermen Aachen, 18.–22. März 2009*, *BABesch* Suppl. 21 (Leuven: Peeters, 2012): 37–45; Hilary Becker, 'Roman women in the urban economy: occupations, social connections and gendered exclusions', in *Women in Antiquity, Real women across the Ancient World*, eds. Stephanie Lynn Budin, Jean MacIntosh Turfa (Abington: Routledge, 2016): 915–931.

⁸⁶ Piotr Berdowski, 'Some remarks on the economic activity of women in the Roman Empire: a research problem', in *Haec mihi in animis vestris templa. Studia Classica in Memory of Professor Lesław Morawiecki*, Rzeszów 2007, eds. Piotr Berdowski, Beata Blahaczek (Rzeszów: Instytut Historii UR, Rzeszów, 2007): 283–298.

⁸⁷ Amy Russell, 'On Gender and Spatial Experience in Public: The Case of Ancient Rome', in *TRAC 2015: Proceedings of the Twenty-Fifth Annual Theoretical Roman Archaeology Conference, Leicester*, eds. Matthew J. Mandich, Thomas J. Derrick, Sergio Gonzalez Sanchez, Giacomo Savani, and Eleonora Zampieri (Oxford: Oxbow Books, 2016): 164–176.

⁸⁸ Boatwright, 2011, 128–130.

⁸⁹ Chapter 8.5.

⁹⁰ Brunet, 2014.

⁹¹ Lin Foxhall, *Studying Gender in Classical Antiquity, Key Themes in Ancient History* (New York: Cambridge University Press, 2013), 97–98. For Ostia see Lena Larsson Lovén, 'Female lives in *Portus Augustus Ostiensis*', in *Mehr Licht, More Light, Più Luce: Studia in honorem Arja Karivieri*, eds. Katariina Mustakallio, Minna Silver, Simo Örmä (Turku: Sigillum, 2020): 137–147.

⁹² Penelope M. Allison, 'Engendering Roman domestic space', in *Building Communities: House, Settlement and Society in the Aegean and Beyond. Proceedings of a Conference held at Cardiff University, 17–21 April 2001*, eds. Ruth Westgate, Nick Fisher, James Whitley, *BSA Studies* 15 (London: The British School of Athens, 2007): 343–350. Specifically, 347.

⁹³ Ward, 1992, 131.

⁹⁴ Garrett G. Fagan, *Bathing in Public in the Roman World* (Ann Arbor: The University of Michigan Press, 2002), 26.

⁹⁵ Ward 1992, 139. Some emperors tried to limit promiscuity by allotting different times of the day to the two sexes, but the ancient literature is debatable on the topic. *Ibid.*, 140–142, for analysis and scholarly references.

⁹⁶ Ward, 1992, 140–146; Sadi Maréchal, 'Washing the Body, Cleaning the Soul. Baths and Bathing habits in a Christianizing Society', in *Antiquité Tardive*, 28, (2020), 167–176. Specifically, 170.

⁹⁷ Ward, 1992, 147.

⁹⁸ Alissa Marie Whitmore, 'Small finds and the social environment of the Roman baths', PhD (Doctor of Philosophy) thesis, University of Iowa, 2013. DOI: <https://doi.org/10.17077/etd.tr4qgl2i>

⁹⁹ Stefanie Hoss, Alissa Whitmore, 'Introduction: Small finds and ancient social practices', in *Small Finds and Ancient Social Practices in the Northwest Provinces of the Roman Empire*, eds. Stefanie Hoss, Alissa Whitmore (Oxford: Oxbow, 2016): 1–6. Specifically, 3.

¹⁰⁰ Baths of Caerleon Fortress (UK), Stabian Baths and Forum Baths of Pompeii (Italy), Forum Baths of Herculaneum (Italy), East Baths of Mirobriga (Portugal), Baths of Augusta Raurica (Switzerland),

How should the use of *foricae* by women be considered in this context? The assumption that the intimate and essential toilets for women were only in areas where it was respectable for them to linger is outdated¹⁰¹. As in many other cases in everyday life, there were no general guidelines or regulations; toilet use varied depending on the situation. When the presence of women was recognised, it followed that it had to be possible for them to have access to public facilities irrespective of gender. Although it may not have been well-viewed to see women in these public amenities, or maybe they did not want to be seen in certain places, it was inevitable that one had to take care of the call of nature. The needs of the body are not gendered. The location and accessibility of the urban space differed according to activities and events¹⁰². If women were in a public zone for work, festivals, or entertainment, they should have access to *foricae*. In those complexes, where two rooms were used as *foricae*, it is commonly thought that one would be for men and the other for women. However, other explanations are possible. For example, it could be that due to the significant number of people at the complex, it was necessary to provide a fair number of toilets for all or, as in the case of the Hellenistic Baths in Egypt (Tell Har, Buto), because the baths offered different programmes for visitors to take part in¹⁰³. Another hypothesis is that, as in the baths of Karnak, they were serving a diverse pool of people, one for customers and one open to the streets¹⁰⁴.

