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Incurring the wrath of Mars: sanitation and hygiene in Roman North Africa

Andrew Wilson

Pliny regarded the sewers of Rome as the most noteworthy achievements of that city,¹ and the twentieth-century visitor to Roman sites is often impressed by the extensive remains of under-street drainage provision. Examples may be seen in many of the well-preserved towns of North Africa: the colony of Timgad, founded in AD 100, had a network of drains under its regularly planned streets, with manholes at street intersections, while Lepcis Magna possessed sizable collector drains under its main streets, traceable in the paving patterns of the *cardo maximus*.

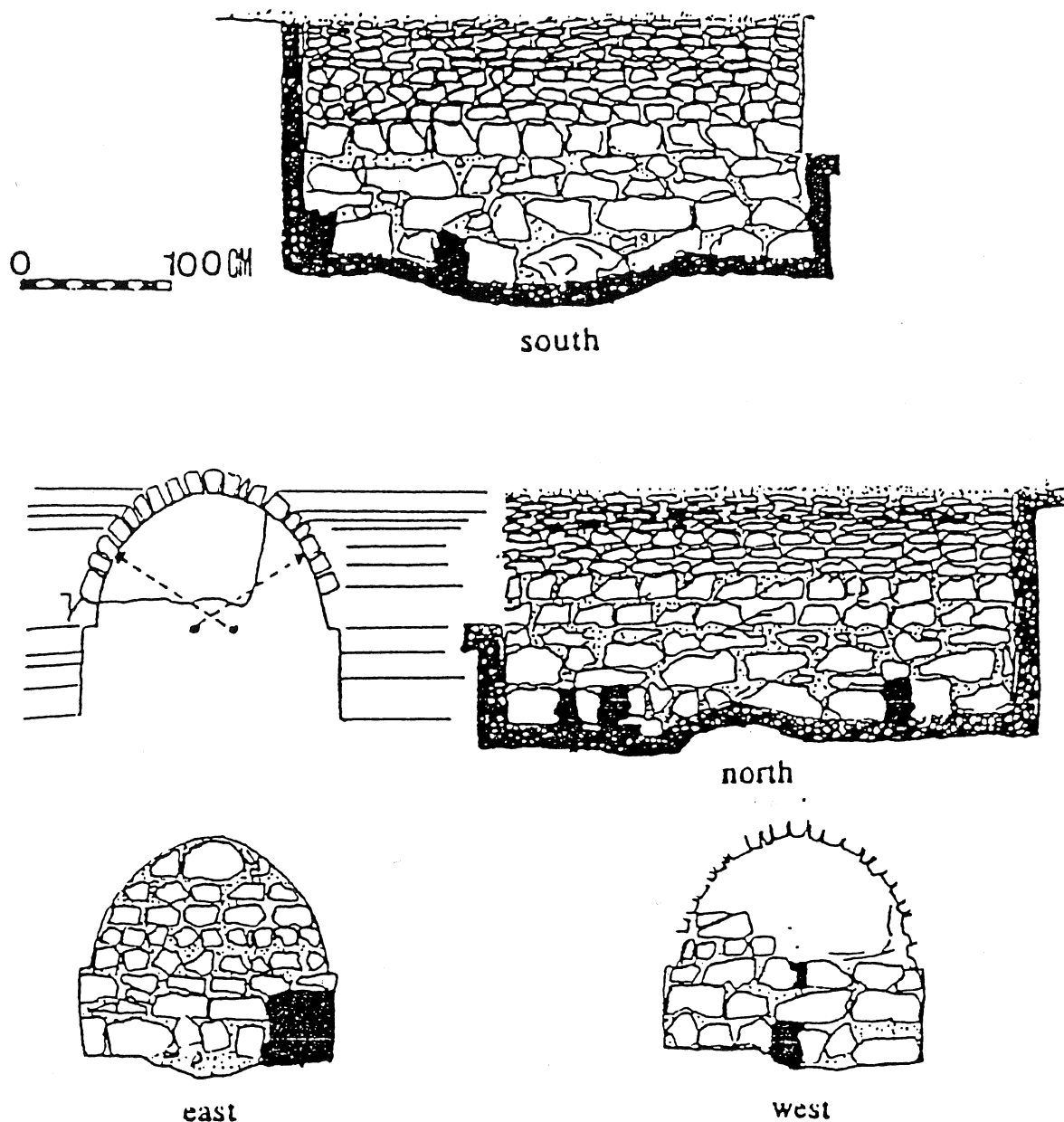
Views of the Roman hygienic achievement have alternately stressed the architectural splendour or questioned the sanitary reality.² Certainly many Roman drainage works are impressive, and public drainage and sewerage infrastructure surely surpassed anything found after the end of the Roman empire until the nineteenth century; but we need to distinguish between the scale of the material remains and the degree of efficiency with which they functioned. One does not necessarily imply the other, and in this paper I shall explore the implications of the archaeological evidence for the standards of public hygiene actually achieved in the towns of North Africa. I shall look firstly at drainage infrastructure, then at public and private toilets, and finally at evidence for public excretion and waste disposal.

PUBLIC DRAINAGE INFRASTRUCTURE

It is no coincidence that the largest and most extensive drainage networks are seen in colonial foundations. At Timgad the town planners, unhampered by the constraints of a pre-existing urban street plan, could design an orthogonal street grid with associated drainage system, with tributary drains under side streets feeding into collectors under the main thoroughfares. Drains to cope with surface runoff were planned from the colony's foundation, unlike the aqueduct water distribution network which was a later addition.³ Likewise at the Nervan colony of Cuicul (Djemila) most streets had drains;⁴ outside North Africa Köln and Trier possess two of the largest collector drains in the Roman world, also apparently built

when these colonies were founded.⁵ New construction projects might also provide the opportunity for enhancing drainage provision: the Severan colonnaded street at Lepcis Magna was equipped with a vast collector drain 1.6 m wide by 3.0 m high internally to cope with runoff from torrential downpours.⁶ Besides the ease of installation in new colonial foundations, in contrast to the difficulties of retro-fitting a drainage network to a town that had evolved piecemeal over centuries, there may also have been an association with civic status if drainage systems were consciously perceived as a marker of Romanised society.

The size of the main collectors was conditioned as much by the need for human access for cleaning as by the volume of water to be carried. Gradients of Roman drains were generally insufficient to prevent suspended matter from settling, and periodic cleaning was required, as implied by the access manholes at Timgad or the section of the *decumanus* drain at Tipasa which seems originally to have been covered by removable planks. Maintenance was the responsibility of *aediles*, and was probably performed by condemned criminals and public slaves,⁷ although at Antioch Libanius (*Or.* 46.21) indicates that it was a civic duty of the shopkeepers (presumably in return for the right to trade). The shopkeepers at Antioch complained about the danger of asphyxiation while performing their task, and sewer-workers must also have been exposed to health risks from faecal matter and to conditions such as leptospiral jaundice (Weil's disease) transmitted by rats.⁸ Organic deposits in drains imply the presence of vermin, and the lack of odour traps must have entailed a pervasive smell of drains throughout all ancient towns. Drains were sometimes underspecified; at Cap Zébib near Bizerte in Tunisia two superimposed street levels were excavated, each with its own set of stone-lined and covered drains, c. 0.5-0.6 m square in cross section. Both sets of drains were entirely clogged with mud, and the streets above covered with a thick mud deposit. The stratigraphy is not published in detail, but a possible interpretation is that the settlement was overwhelmed by alluvium from torrential runoff with which the drains were unable to cope; a new street surface with its own drains was built over the old one, and the process later repeated itself.⁹