If gender bathing rules vary by region, period, particular bathhouses, or a matter of personal choice¹⁰⁵, it can be stated that the same can be said for public toilets.

1.5. Why this book?

The work provides the first complete review of peristyle *foricae*¹⁰⁶. It advances the knowledge on ancient sanitation with its analysis of catalogue data¹⁰⁷ and with

the research of the three study cases examined: Kos, Lepcis Magna¹⁰⁸ and Gortyn.

The independent and free-standing *forica* of Kos (Greece)¹⁰⁹ is the most opulent with its incredible decorative apparatus. Built probably between the end of the 2nd and beginning of the 3rd century CE, it is the finest and most monumental peristyle type so far excavated, with many distinguishing elements that place it into Neudecker's rank of *pracht*, expensively embellished with sculpture, mosaics, and frescoes. The building was excavated by archaeologist Luigi Morricone in 1936 and submitted to an extensive *anastylosis*. This complex monument needed a comprehensive review process¹¹⁰. It was not just an ancient building; the *anastylosis* turned it into something 'new', representing 20th-century fascist propaganda with imperialist overtones. Peeling off the layers of the building brought to the surface questions to which only a new in-depth analysis with comparative research could provide the answers.

The two other case studies, the *foricae* in the Hadrianic Baths of Lepcis Magna (Libya)¹¹¹ and those of Gortyn (Crete-Greece), are relevant examples to confirm the growth and continuity of this specific typology of a public building in insular Greece and North Africa. Those of the Hadrianic Baths in Lepcis Magna are important in the context of monumental peristyle *foricae* connected architecturally to a Bath complex in the Roman provinces.

The three *foricae* of Gortyn (Crete) are all in the Praetorium area and date to different centuries (2nd, 3rd, and 4th centuries CE). It is unusual to encounter so many in such a limited area¹¹². Of the three, only one, the *Latrina*

Military Baths of Weissenburg (Germany), Dover shore Fort baths (UK), Silchester public Baths (UK), Red House Baths (UK), Castell Collen (UK), Ribchester (UK) and Republican baths (Italy).

¹⁰¹ Neudecker, 1994, 64.

¹⁰² Trümper, 2015, 302.

¹⁰³ Fournet, Redon, 2013, 260.

¹⁰⁴ Mansour Boraik, Salah El-Masekh, Thibaud Fournet, Pauline Piraud-Fournet, 'The Roman Baths at Karnak, Between River and Temples. Architectural Study and Urban Context', in *Collective Baths in Egypt 2: New Discoveries and Perspectives, ÉtUrb 10*, ed. Béangère Redon (Cairo: Institut français d'archéologie orientale, 2017): 221–266. Specifically, 235.

¹⁰⁵ Fagan, 2002, 27.

¹⁰⁶ What was consolidated of this plan type were general concepts masterfully expressed by Richard Neudecker in his 1994 publication: where the focus was on the distinguishing characteristic of prestige (*pracht*) of ancient public toilet facilities. Other scholars, over the years have simply reprocessed his ideas in describing the typology.

¹⁰⁷ The only existing inventories were in Neudecker (Neudecker 1994) and Bouet (Bouet 2009). Neudecker included only those he analysed in his research and of the *pracht* typology. Bouet published a complete catalogue of those in the Northern Provinces with a classification system based on sewage characteristics. Not valid for plan determination as the number of drains present is not a *forica*'s distinguishing factor but more a choice caused by the water supply and the sewer infrastructure available. The inventory published here is of essential data of all known *foricae*, like geographical area, location, date, plan type, decorative features,

important details (if any), and an essential bibliography with information and reference to the plan of each toilet. Difficulties were encountered in data collection. Many sites had poorly referenced sanitary-related data; in some, the early excavators had given extravagant definitions and functions to the rooms; some are no longer visible due to poor conservation or because the areas have been reclaimed by nature over the decades. The catalogue provides invaluable data for advancing knowledge of the public facilities. With new excavations, materials will need to be kept up to date. Nevertheless, it is a good starting point for each public toilet's essential bibliography, dating, location and plans (where possible).