1. Soakaway chamber at Taucheira (Tocra, Cyrenaica) in a mid/late Roman industrial complex (Buzaian 1994, fig. 16).

Not all towns or urban districts possessed under-street drainage. At Berenice (Sidi Khrebish, Benghazi) domestic waste discharged into soakaway pits in the street outside.¹⁰ At Taucheira (Tocra, also in Cyrenaica) a late Roman or Byzantine complex was provided with short channel drains leading into two vaulted underground chambers (2.3-3.3 m long

by 1.6-2.0 m wide), which acted as soakaways for waste from manufacturing activities (*Fig. 1*). The waste leached into the bedrock through the unmortared joints of the masonry walls.¹¹ This appears to be a response to the problem of disposing of significant quantities of predominantly liquid waste in an area with no street drainage. Soakaway drainage was

not restricted to Cyrenaica; at Sétif a soak pit ('un puits absorbant') seems to have drained water from pools in a set of public baths,¹² and a soakaway has recently been identified at Bir Ftouah, Carthage, disposing of water from a church baptistery.¹³ The lack of other reported examples may simply result from their having been missed or ignored in excavations elsewhere.

LATRINES

I turn now to Roman public toilets, one of the most visually striking aspects of sanitary architecture. Frequently they were sited next to or within public baths, though often accessible also from the street outside, where they could take advantage of the overflow or outflow from the pools to flush them. Whether such flushing was continual or periodic will of course have depended on whether the baths were fed by continuous inflow and therefore overflowed constantly, or whether the pools were filled and emptied several times per day. The largest sets of latrines are of course associated with the vast imperial-type *thermae* – as for example the latrines of the Hadrianic Baths at Lepcis Magna, and the two semicircular exedra latrine complexes of the Antonine Baths at Carthage, so large that one was originally thought to be a temple or a theatre.¹⁴ A shattered granite basin lies in the centre of the west hemicycle. Although the water systems of these baths have not been fully investigated, it is likely that in both cases the latrines were flushed by pool outflow, and if so, they were



2. Seat with dolphin armrests in the toilets by the forum at Timgad.

probably continually flushed, as the cold pools at least of these baths were too large for periodic emptying and refilling, and required constant circulation of their water. By contrast, absence of overflow arrangements in the pools of the Memmian Baths at Bulla Regia¹⁵ implies periodic emptying and filling of pools, and therefore periodic rather than continual flushing of the adjacent latrines sited over the outflow drain from the baths.¹⁶ The frequency or otherwise of flushing will evidently have affected the atmosphere and smell inside public latrines.

The architectural splendour of Roman latrines has been studied by Neudecker (1994), and grandiose arrangements such as those of Timgad, with generously proportioned thrones equipped with dolphin armrests, have become almost a byword for the sophistication of Roman public hygiene (*Fig. 2*). Analysis of how they functioned, however, tells a less salubrious story. A standard feature of such latrines is a channel in the floor running in front of the seats, frequently said to be for rinsing the sponge sticks with which one cleaned oneself. In his survey of Roman water supply Hodge¹⁷ has expressed reservations, suggesting instead that it was for carrying away spilt urine and for washing hands (although both functions together seem contradictory). However, at Timgad drain slits in the floor between the seats and the channel seem designed to cope with spillages (*Fig. 2*), while at Thugga in the Baths of the Cyclops spillages are clearly prevented from entering the channel by a raised border (*Fig. 3*). As a washbasin was provided (both here and in other latrines, as at Lepcis, Timgad, Carthage and Thamusia in Morocco – personal observation) it seems unlikely that the channel was for washing hands, although it could perhaps have served to provide water for washing one's anus. But rinsing of sponge sticks seems a more likely function, given the references to them in Seneca (*epist.* 70.20) and Martial (12.48.7) which seem to envisage them as regular equipment in any lavatory. The anecdote in Seneca relates the unpleasant story of a German gladiator who committed suicide by choking himself on a sponge stick; it implies that sponge sticks were normally kept in the latrines, presumably for communal use, and I would interpret a circular depression in the floor of the Thugga latrines by the end of the channel as the rest for a sponge stick when not in use (*Fig. 3*). Elsewhere sponge sticks might, for example, have stood in a bucket or jar. The hygienic implications, of course, of using a communal sponge stick rinsed only in water need no spelling out; this is the practical downside of the grandiose and visually impressive public latrines.



3. Toilets in the Baths of the Cyclops, Thugga. Note the raised lip to prevent spillages entering the water channel, and the circular depression in the foreground, probably a rest for the sponge stick.

Private toilets exist but are rarer than might be expected, given the number of elite houses with piped water supply. This reinforces suggestions I have made earlier that private water connections in North Africa were primarily a symbol of social status rather than a matter of practical convenience.¹⁸ In most cases private toilets, like public latrines, seem to have been flushed by waste water from another activity. Outflow from private baths flushed a two-seater latrine in the House of the Hunt at Bulla Regia, while the few flush latrines known from private houses at Volubilis are sited over the drain from the peristyle pool. Sometimes water for flushing private latrines was obtained by encroachment onto a public street, with the toilets built directly over the street drain, as

at Timgad in *insulae* 73 and 97.¹⁹ Thébert (1987, 380-381) suggests that the installation of private latrines, like that of private baths, was a development of the later empire to maintain an appropriate social distance between the rich and their clients. This deserves further investigation, but dating of such developments within houses is often poor and more scientifically controlled excavation is required to confirm that it is a late trend. Many rich houses remained without identifiable toilets, their inhabitants presumably using chamberpots or nearby public latrines.²⁰ Neither latrines nor kitchens have yet been found at Banasa, which seems to have had no under-street drainage.²¹

Houses without flushed latrines might instead have cesspits, as at Cosa, Pompeii and Herculaneum.²² A cesspit has been recognised in early Islamic buildings around the church at Berenice.²³ However, archaeological work in North Africa has concentrated largely on monumental aspects of urban form, with the result that there are very few well-excavated and published domestic quarters in which this phenomenon could be studied. The existence of cesspits therefore has to be assumed from parallels elsewhere, and perhaps from the fact that they would have provided a valuable source of fertiliser.²⁴

PUBLIC HYGIENE

I want to turn now to more *ad hoc* sanitation and waste-disposal practices for which little or no infrastructure was provided. The archaeological remains are less noticeable and more dispersed, but allow a tentative picture to be sketched. We are familiar from Pompeii with graffiti written by householders requesting passers-by not to defecate in the street, but the problem of public excretion was evidently more widespread, as shown by official notices such as a relief from Aquileia in northern Italy showing a *cacator*, squatting down with his tunic up around his waist, being blasted into eternity by Jupiter with a thunderbolt (Fig. 4).²⁵ In the Baths of Titus in Rome an inscription calls down the wrath of all the gods on anyone excreting or urinating at the baths (CIL VI.29848 b), while at Thigibba (Hammam Zouakra), a small town in the Tunisian Tell, an inscription carved in letters several cm high on the two piers of an honorific arch, probably the entrance to the forum, says *si qui hic urinam fecerit, habebit Martem iratum* – 'Anybody urinating here will incur the wrath of Mars'.²⁶ Even in the most public of places, then, such behaviour was clearly a nuisance requiring explicit prohibition.



4. *Cacator relief from Aquileia, now in Aquileia Museum (Inv. no. 50397). Courtesy of the Ministero per i Beni e le Attività Culturali – Soprintendenza B.A.A.A.S. del Friuli – Venezia Giulia.*

The problem may have been relieved in part by the provision of urinals for the convenience of passers-by and for the collection of urine for use in fulling. A row of coarse pottery jars discovered in an alley at Berenice (Sidi Khrebish) may represent such a group of urinals (*Fig. 5*).²⁷