¹⁰⁸ The delicate political situation in Libya allowed only a brief visit to the archaeological area in 2014. Providentially most of the original research evidence is in the Archives of the University of Macerata, where the late Professor Di Vita granted me access and use of data for this research.

¹⁰⁹ The Director of the Italian Archaeological School, Emanuele Papi, authorised research of all the material in the School archives for this study. I would also like to remember the late Antonino Di Vita, the director when this research began many years ago.

¹¹⁰ The previous information was the preliminary conclusions reached by Morricone at the end of the excavation and *anastylosis*. Luigi Morricone, 'Scavi e ricerche a Coa (1935–1943), Relazione Preliminare', estr. *BdA* I, III, IV (1950): 219–245.

¹¹¹ These monumental *foricae* of the 2nd century CE in a Roman province of significant prosperity and importance, were fully excavated in 1927 and described in Renato Bartocchini, *Le Terme di Lepcis* (Bergamo: Istituto italiano di arti grafiche, 1929).

¹¹² Another interesting example is in the Kom el Dikka area in Alexandria Egypt, discussed in Chapters 5 and 6.

porticata, was published after its excavation¹¹³ but not contextualized in the study of hygienic facilities, whilst the other two, named by the archaeologists *vano 19* and *vano 23*, have only been superficially investigated¹¹⁴.

For the first time, this study addresses the architectural framework and the construction analysis of *foricae*¹¹⁵. The developmental stages of a building shed much light on the quantitative and qualitative analysis of what remains but to date, the focus of academics has been on buildings on a much larger scale¹¹⁶, with the idea that the architectural planning of smaller ones was somewhat less problematic because of the amount and size of construction materials necessary¹¹⁷. The analysis of the process of building a *forica* has highlighted the complexities of planning and the technological challenges associated with the location, design and demand of water and sewer systems. A well-defined example of a smaller building needed accurate project assessments and supervision before and during construction, indicating how the building is a process which contains variables independent of the structure's size.

In closing, one last observation. It is inevitable to cover aspects previously analysed and acknowledged by others, and some information in this book is already well-known and may appear redundant. However, what was included was deemed necessary to provide a clear picture of the topics covered and to supplement the analysis of the conclusions of this work.

¹¹³ Enzo Lippolis, 'Settore C', in *Gortina V.3. Lo scavo del Pretorio (1989–1995)*, ed. Antonino Di Vita (Padova: Bottega d'Erasmus, 2000), 389–513.

¹¹⁴ Past interference in the 1970s also undermines existing information about their soil levels. *vano 19* was also part of a simple *anastylosis* project in 1990 when professor Di Vita decided to re-erect the four peristyle columns.

¹¹⁵ See *History of studies* in this chapter.

¹¹⁶ The importance of understanding the details of a building under construction was first emphasized by DeLaine for the Baths of Caracalla in Janet DeLaine, 'The Baths of Caracalla: A study in the design, construction, and economics of large-scale building projects in imperial Rome', *JRA Supplement Series 25* (Portsmouth, Rhode Island, 1997). More recently Lancaster for the Colosseum in Lynne Lancaster, 'The Organization of Construction for the Superstructure of the Colosseum', in Rossella Rea, Heinz-Jürgen Beste, Lynne C. Lancaster, 'Il cantiere del Colosseo', *RMitt* 109 (2020): 341–375. Specifically, 361–374). See Tiziano Mannoni, Anna Boato, 'Archeologia e storia del cantiere di costruzione', in *Arqueología de la Arquitectura*, 1, (2002): 39–53, <https://arqarqt.revistas.csic.es/index.php/arqarqt/issue/view/1>; Stefano Camporeale, 'Archeologia dei cantieri di età romana', in *Archeologia dell'Architettura*, XV (Sesto Fiorentino: All'Insegna del Giglio, 2010): 171–180. Also, the series *Arqueología de la Construcción*, dedicated to studies of ancient building sites, their workings and organisation.

¹¹⁷ Brian Howard Sahotsky, *The Roman Construction Process: building the Basilica of Maxentius*, UCLA Electronic Theses and Dissertations, 2016. <https://escholarship.org>, 7.