Public refuse tips were common – several have been found at Carthage, and a very large one on the outskirts of Hadrumetum;²⁸ they were of course common elsewhere in the empire. Three dungheaps are known from Pompeii, and at Caistor-by-Norwich in Britain a refuse tip inside the Colchester gate grew to such proportions during the third century AD that it eventually blocked access to the gatehouse guard-room.²⁹ Scavenging animals and birds on dungheaps must have been a common sight on the outskirts of ancient towns. More macabre still are the contents of a cistern in a peristyle house, probably an inn, at Berenice. The inn seems to have been abandoned in the early third century, and among the pottery and food refuse (pig and sheep bones etc.) dumped in the cistern after that was a large amount of human skeletal material – two adults, one teenage girl, a child of five and about forty infants up to a few years old, together with the remains of twenty dogs, four cats



5. *Urinals in an alley at Berenice (Sidi Khrebish, Benghazi) (Lloyd 1977, Pl. XIa). Courtesy of the Society for Libyan Studies.*

and some donkey and horse bones. The disarticulated nature of the bones suggested that they had been redeposited from elsewhere, probably a refuse tip. The precise explanation for this is unclear, but it is evident that it reflects the near-total breakdown of normal waste-disposal and burial practices during a time of some crisis, probably (given the absence of indications of violence) a plague.³⁰

Close study of the sanitary infrastructure of Roman towns reveals, therefore, that considerable efforts and expenditure were often made by urban authorities to achieve hygienic conditions, but that these seem frequently to have fallen short in practice of the image suggested by their physical architecture, because of such factors as inadequate gradient of sewers, and ignorance of the precise mechanisms by which germs and disease were spread. In many cases these provisions were confined to the main streets and the large public toilets; less prosperous urban quarters often lacked under-street drains, and the soakaway technology at Berenice differs little in essence from that of Mohenjo-Daro in 3500 BC.

BIBLIOGRAPHY

- Allais, Y. 1933, L'alimentation en eau d'une ville romaine d'Afrique: Cuicul (Djemila), in: *Cinquième Congrès International d'Archéologie, Alger (14-16 avril 1930)*, Alger, 93-117.
- Barker, G.W.W. 1979, Economic life at Berenice, in: J.A. Lloyd (ed.), *Excavations at Sidi Khrebish, Benghazi (Berenice)* vol. 2, Tripoli, 1-49.
- Ben Baaziz, S. 1990, Le problème de l'eau dans l'Antiquité dans la région de Bizerte, in: *L'Afrique dans l'occident romain I^{er} siècle av. J.-C. – IV^e siècle ap. J.-C. Actes du colloque organisé par l'École française de Rome sous la patronage de l'Institut national d'archéologie et d'art de Tunis. (Rome 3-5 décembre 1987)*, Rome, 203-212.
- Broise, H./Y. Thébert 1993, *Recherches archéologiques Franco-Tunisiennes à Bulla Regia*, vol. 2, Rome.
- Buzaian, A.M. 1994, *Excavations at Tocra (1985-1993). Urban transformation in the late antique phases*, MA Thesis, School of Archaeological Studies, University of Leicester.
- Cahen, A. 1873-1874, Notice sur les thermes romaines de Sétif, *RecConstantine* 16, 301-303, Pl. VI-I.
- Carton, L. 1911-1912-1913, Le 'Monte Testaccio' de Sousse, *Bulletin de la Société archéologique de Sousse* 16, 65-123.
- Dureau de la Malle, A. 1835, *Recherches sur la topographie de Carthage*, Paris.
- Fuhrmann, H. 1941, Archäologische Grabungen und Funde in Italien und Libyen, *AA*, 329-733.
- Hodge, A.T. 1992, *Roman Aqueducts & Water Supply*, London.
- Jansen, G.C.M. 1991, Water systems and sanitation in the houses of Herculaneum, *MededRom* 50, 145-166.
- Koloski-Ostrow, A.O. 1995, Latrines, baths and health in post-earthquake Pompeii, *AJA* 99, 317.
- Lloyd, J.A. (ed.) 1977, *Excavations at Sidi Khrebish, Benghazi (Berenice)*, vol. 1, Tripoli.
- Lohmann, H. 1979, Beobachtungen zum Stadtplan von Timgad, in: *Wohnungsbau im Altertum*, Diskussionen zur archäologischen Bauforschung 3, Berlin, 167-187.
- Neudecker, R. 1994, *Die Pracht der Latrine. Zum Wandel öffentlicher Bedürfnisanstalten in der kaiserzeitlichen Stadt*, München.
- Picard, G.C. 1947, Second rapport sur l'activité du Service des Antiquités de la Tunisie pendant l'année 1947, *BAParis*, 366-83.
- Rawlinson, J. 1958, Sanitary engineering: sanitation, in: C. Singer, E.J. Holmyard, A.R. Hall and T.I. Williams (eds), *A history of technology* vol. 4, Oxford, 504-519.
- Scobie, A. 1986, Slums, sanitation and mortality in the Roman world, *Klio* 68.2, 399-433.
- Scrinari, V.S.M. 1972, *Museo archeologico de Aquileia: Catalogo delle sculture romane*, Roma.
- Taylor, M.V. 1935, Roman Britain in 1934. 1. Sites explored, *JRS* 25, 201-23.
- Thébert, Y. 1987, Private life and domestic architecture in Roman Africa, in: P. Veyne (ed.), *A history of private life: from pagan Rome to Byzantium*, Cambridge, Mass./London, 313-409.
- Thouvenot, R. 1954, *Publications du Service des Antiquités du Maroc* 11.
- Ward-Perkins, J.B. 1994, *The Severan buildings of Lepcis Magna*, London.
- Wilson, A.I. 1995, Running water and social status in North Africa, in: M. Horton and T. Weidemann (eds), *North Africa from Antiquity to Islam*, Bristol, 52-56.
- Wilson, A.I. 1997 *Water management and usage in Roman North Africa: a social and technological study*, D. Phil. Thesis, University of Oxford.

NOTES

- ¹ Plin. *nat.* 36.104: 'Opus omnium dictu maximum'.
- ² Neudecker 1994; Scobie 1986; see other papers in this volume.
- ³ Lohmann 1979, 179.
- ⁴ Allais 1993, 114.
- ⁵ Hodge 1992, 342-343.
- ⁶ Ward-Perkins 1994, 69.
- ⁷ Plin. *epist.* 10.32.2; Cassiod. *var.* 3.30.
- ⁸ Rawlinson 1958, 517.
- ⁹ Ben Baaziz 1990, 211-212.
- ¹⁰ Lloyd 1977, 104-105, 132-133, 145.
- ¹¹ Buzaian 1994, 23, 26 and Fig. 16.
- ¹² Cahen 1873, 303 and Pl. VI.
- ¹³ S. Stevens, personal communication.
- ¹⁴ Dureau de la Malle, 1835, 193 and Pl. III.
- ¹⁵ Broise/Thébert 1993, 43-44, 46-47 Figs 65-68.
- ¹⁶ See Parslow, this volume, for periodic flushing at Pompeii.
- ¹⁷ Hodge 1992, 271 and 454 n. 77.
- ¹⁸ Wilson 1995; Wilson 1997, 159-168.
- ¹⁹ Lohmann 1979, 170 Abb. 2, 173-174, 182, and 183 Abb. 15.
- ²⁰ Wilson 1995.
- ²¹ Thouvenot 1954, 53-54.
- ²² Scobie 1986, 413-415; Jansen 1991, 156 (existence of cesspits at Herculaneum deduced from inscription); Koloski-Ostrow 1995.
- ²³ Lloyd 1977, 193.
- ²⁴ Scobie 1986, 414.
- ²⁵ Fuhrmann 1941, 367-370; Scrinari, 1972, no. 604; see Scobie 1986, 417 nn. 135-136.
- ²⁶ Picard 1947, 374-5 = *AE* 1949, 48.
- ²⁷ Lloyd 1977, 151-152 and Pl. XI a.
- ²⁸ Carton 1911.
- ²⁹ Scobie 1986, 415; Taylor 1935, 213.
- ³⁰ Lloyd 1977, 99-100; Barker 1979, 37-38.

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